

SUMMARY OF EXHAUST SYSTEM CONFIGURATION:

Engine Selection: perkins                      Manufacturer: perkins  
Application: generator                      Model: E14TAG3  
Brake horsepower:        0.0                      Electrical power: 400.0  
Allowable backpressure: 27.3                      Design backpressure:    0.0  
BEMP:    0.0                      RPM: 1800                      Exhaust Temp:    70.0  
Exhaust Flow: 3226.0                      Outlet dia:    6.0                      # of outlets:    1  
Outlet Configuration: Engine Flange

Silex Silencer Selection:

- 1) JBT-10-ST Crit. LPD 寧靜型低背壓消音器

Piping System Details:

- 1) Elbow:    [dia=6.0", angle=90 deg]    6英吋 90°彎頭一只  
2) Elbow:    [dia=12.0", angle=90 deg] 12 英吋 90°彎頭三只  
3) Elbow:    [dia=12.0", angle=90 deg]  
4) Elbow:    [dia=12.0", angle=90 deg]  
5) Piping Segment:    [dia=12.0", len=360.0'] 12英吋管,管長110米

SYSTEM ACOUSTICS

Octave Band and dBA Engine Sound Pressure Levels  
[dB] @ 3.0' & 90 deg to exhaust axis:

| Frequency [Hz] | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA                 |
|----------------|-----|-----|-----|-----|------|------|------|------|---------------------|
| perkins:       | 119 | 125 | 121 | 112 | 108  | 101  | 91   | 83   | <u>116 引擎排氣原始噪音</u> |

Octave Band Silencer Insertion Loss Data:

| Frequency [Hz]       | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|----------------------|----|-----|-----|-----|------|------|------|------|
| JBT-10-ST Crit. LPD: | 4  | 12  | 27  | 27  | 20   | 14   | 12   | 10   |

Overall Silencer System Noise Reduction: 18 dBA 消音器可減去噪音

Octave Band Piping System Noise Reduction Data [dB]:

| Frequency [Hz]  | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------|----|-----|-----|-----|------|------|------|------|
| Elbow:          | 0  | 0   | 0   | 0   | 1    | 2    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Piping Segment: | 90 | 90  | 90  | 90  | 90   | 90   | 90   | 90   |

Overall Piping System Noise Reduction: 90 dBA 管路可減去噪音

Octave Band and dBA Sound Data at Receiver [dB]:

Distance to acoustical receiver: 3.0'  
Angle between receiver and axis of exhaust outlet: 90.0 degrees

| Frequency [Hz]        | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------------|----|-----|-----|-----|------|------|------|------|
| Distance Attenuation: | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |
| Air Absorption:       | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |
| Directivity:          | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |

Overall Noise Reduction between Outlet and Receiver: 0 dBA

Sound Pressure Levels at Receiver [dB]:

|                 |    |     |     |     |      |      |      |      |     |                     |
|-----------------|----|-----|-----|-----|------|------|------|------|-----|---------------------|
| Frequency [Hz]  | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBa | 400KW               |
| Receiver Level: | 25 | 23  | 4   | -8  | -9   | -14  | -23  | -29  | 8   | <u>排氣尾端一米處所測得噪音</u> |

SYSTEM PRESSURE DATA:

Pressure Data Through Silencer

|                      |                    |                        |                               |                 |
|----------------------|--------------------|------------------------|-------------------------------|-----------------|
|                      | Flow Rate<br>[CFM] | Face Velocity<br>[FPM] | Presssure Drop<br>[inches WG] |                 |
| JBT-10-ST Crit. LPD: | 3226.0             | 5914.8                 | 0.5                           | <u>消音器所產生壓損</u> |

Pressure Data Through Piping Systems

|                 |                    |                        |                               |  |
|-----------------|--------------------|------------------------|-------------------------------|--|
|                 | Flow Rate<br>[CFM] | Face Velocity<br>[FPM] | Presssure Drop<br>[inches WG] |  |
| Elbow:          | 3226.0             | 16429.9                | 3.7                           |  |
| Elbow:          | 3226.0             | 4107.5                 | 0.2                           |  |
| Elbow:          | 3226.0             | 4107.5                 | 0.2                           |  |
| Elbow:          | 3226.0             | 4107.5                 | 0.2                           |  |
| Piping Segment: | 3226.0             | 4107.5                 | 6.3                           |  |

Total pressure drop through piping system: 10.7 inches WG. 管路壓損

Total Back-pressure on Engine = 11.3 inches WG. 系統總壓損

SUMMARY OF EXHAUST SYSTEM CONFIGURATION:

Engine Selection: perkins                      Manufacturer: perkins  
Application: generator                      Model: E15TAG3  
Brake horsepower:        0.0                      Electrical power: 500.0  
Allowable backpressure: 27.3                      Design backpressure:    0.0  
BEMP:    0.0            RPM: 1800            Exhaust Temp:    70.0  
Exhaust Flow: 4225.0                      Outlet dia:    6.0                      # of outlets: 1  
Outlet Configuration: Engine Flange

Silex Silencer Selection:

- 1) JBT-10-ST Crit. LPD    寧靜型低背壓消音器

Piping System Details:

- 1) Elbow:    [dia=6.0", angle=90 deg]    6英吋 90°彎頭一只  
2) Elbow:    [dia=14.0", angle=90 deg] 14英吋 90°彎頭三只  
3) Elbow:    [dia=14.0", angle=90 deg]  
4) Elbow:    [dia=14.0", angle=90 deg]  
5) Piping Segment:    [dia=14.0", len=360.0'] 14英吋管,管長110米

SYSTEM ACOUSTICS

Octave Band and dBA Engine Sound Pressure Levels  
[dB] @ 3.0' & 90 deg to exhaust axis:

| Frequency [Hz] | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA                 |
|----------------|-----|-----|-----|-----|------|------|------|------|---------------------|
| perkins:       | 119 | 125 | 121 | 112 | 108  | 101  | 91   | 83   | <u>116</u> 引擎排氣原始噪音 |

Octave Band Silencer Insertion Loss Data:

| Frequency [Hz]       | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|----------------------|----|-----|-----|-----|------|------|------|------|
| JBT-10-ST Crit. LPD: | 4  | 12  | 27  | 27  | 20   | 14   | 12   | 10   |

Overall Silencer System Noise Reduction: 18 dBA    消音器可減去噪音

Octave Band Piping System Noise Reduction Data [dB]:

| Frequency [Hz]  | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------|----|-----|-----|-----|------|------|------|------|
| Elbow:          | 0  | 0   | 0   | 0   | 1    | 2    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Piping Segment: | 90 | 90  | 90  | 90  | 90   | 90   | 90   | 90   |

Overall Piping System Noise Reduction: 90 dBA    管路可減去噪音

Octave Band and dBA Sound Data at Receiver [dB]:

Distance to acoustical receiver: 3.0'  
Angle between receiver and axis of exhaust outlet: 90.0 degrees

| Frequency [Hz]        | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------------|----|-----|-----|-----|------|------|------|------|
| Distance Attenuation: | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |
| Air Absorption:       | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |
| Directivity:          | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |

Overall Noise Reduction between Outlet and Receiver: 0 dBA

Sound Pressure Levels at Receiver [dB]:

|                 |    |     |     |     |      |      |      |      |     |                     |
|-----------------|----|-----|-----|-----|------|------|------|------|-----|---------------------|
| Frequency [Hz]  | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBa | 500KW               |
| Receiver Level: | 25 | 23  | 4   | -8  | -9   | -14  | -23  | -29  | 8   | <u>排氣尾端一米處所測得噪音</u> |

SYSTEM PRESSURE DATA:

Pressure Data Through Silencer

|                      | Flow Rate<br>[CFM] | Face Velocity<br>[FPM] | Presssure Drop<br>[inches WG] |                 |
|----------------------|--------------------|------------------------|-------------------------------|-----------------|
| JBT-10-ST Crit. LPD: | 4225.0             | 7746.4                 | 0.9                           | <u>消音器所產生壓損</u> |

Pressure Data Through Piping Systems

|  | Flow Rate<br>[CFM] | Face Velocity<br>[FPM] | Presssure Drop<br>[inches WG] |  |
|--|--------------------|------------------------|-------------------------------|--|
| Elbow:   | 4225.0             | 21517.8                | 6.3                           |  |
| Elbow:   | 4225.0             | 3952.2                 | 0.2                           |  |
| Elbow:   | 4225.0             | 3952.2                 | 0.2                           |  |
| Elbow:   | 4225.0             | 3952.2                 | 0.2                           |  |
| Piping Segment:  | 4225.0             | 3952.2                 | 4.8                           |  |
| Total pressure drop through piping system: <u>11.8 inches WG. 管路壓損</u> |                    |                        |                               |  |

Total Back-pressure on Engine = 12.8 inches WG. 系統總壓損

SUMMARY OF EXHAUST SYSTEM CONFIGURATION:

Engine Selection: perkins                      Manufacturer: PERKINS  
Application: generator                      Model: E18TAG3  
Brake horsepower:        0.0                      Electrical power: 600.0  
Allowable backpressure: 27.3                      Design backpressure: 0.0  
BEMP: 0.0        RPM: 1800        Exhaust Temp: 70.0  
Exhaust Flow: 5070.0                      Outlet dia: 8.0                      # of outlets: 1  
Outlet Configuration: Engine Flange

Silex Silencer Selection:

- 1) JBT-10-ST Crit. LPD 寧靜型低背壓消音器

Piping System Details:

- 1) Elbow: [dia=8.0", angle=90 deg] 8英吋 90°彎頭一只  
2) Elbow: [dia=14.0", angle=90 deg] 14英吋 90°彎頭三只  
3) Elbow: [dia=14.0", angle=90 deg]  
4) Elbow: [dia=14.0", angle=90 deg]  
5) Piping Segment: [dia=14.0", len=360.0'] 14英吋管,管長110米

SYSTEM ACOUSTICS

Octave Band and dBA Engine Sound Pressure Levels  
[dB] @ 3.0' & 90 deg to exhaust axis:

| Frequency [Hz] | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA                 |
|----------------|-----|-----|-----|-----|------|------|------|------|---------------------|
| perkins:       | 119 | 125 | 121 | 112 | 108  | 101  | 91   | 83   | <u>116 引擎排氣原始噪音</u> |

Octave Band Silencer Insertion Loss Data:

| Frequency [Hz]       | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|----------------------|----|-----|-----|-----|------|------|------|------|
| JBT-10-ST Crit. LPD: | 4  | 12  | 27  | 27  | 20   | 14   | 12   | 10   |

Overall Silencer System Noise Reduction: 18 dBA 消音器可減去噪音

Octave Band Piping System Noise Reduction Data [dB]:

| Frequency [Hz]  | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------|----|-----|-----|-----|------|------|------|------|
| Elbow:          | 0  | 0   | 0   | 0   | 1    | 2    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Elbow:          | 0  | 0   | 0   | 1   | 2    | 3    | 3    | 3    |
| Piping Segment: | 90 | 90  | 90  | 90  | 90   | 90   | 90   | 90   |

Overall Piping System Noise Reduction: 90 dBA 管路可減去噪音

Octave Band and dBA Sound Data at Receiver [dB]:

Distance to acoustical receiver: 3.0'  
Angle between receiver and axis of exhaust outlet: 90.0 degrees

| Frequency [Hz]        | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------------|----|-----|-----|-----|------|------|------|------|
| Distance Attenuation: | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |
| Air Absorption:       | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |
| Directivity:          | 0  | 0   | 0   | 0   | 0    | 0    | 0    | 0    |

Overall Noise Reduction between Outlet and Receiver: 0 dBA

Sound Pressure Levels at Receiver [dB]:

|                 |    |     |     |     |      |      |      |      |       |                     |
|-----------------|----|-----|-----|-----|------|------|------|------|-------|---------------------|
| Frequency [Hz]  | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dB(A) | 600KW               |
| Receiver Level: | 25 | 23  | 4   | -8  | -9   | -14  | -23  | -29  | 8     | <u>排氣尾端一米處所測得噪音</u> |

SYSTEM PRESSURE DATA:

Pressure Data Through Silencer

|                      |                    |                        |                               |                 |
|----------------------|--------------------|------------------------|-------------------------------|-----------------|
|                      | Flow Rate<br>[CFM] | Face Velocity<br>[FPM] | Presssure Drop<br>[inches WG] |                 |
| JBT-10-ST Crit. LPD: | 5070.0             | 9295.7                 | 1.3                           | <u>消音器所產生壓損</u> |

Pressure Data Through Piping Systems

|  |                    |                        |                               |  |
|--|--------------------|------------------------|-------------------------------|--|
|  | Flow Rate<br>[CFM] | Face Velocity<br>[FPM] | Presssure Drop<br>[inches WG] |  |
| Elbow:   | 5070.0             | 14524.5                | 2.9                           |  |
| Elbow:   | 5070.0             | 4742.7                 | 0.3                           |  |
| Elbow:   | 5070.0             | 4742.7                 | 0.3                           |  |
| Elbow:   | 5070.0             | 4742.7                 | 0.3                           |  |
| Piping Segment:  | 5070.0             | 4742.7                 | 7.0                           |  |
| Total pressure drop through piping system: <u>10.8 inches WG. 管路壓損</u> |                    |                        |                               |  |

Total Back-pressure on Engine = 12.1 inches WG. 系統總壓損

To 張先生

## PERKINS 400KW 引擎

最大容許背壓 27.3 in-water

選用 Selix 消音器 JBT-10-ST

排氣管路放大至 12 英吋，以免管路過常導致背壓過高

使用 6 英吋 90 度彎頭 1 個，12 英吋 90 度彎頭 3 個

12 英吋排氣管路總長 110 米(地下 100 米+地上 10 米)

以此配置排氣出口噪音值 8dBA，總排氣背壓值 11.3 in-water

## PERKINS 500KW 引擎

最大容許背壓 27.3 in-water

選用 Selix 消音器 JBT-10-ST

排氣管路放大至 14 英吋，以免管路過常導致背壓過高

使用 6 英吋 90 度彎頭 1 個，14 英吋 90 度彎頭 3 個

12 英吋排氣管路總長 110 米(地下 100 米+地上 10 米)

以此配置排氣出口噪音值，總排氣背壓值 12.8 in-water

## PERKINS 600KW 引擎

最大容許背壓 27.3 in-water

選用 Selix 消音器 JBT-10-ST

排氣管路放大至 14 英吋，避免管路過常導致背壓過高

使用 8 英吋 90 度彎頭 1 個，14 英吋 90 度彎頭 3 個

英吋排氣管路總長 110 米(地下 100 米+地上 10 米)

以此配置排氣出口噪音值 8dBA，總排氣背壓值 12.1 in-water



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