SELECTION PROCEDURE
A 630mm axial flow fan (AP Series) running at 24 rev/sec, Type D installation (fully ducted) to give a duty of 3.5m³/s at 180 Pa static pressure.

1. Air flow 3.5m³/s
2. Static pressure is 180 Pa; no correction is required as the curves are plotted for Type D installation.
3. Blade angle setting = 25°
   Full impeller code = 0634/10/25°
4. Fan impeller power, \( P_n = 1.33 \) kW
   Recommended motor power = 1.5 kW
   Motor frame size is D90L
   See pages J-2/3 for details of these motors.
5. Fan total efficiency
   \[ \frac{q_v \times P_T}{10P_a} = \frac{3.5 \times (180 + 75)}{10 \times 1.33} = 67.1\% \]
   where:
   \( q_v \) = volume flow, m³/s
   \( P_T \) = fan total pressure, Pa
   \( P_n \) = fan impeller power, kW
6. Outlet side in-duct sound power level, \( L_w = 90 \) dB (by interpolation)
7. Relevant sound zone 5
8. From the sound data table using zone 5 inlet side in-duct data
9. Total sound power level correction value for fan inlet= 0dB
   Hence total sound power, \( L_w = 90 \)dB
10. Octave band spectra correction values
    | Hz  | 63  | 125 | 250 | 500 | 1k  | 2k  | 4k  | 8k  |
    |----|-----|-----|-----|-----|-----|-----|-----|-----|
    | 6  | 84  | 75  | 82  | 81  | 83  | 80  | 79  | 71  |
    | *  | 6   | 15  | 8   | 9   | 7   | 10  | 11  | 19  |
    *Correction values are negative unless shown otherwise and are subtracted from the Total Sound Power.
   Correction value to Sound Pressure at 3m is 21dB, (see Ref. i and Fig. 7 on Page G-27) therefore:
   Total sound pressure level \( L_P \) at 3m = 90 - 21 = 69dB.
   Octave band spectra correction values as for step 10 at 3m:
    | Hz  | 63  | 125 | 250 | 500 | 1k  | 2k  | 4k  | 8k  |
    |----|-----|-----|-----|-----|-----|-----|-----|-----|
    | L_PdB | 63  | 55  | 61  | 60  | 62  | 59  | 58  | 50  |
11. Correction value from dB at 3m to dB(A) at 3m = -3
    Total dB(A) level at 3m = 69 - 3 = 66dB.
    Similar sound data could have been deduced for the outlet side in-duct or inlet and outlet free field levels from the data shown in the Sound Data table.
12. If a selection for the same fan and duty had been required for a Type A installation, then the static pressure would have to be corrected as follows.
    Relative pressure loss = +35 Pa
13. Revised static pressure for curve selection purposes
    = 180 + 35
    = 215 Pa.
   This would result in a fan selection at 27°, an impeller power of 1.54kW, an outlet side in-duct total noise level of 91dB and the duty point moving into zone 2.