

## ACES-TROX Training Course 'Air-Side Fundamentals' in ACMV Engineering

**9 x Lessons; Duration: 1.5 hours per Lesson**

**Online Training – 8.00 pm to 9.30 pm**

Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Lesson 7	Lesson 8	Lesson 9
17 May (Tue)	24 May (Tue)	31 May (Tue)	7 June (Tue)	10 June (Fri)	17 June (Fri)	28 June (Tue)	5 July (Tue)	8 July (Fri)

**Mode of Delivery:** Online via Zoom Meeting

**CPD:** 9 PDU confirmed  
13 STU (M&E) confirmed

**Fee:** \$120 for ACES Member  
\$150 for M&E RE/RTO  
\$200 for Non-member

Register in advance for this meeting:

<https://us02web.zoom.us/join/zoom/register/tZAlcOqtgzMpEtABVHloqD6TUnKGeCte8oCx>



After registering, you will receive a confirmation email containing information about joining the meeting

### COURSE OBJECTIVES

1. To provide training programs (on-line) for graduates and practicing engineers in the ACMV industry who need to either extend or update their knowledge on a particular subject(s) in accordance with current developments in the industry.
2. The training programs are designed to cater for the needs of young graduates, practicing technicians and engineers to provide a better understanding of certain fundamentals as listed in this series of courses.
3. To provide joint training programs with recognised engineering and/or training institutions in the Asia Pacific region.
4. The course is designed to be a flexible, to allow the potential participants to choose either to sign up for the entire series of lessons in the 'Fundamentals' module or select the relevant subject(s) of interest as required.
5. The contents for each lesson is given below as a guide to show what can be expected in the training under each subject.
6. The presentation for each lesson is expected to take 1 hour and 30 minutes including tests and assignments to be completed by the participants and assessed by the trainer. Each participant is also expected to complete five test questions and at least two discussions of their choice, which they can select from a list of five discussion questions.

## COURSE CONTENTS

### Fundamentals:

This will include fundamental engineering concepts that are relevant to the ACMV industry. This caters largely for young graduates and those who does not have the necessary formal training in the subject or simply as refresher course to update knowledge. The contents for each of the courses are detailed below:

- i. **Lesson 1 - Thermal Comfort**  
Content: Terminologies for thermal comfort; Air movement; Indoor Air Quality (IAQ); Outdoor air requirements; Introduction to mechanical ventilation; Importance of good ventilation.
- ii. **Lesson 2 - Air Distribution**  
Content: Terminologies for air distribution; Importance of good air distribution; Type of air terminal devices; Factors affecting air distribution; Air Distribution Performance Index (ADPI); Commissioning of ACMV systems; Air flow measurement at site.
- iii. **Lesson 3 - Duct Design**  
Content: Ductwork construction standards; Duct sizing methods; Ductwork installation; Final duct connections; Ductwork insulation; Access and measuring stations.
- iv. **Lesson 4 – Fans**  
Content: Types of fan; Fan Laws; Fan curve and system characteristic curve; Fan selection; Fans in series and parallel arrangement; Air flow and fan speed control; Fan installation.
- v. **Lesson 5 – Psychometrics**  
Content: Properties of air; Application of psychometric chart; Understanding psychometric processes; Work examples.
- vi. **Lesson 6 - Building Science**  
Content: External building factors; Building envelope; Building structure; Building layout and Building design drawings.
- vii. **Lesson 7 – Acoustics for ACMV systems**  
Content: Terminologies for acoustics; A-weighting; Noise Criteria (NC) and Noise Rating (NR); Combination of noise levels; Total sound field; Noise reduction with distance; Noise measurement at site.
- viii. **Lesson 8 - Fire safety in buildings**  
Content: Triangle of fire; Stages of fire development; Fire safety strategies; Means of escape; Smoke control; Fire protection systems.
- ix. **Lesson 9 - Commissioning of ACMV systems**  
Content: Objectives for commissioning; Setting to work; Measurement of air flow rates; regulation for air flow; Commissioning documentation.

## CERTIFICATION

- **E-Certificate of Attendance** will be issued to participant with at least 75% attendance.

## TRAINER



### Kenneth Gong

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#### Academic Qualifications:

BSc Degree in Building Services Engineering (Northumbria University, UK), 1987.  
Diploma in Acoustic and Noise Control (Institute of Acoustics, UK), 1989.  
Certificate in Quality Management (Institute of Quality Assurance, UK), 1989.  
Master of Business Administration (Maastricht School of Management, Netherlands), 2009

Kenneth is a qualified Chartered Building Services Engineer with more than 30 years working experience in the building services industry. After completion of his first degree, he started his career in the UK as a M & E Design Consultant for a period of 10 years before he returned to Malaysia in 1997.

Upon his return, he joined TROX Malaysia Sdn. Bhd., a multi-national manufacturer of air-conditioning components and systems. He is responsible for product research and development, product testing and certification and technical support and training.

## TRAINING PROGRAMMES:

<b>8.00 to 9.30 pm</b>	<b>Topics covered</b>
<b>17 May 2022 (Tue)</b>	<b>Lesson 1</b> - Thermal Comfort; Content: Terminologies for thermal comfort; Air movement; Indoor Air Quality (IAQ); Outdoor air requirements; Introduction to mechanical ventilation; Importance of good ventilation.
<b>24 May 2022 (Tue)</b>	<b>Lesson 2</b> - Air Distribution; Content: Terminologies for air distribution; Importance of good air distribution; Type of air terminal devices; Factors affecting air distribution; Air Distribution Performance Index (ADPI); Commissioning of ACMV systems; Air flow measurement at site.
<b>31 May 2022 (Tue)</b>	<b>Lesson 3</b> - Duct Design; Content: Ductwork construction standards; Duct sizing methods; Ductwork installation; Final duct connections; Ductwork insulation; Access and measuring stations.
<b>7 June 2022 (Tue)</b>	<b>Lesson 4</b> – Fans; Content: Types of fan; Fan Laws; Fan curve and system characteristic curve; Fan selection; Fans in series and parallel arrangement; Air flow and fan speed control; Fan installation.
<b>10 June 2022 (Fri)</b>	<b>Lesson 5</b> – Psychometrics; Content: Properties of air; Application of psychometric chart; Understanding psychometric processes; Work examples.
<b>17 June 2022 (Fri)</b>	<b>Lesson 6</b> - Building Science Content: External building factors; Building envelope; Building structure; Building layout and Building design drawings.
<b>28 June 2022 (Tue)</b>	<b>Lesson 7</b> – Acoustics for ACMV systems; Content: Terminologies for acoustics; A-weighting; Noise Criteria (NC) and Noise Rating (NR); Combination of noise levels; Total sound field; Noise reduction with distance; Noise measurement at site.
<b>5 July 2022 (Tue)</b>	<b>Lesson 8</b> - Fire safety in buildings; Content: Triangle of fire; Stages of fire development; Fire safety strategies; Means of escape; Smoke control; Fire protection systems.
<b>8 July 2022 (Fri)</b>	<b>Lesson 9</b> - Commissioning of ACMV systems; Content: Objectives for commissioning; Setting to work; Measurement of air flow rates; regulation for air flow; Commissioning documentation