

4	ENERGY USE	4.3 ENERGY EFFICIENT EQUIPMENT	
		EU 7 AIR-CONDITIONING UNITS	
	EXCLUSIONS	Buildings not using window and/or split-type air-conditioners.	
	OBJECTIVE	Ensure the installation of air-conditioning units provides for near optimum performance.	
	CREDITS ATTAINABLE	1	
	PREREQUISITES	Proper disposal system for the drainage of the condensation shall be provided in accordance with Buildings Department requirements [1].	
	CREDIT REQUIREMENT	1 credit for complying with the recommended installation positions for air-conditioning units with regard to internal spaces; complying with the minimum width of any external recess with regard to heat rejection; and complying with the items listed in the assessment checklists.	
	ASSESSMENT	<p>i) Window type air-conditioning units</p> <p>The Client shall provide relevant drawings and specifications demonstrating that the air-conditioning units installed comply with the installation requirements given in Tables 8.4 and 8.5 in Section 8.4.</p> <p>ii) Split-type air-conditioning units</p> <p>The Client shall provide relevant drawings and specifications demonstrating that the air-conditioning units installed comply with the relevant dimensions given in Table 8.4 in respect of internal unit, and with the relevant dimensions given in Table 8.5 in respect of the external unit.</p> <p>Compliance with the requirements shall be demonstrated for each type of domestic unit in a block, or each type of space or room in other types of premises, unless the Client can demonstrate either that circumstances mitigate against compliance in not more than 10% of installations, or that non-compliance will not affect the performance of air-conditioning units in respect of room cooling, or heat rejection.</p> <p>The Client shall confirm that the installation conforms with any four of the following items that are relevant to the type of air-conditioning units used:</p> <ul style="list-style-type: none">• to reduce penetration of noise units shall be located on walls which do not face major noise sources (road traffic, major pedestrian walkways, playgrounds, etc);• to reduce intake of polluted air units shall be located in walls such that air is not drawn in from pollution sources such as roads, commercial activities, etc;• for improved acoustics properties and better circulation, the internal discharge shall be close to the centre of the wall in which it is located;• for the purpose of reducing noise from rain, and to reduce the potential for water dripping on to lower units, slabs shall be provided as support and as cover;• to encourage proper maintenance, the installation of units shall be such as to allow for safe and convenient removal;• where air-conditioning units are provided by the developer, the units	

1 Buildings Department. Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers. PNAP No. APP-112 Disposal of Condensation from Air-Conditioning Units. <http://www.bd.gov.hk/english/documents/pnap/APP/APP112.pdf>

selected shall be labelled as Grade 1 or 2 under the Government's energy efficiency labelling scheme for room coolers [2].

BACKGROUND

Due to the hot and humid weather, the majority of residential units in Hong Kong are equipped with window-type air-conditioners. However, the provisions made in the building envelope design for their installation are often inadequate, particularly in the clearances for intake and disposal of outdoor air for condenser cooling. Consequently, the air-conditioners would consume an unnecessarily high amount of electricity and at the same time output less cooling [3].

Proper location of air-conditioning units will improve internal operating efficiency and comfort, and the efficiency of external heat rejection. Good design of openings can improve the quality of air intake, reduce intrusion of external noise, reduce nuisance to neighbours and provide for better operation and maintenance.

For air-conditioning for residential buildings, wall boxes or platforms in reinforced concrete or other suitable material may be constructed as a permanent feature, even over streets, and as such may be excluded from site coverage considerations [4].

- 2 Electrical & Mechanical Services Department, the Government of the Hong Kong SAR. The Hong Kong Voluntary Energy Efficiency Labelling Scheme for Room Coolers.
[http://www.emsd.gov.hk/emsd/e_download/pee/eels_room_cooler_\(jan_2003\).pdf](http://www.emsd.gov.hk/emsd/e_download/pee/eels_room_cooler_(jan_2003).pdf)
- 3 Bojic M, Lee M, Yik F, Burnett J. Influence of clearances on the energy performance of window-type air-conditioners at the same level outside residential buildings. *Building and Environment* 37 (2002) 713 – 726
- 4 Buildings Department. Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers. PNAP No. APP-42 Amenity Features.
<http://www.bd.gov.hk/english/documents/pnap/APP/APP042.pdf>

#62. EU 7, Is table 8.7 at EU 7 applicable to outdoor units of split-type air-conditioning units?

All dimensions specified in Table 8.7 in current BEAM Plus Ver. 1.1 and should be applicable to the outdoor units of split-type air-conditioning units except dimension J and K.

#63. EU 7, For BEAM Plus NB V1.1 and 1.2/ EU 6, for BEAM Plus EB V1.1 and 1.2, will this credit be applicable if the project proponent provides a spatial provision to allow window type A/C, split-type A/C or VRF system be installed by future tenants/occupiers?

Yes. The credit is applicable to those projects where the project developer provides a spatial provision to allow window type air-conditioner, split-type air conditioner or VRF system be installed by future tenants/occupiers.

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#64. EU 7, For BEAM Plus New Buildings Version 1.1 and 1.2/ EU 6, for BEAM Plus Existing Buildings Version 1.1 and 1.2, do Variable Refrigerant Flow (VRF) systems need to be included in the assessment of this credit?

Yes. The Applicant shall refer to the manufacturer's recommendation/installation guides and demonstrate the compliance to the dimensional requirement of VRF system for the following components: (i) outdoor condensing units with side discharge, (ii) outdoor condensing units with top discharge and (iii) wall-mount indoor units.

Normally, there are no dimensional requirements for ceiling-mounted indoor units. However, the Applicant shall make the best efforts to demonstrate that the ceiling-mounted indoor units are positioned at the centre of the room for better operating efficiency and comfort.

(Released on 11 September 2019)

#65. EU 7, For BEAM Plus New Buildings Version 1.1 and 1.2/ EU 6, for BEAM Plus Existing Buildings Version 1.1 and 1.2, will this credit be applicable to projects served generally by central air conditioning system?

No. The credit shall not be applicable to projects where the space cooling/heating is served mainly by central air conditioning system.

(Released on 11 September 2019)

EU 9 Energy Efficient Appliances

EU 10 Testing and Commissioning

EU 12 Metering and Monitoring

Water Use

WU P1 Water Quality Survey

WU P2 Minimum Water Saving Performance

WU 1 Annual Water Use

WU 5 Water Efficient Appliances

Indoor Environmental Quality

IEQ P1 Minimum Ventilation Performance

IEQ 1 Security

IEQ 2 Plumbing and Drainage

IEQ 4 Waste Disposal Facilities

IEQ 5 Construction IAQ Management

IEQ 6 Outdoor Sources of Air Pollution

IEQ 7 Indoor Sources of Air Pollution

IEQ 9 Increased Ventilation

IEQ 10 Background Ventilation

IEQ 11 Localised Ventilation

IEQ 12 Ventilation in Common Areas

IEQ 14 Thermal Comfort in Naturally Ventilated Premises

IEQ 15 Natural Lighting