



KANOMAX
The Ultimate Measurements

OPERATION MANUAL

Version 1

Duct Air Leakage Tester Model DALT 6900



Be sure to read this manual thoroughly before using the instrument.

Please keep this manual as a service reference.

Symbols for warning mentioned in this manual are defined below:

Symbols classifications



Danger: To Prevent Serious Injury or Death

Warnings in this classification indicate a danger that may result in serious injury or death if not observed.



Caution: To Prevent Damage to the Product

Warnings in this classification indicate a risk of damage to the product that may void the product warranty if not observed.

Description of Symbols









△ This symbol indicates a condition that requires caution (including danger). The subject of each caution is illustrated inside the triangle.



⊘ This symbol indicates a prohibition. Do not take the prohibited action shown inside or near this symbol.



● This symbol indicates a mandatory action. A specific action is given near the symbol.

 WARNING	
 Heat forbidden	<p>○ Never bring the fabric hood near flammable gas or heat source.</p> <p>… Otherwise, the heat may cause a fire or explosion.</p>
 Disassembly prohibition	<p>○ Do not disassembly or refit the instrument.</p> <p>… Otherwise, it may cause the electric shock or a fire.</p>
 Using properly	<p>○ Use properly under the instruction manual.</p> <p>… Otherwise, it may cause sensor damaged or an electric shock even a fire.</p>
 Using properly	<p>○ If abnormal smells, noises or smoke occur, or if liquid enters the instrument, pull out the AC adapter and remove the batteries immediately. Then send it to the maintenance Dept. of KANOMAX for after service.</p> <p>… Or, there is possible of an electric shock or a fire or instrument malfunction.</p>
 Forbidden	<p>○ Do not expose the fabric hood, base and the instrument to water or rain.</p> <p>… Otherwise, may cause an electric shock, a fire and person injure.</p>

3. Installation and Assembling

According to the testing air flow range, nozzles or Matrix will be optional as the testing tool. And it's applicable to both air blower system and exhaust system of the air conditioning ducts. Generally speaking, take nozzle as the tool for low flow test and take matrix as the tool for the High flow test.

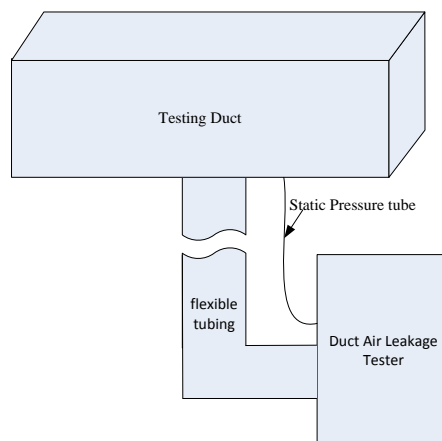
3.1. Testing duct connection

Preparation before testing:

- (1) Refer to Appendix 1. Leakage testing standard for a confirmation of required testing, such as:
 - Leakage standard to be followed;
 - Air tightness / leakage class to be achieved;
 - Testing pressure.
- (2) Temporarily seal all the openings of the ductwork except one, which will be connected to the duct leakage tester. Calculate the area of testing duct surface to ensure it's available and within the input range.

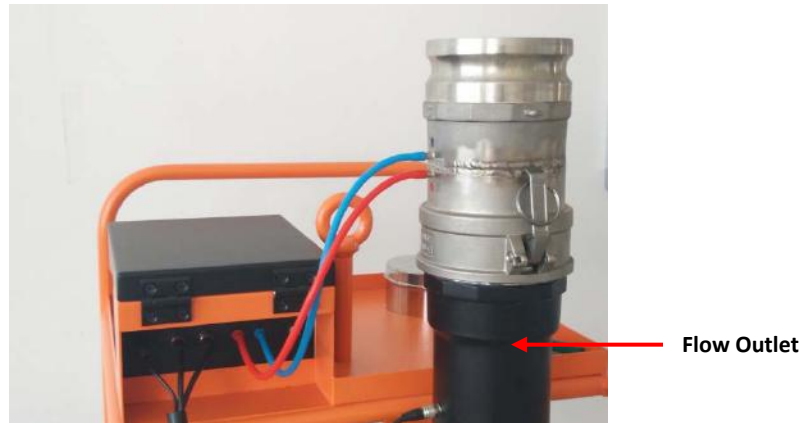
Connect the testing duct to the Tester :

- (1) Position the DALT 6900 unit as close to the remaining opening in the ductwork as possible to minimize the flexible tubing needed. Minimize bends in the flexible tubing to reduce the pressure loss, giving the best performance.
- (2) Fit one end of the flexi-tube with adapter spigot to the 6900. Make an air-tight seal using one of the over lock straps and lever-locking cam provided. Connect the other end with flange to the testing duct required. User need to install and connection with proper way according to the practical situation.
- (3) If the static pressure tapping on the testing duct, connect the static tube as the tapping or drill a $\Phi 6\text{mm}$ hole in the duct and insert the static tube into the duct. Seal around the hole. Connect the other end of the static tube to the Controller cabinet.

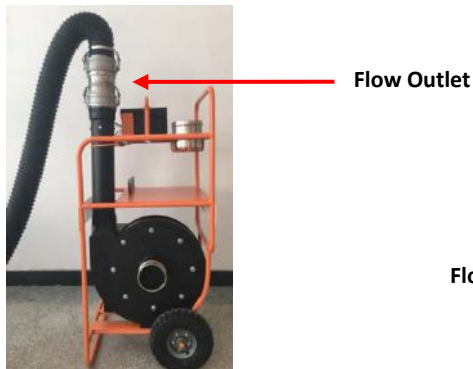


3.3.Low- flow testing

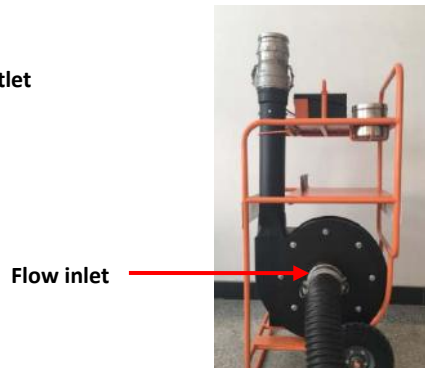
Low- flow testing takes nozzles as the tool for Duct leakage flow measuring. Install the low-flow nozzles to the blower outlet, tight locking the cam lock adaptor. Connect the pressure tap of the nozzle to the Differential pressure flow port of the controller cabinet. And same color hose-tap connection please.



1. **Duct testing under Positive pressure:** Connect the flexible tubing to the flow outlet side of the nozzle then tight lock.
2. **Duct testing under Negative pressure:** Connect the flexible tubing to the flow inlet side of the Fan then tight lock.



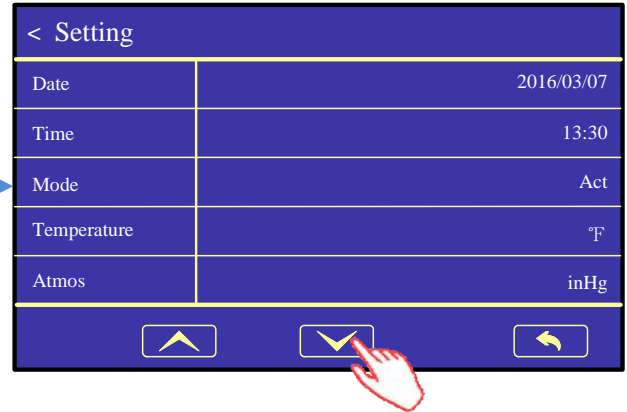
Low-flow Duct testing under positive pressure



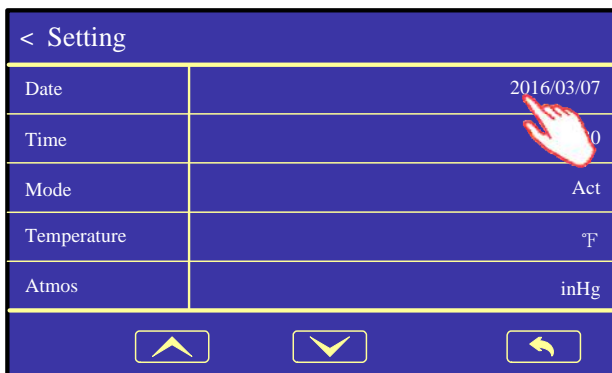
Low-flow Duct testing under Negative pressure

4.4 "Setting" menu

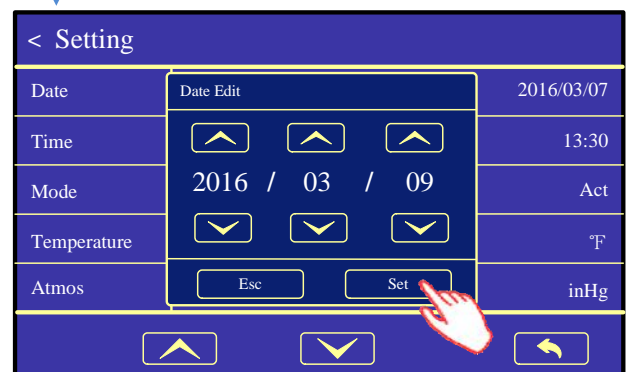
In "Setting" menu, application items include: Date, Time, STD/ACT, Temperature, Atmosphere, Air flow and Static pressure as shown below.



1. Date setting

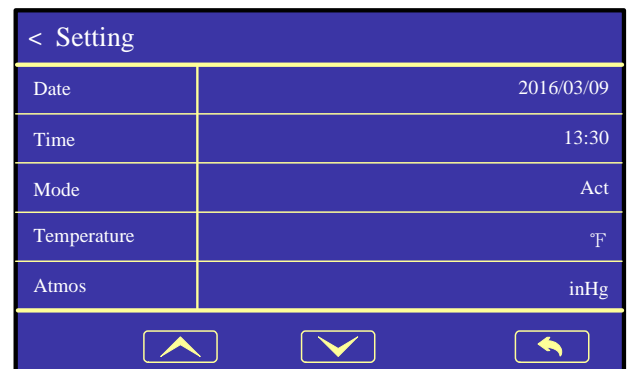
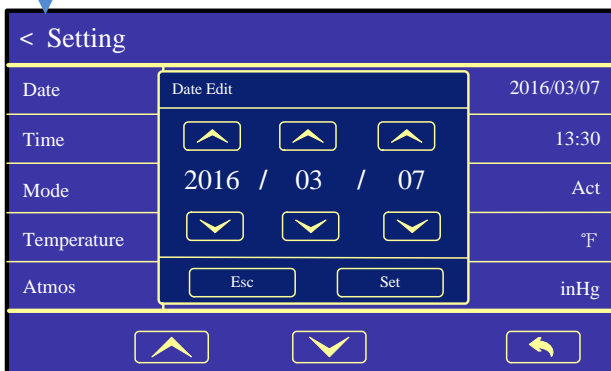


Press or for modifying data.



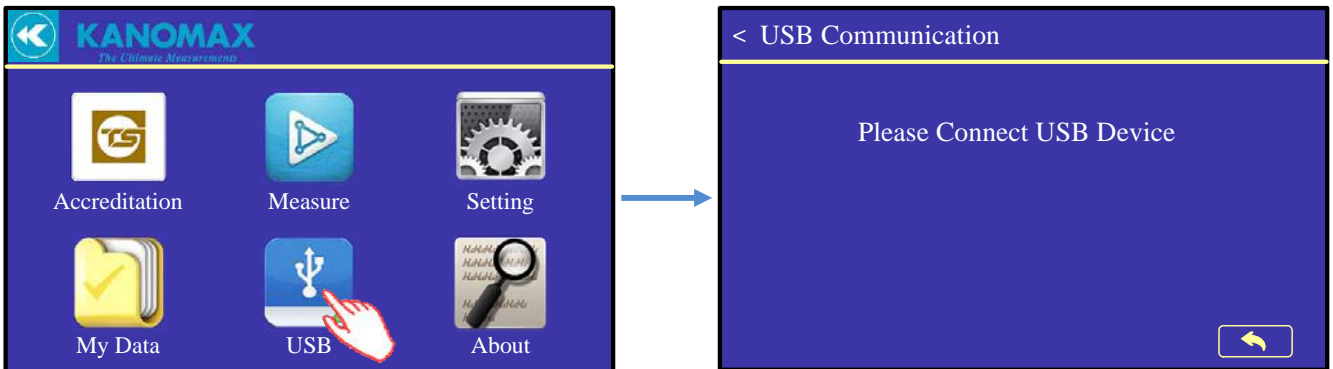
Click for data saving.

Click Date for editing setting

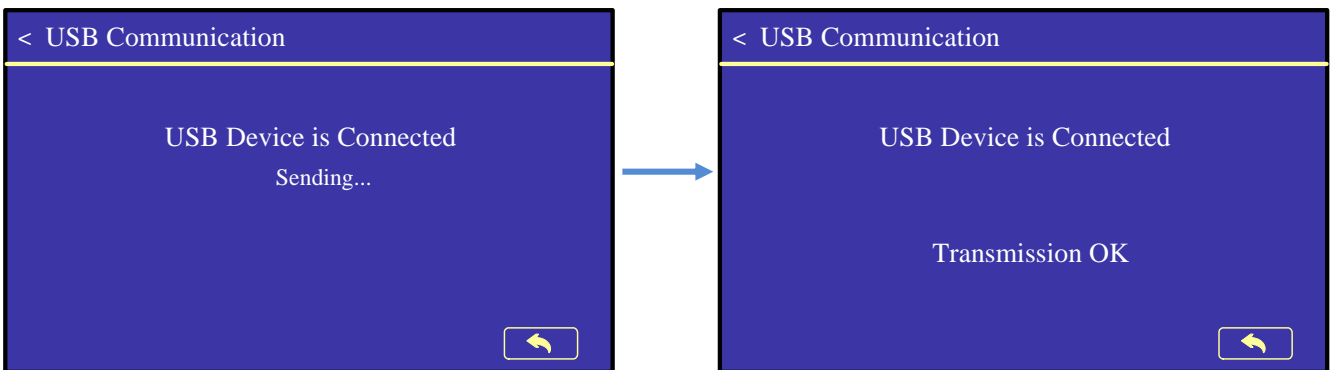


4.6“USB”menu

The data record can be output by USB disk.



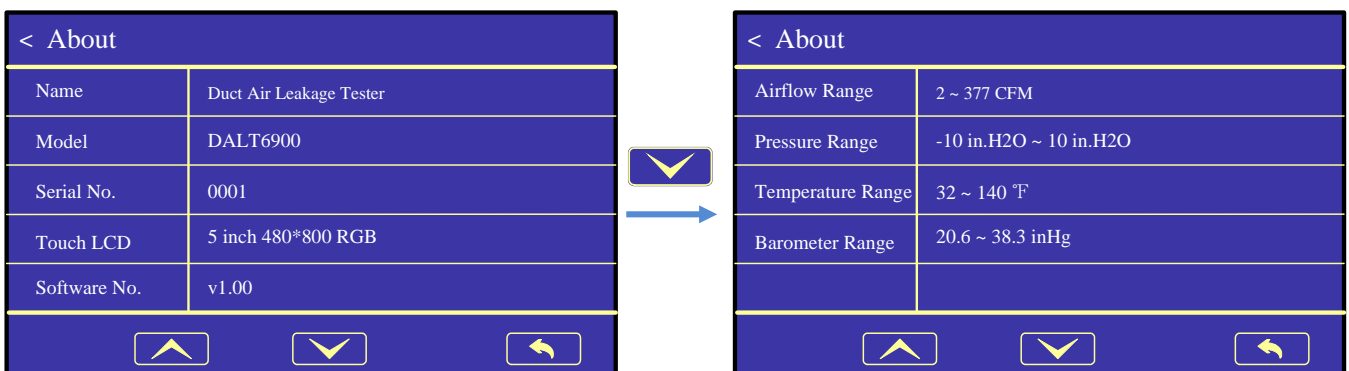
When insert USB disk to USB connector, it will be found by the system and all the saved data will be output.



NOTE: if too many file in USB disk, the time of output will be long. Please clean up the USB disk before data output.

4.7“About” menu

Click “About” for entering the introduction menu, describing the main parameters of the instrument.



C	$\frac{0.003 \times P_t^{0.65}}{1000}$	750	400	1000	2000
D*	$\frac{0.001 \times P_t^{0.65}}{1000}$	750	400	1000	2000

* Class D ductwork is only for special apparatus

3. EU Standards Dw/143

Duct Pressure Class	Static Pressure Limit		Maximum Air Velocity m/s	Air leakage limits l/s/m ²
	Positive Pa	Negative Pa		
Low-pressure – Class A	500	500	10	$0.027 \times P_t^{0.65}$
Medium pressure – Class B	1000	750	20	$0.009 \times P_t^{0.65}$
High pressure – Class C	2000	750	40	$0.003 \times P_t^{0.65}$

4. EU Standards Eurovent 2/2

Air Tightness Class	Air leakage limit (fmax) m ³ /s/m ²
A	$\frac{0.027 \times P_t^{0.65}}{1000}$
B	$\frac{0.009 \times P_t^{0.65}}{1000}$
C	$\frac{0.003 \times P_t^{0.65}}{1000}$

5. US Standards SMACNA

Duct Class	1/2-, 1-, 2-inwg	3-inwg	4-, 6-, 10-inwg
Seal Class	C	B	A
Sealing Applicable	Transverse Joints Only	Transverse Joints and Seams	Joints, Seams and All Wall Penetrations
Leakage Class			
Rectangular Metal	24	12	6
Round Metal	12	6	3

Maximum air leakage is then defined as

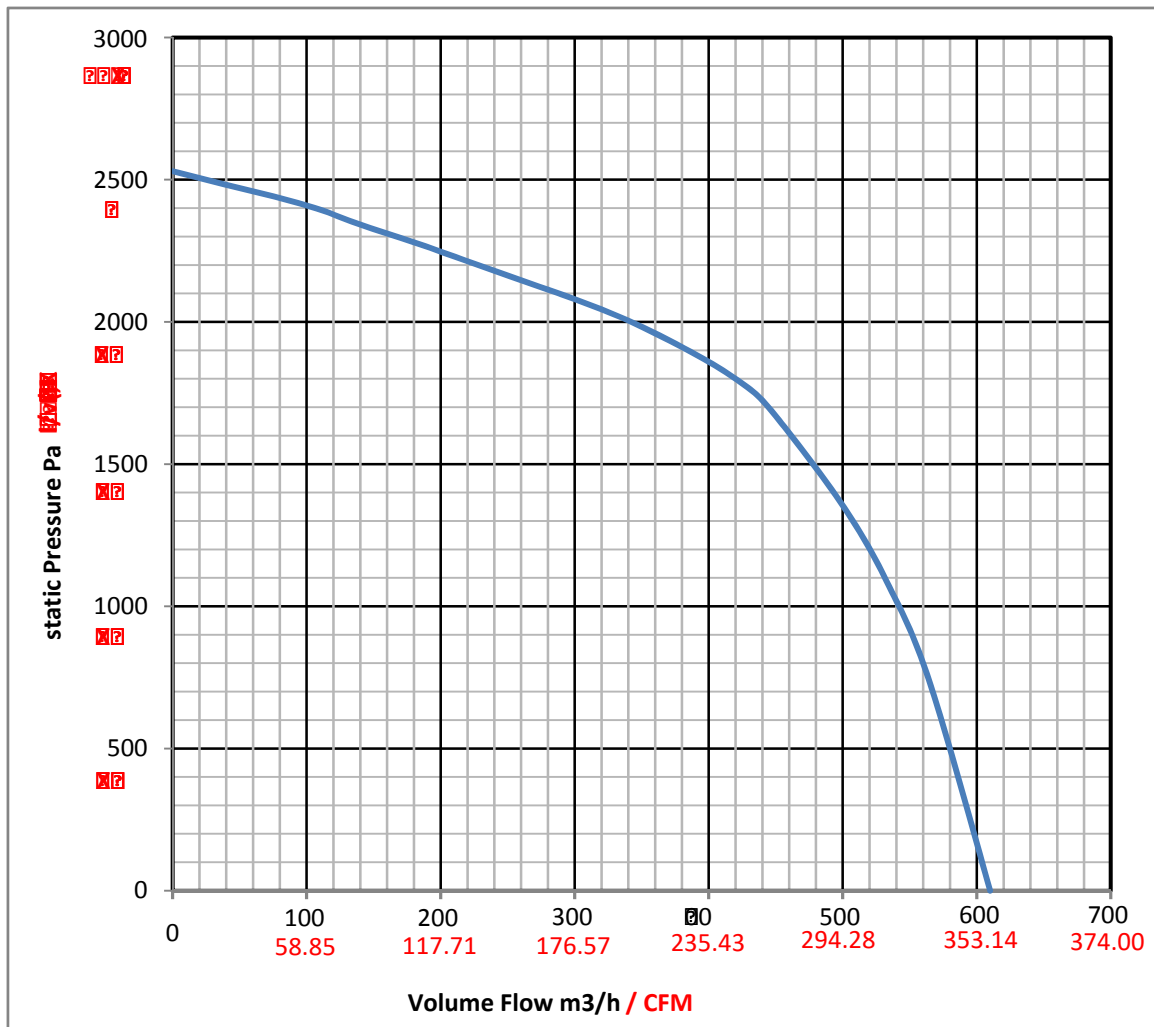
$$F = C_L P^{0.65}$$

F = Maximum air leakage (cfm/100 ft²)

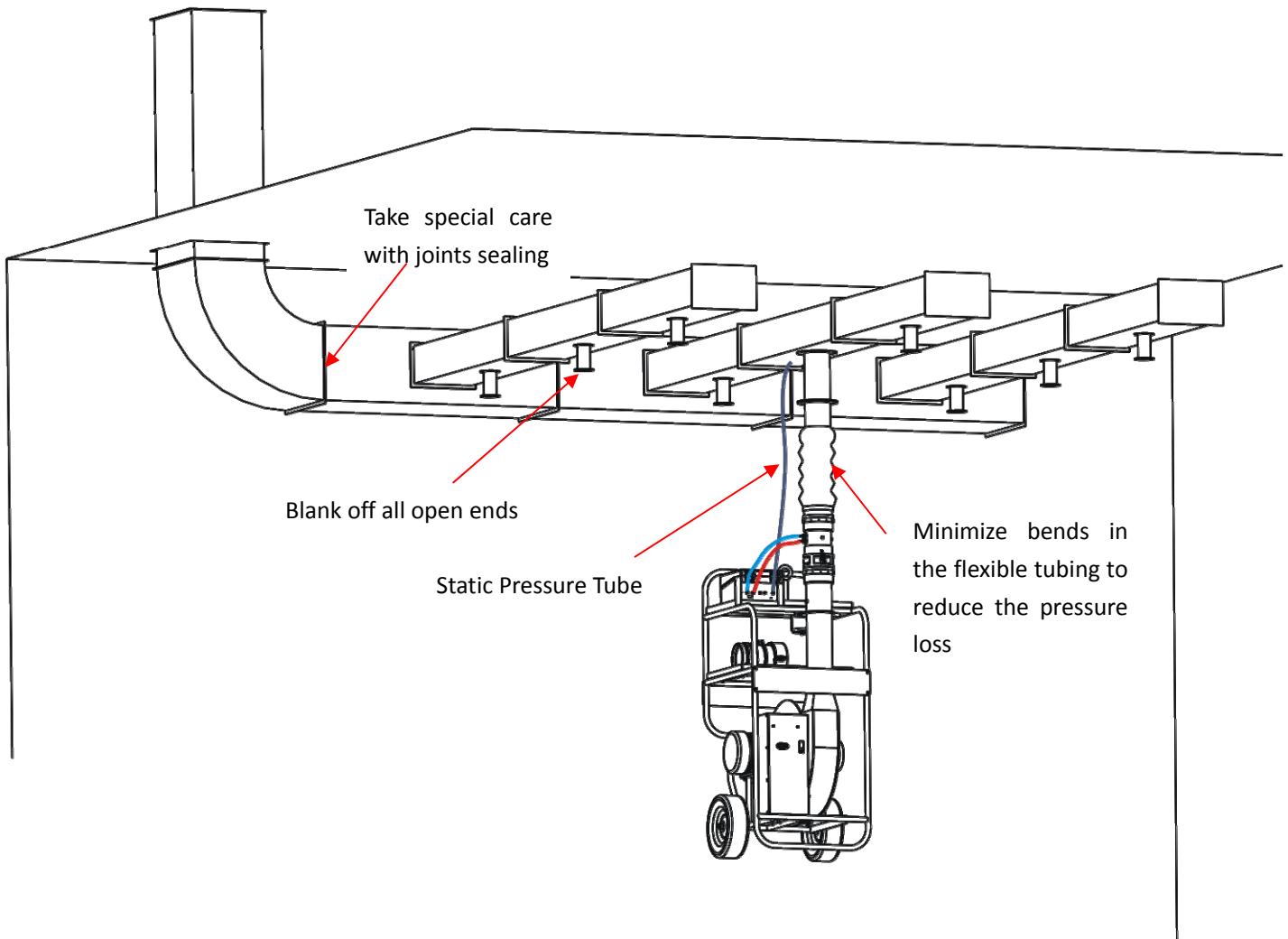
C_L = Leakage class

P = Pressure (inwg)

Appendix 2 Fan Performance Graph



Appendix3 Installation Instruction



How to Find Leaks

1. Look - at blanks, access openings and difficult joints.
2. Listen - with test rig running, leaks should be audible.
3. Feel – running your hand (particularly if wet) over joints can help locate leaks.
4. Soap and Water – paint over joints and look for bubbles.
5. Smoke Pellet – placed inside ductwork (obtain permission for use).

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