Operation Manual

Item #: 151004
Rev Date: 2020-12-15

PFEDK

Pressure Field Extension Diagnostic Kit

Technical / Customer Support:
United States: 800.747.1762 **Canada**: 800.565.3548

fantech®
a systemair company

				
Note	Warning / Important note	Information	Technical information	Practical tip

DO NOT CONNECT POWER SUPPLY until fan is completely installed.
Make sure electrical service to the fan is in the locked "OFF" position.

1. Fantech recommends installation and use of this product by a trained radon professional. Incorrect use will void any and all product warranties or liabilities.
Check your local code restrictions for added safety measures may be needed.
2. This fan has rotating parts and safety precautions should be exercised during operation.
3. **WARNING! TO REDUCE THE RISK OF FIRE. ELECTRIC SHOCK. OR INJURY TO PERSONS – OBSERVE THE FOLLOWING:**
   a. Use this product in the manner intended by the manufacturer. If you have questions, please contact us directly.
   b. CAUTION: Before installation, service or cleaning this product, unplug it first.
   c. Operating this product must be done by qualified person(s) in accordance with all applicable codes and standards.
   d. Duct this fan to outdoors before turning it on.
4. For radon mitigation use only. DO NOT use to exhaust hazardous or explosive vapors.
5. This product shall not be used for pressure testing other than Radon such as Vapor Intrusion, etc, this will violate warranty terms as certain caustic chemicals may have a detrimental effect on the fan or housing life.
6. Do not use this fan with any solid state speed control device.

INSTALLATION

This product is a diagnostic tool to be used for assisting radon mitigators to correctly size an inline fan for sufficiently depressurizing an active soil depressurization system.

We recommend exhausting this diagnostic fan to outdoors using a flexible duct, (not provided). Follow the steps in CALIBRATION SECTION for compensating flexible duct pressure drop.

We also recommend referencing to PVC PIPE PRESSURE DROP CALCULATION SECTION for determining pressure drop for your job.

1. Properly evaluate the property sub-slab and select, cut and evacuate a pit for a 4" PVC pipe.

2. Partially insert a short (12" long) 4" diameter PVC pipe into the pit and seal.

3. Mount the 4" side of one of the two 6x4 LDVI couplers equipped with ringed pressure tube (provided) to the short 4" PVC pipe and tighten hose clamp using a nut-driver (provided).

4. Insert the intake side of fan (provided) into the 6" side of 6x4 LDVI coupler and tighten hose clamp using a nut-driver (provided).

5. Insert the 6" side of the second 6x4 LDVI coupler with ringed pressure tube (provided) to fan exhaust side and tighten hose clamp using a nut-driver (provided).

6. Connect a 4" diameter or larger diameter flexible duct, not provided, to the 4" or larger side of 6x4 LDVI coupler (not provided) and exhaust to outside. Make sure you read CALIBRATE before using fan. Please note, this step is recommended, but is optional.

7. Connect each of two pressure tubes (provided) to digital manometer (provided) and two 6x4 LDVI couplers.

8. Drill several small holes in building foundation slab for pressure field extension evaluation, preferred farthest away from fan intake.

9. Turn fan on by plugging it to a 115 volts household receptacle.

10. Make sure fan is running at maximum RPM; the digital display on top of the electric box cover should read "10.0". If not, gently turn knob on top of fan electric box clockwise. Care should be taken not to damage the knob.

11. Turn the digital manometer on and read pressure drop across the fan. Record this number; it will be needed later.

12. A Water Column pressure of less than 4.4 inches should be measured by the digital manometer. If not, foundation crack sealing or multiple pit must be considered.

13. Check pressure field extension holes for good communication. A micro manometer (not provided) or smoke can be used for this.

14. Lower the fan RPM by turning the fan RPM knob on top of the electric box cover gently counter clockwise.

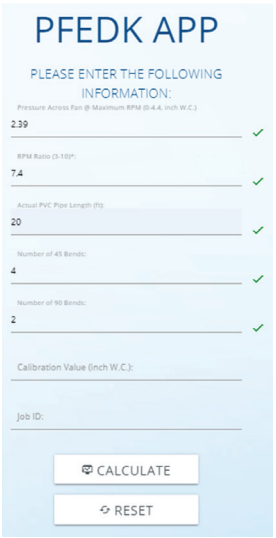
15. Recheck the pressure field extension holes for desired communication.

16. Repeat steps 14 and 15 until a satisfactory pressure drop is registered between the worst pressure filed extension hole and ambient pressure; typically 0.001" WC (3 Pascal).

17. Read and record the digital display on top of fan electric box cover. This should be a number between 3.0 to 10.0.

18. Turn the fan off, but we recommend not dismounting the system yet; just in case you need to repeat the test.

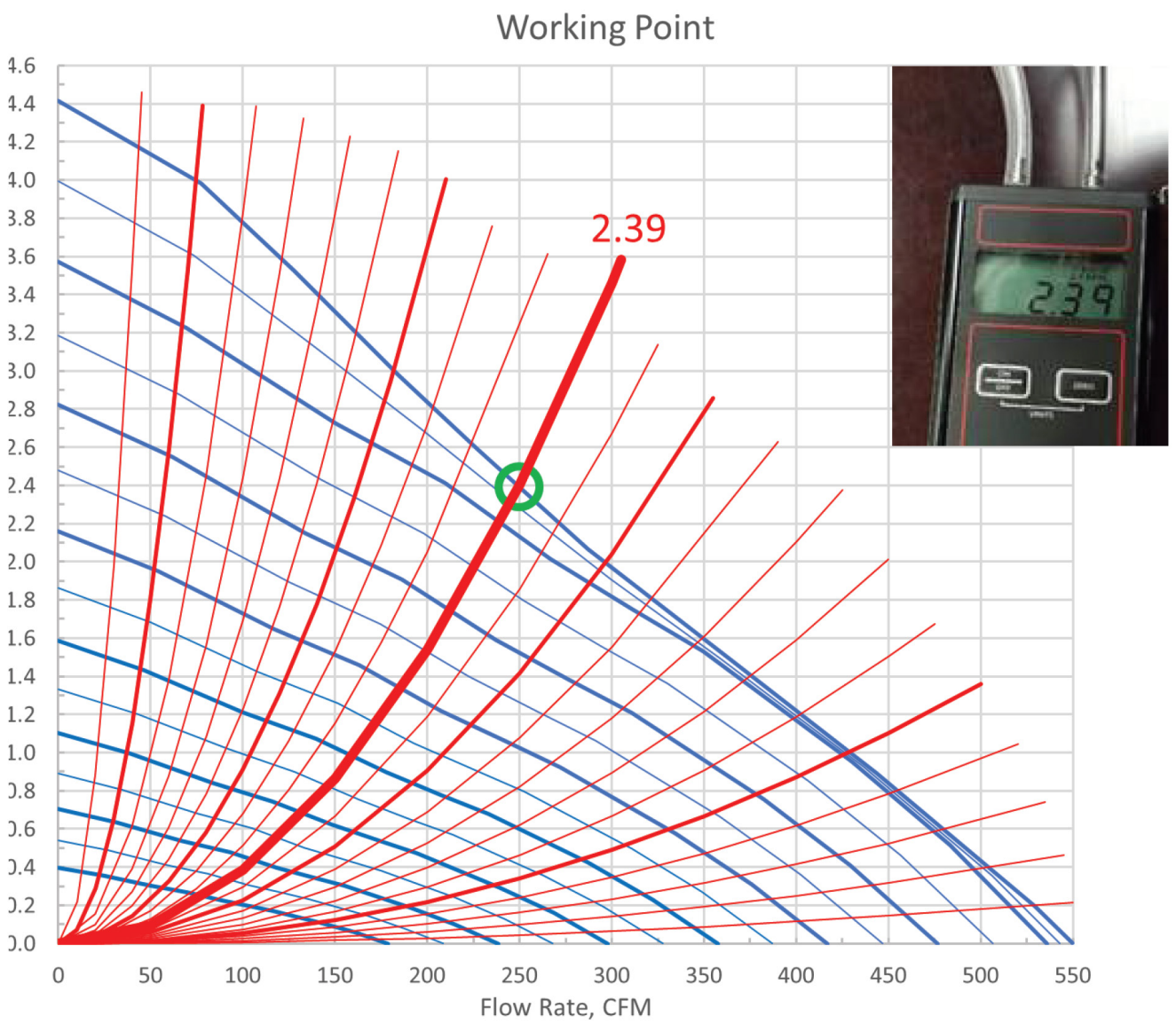
19. If using PFE Diagnostic Kit App



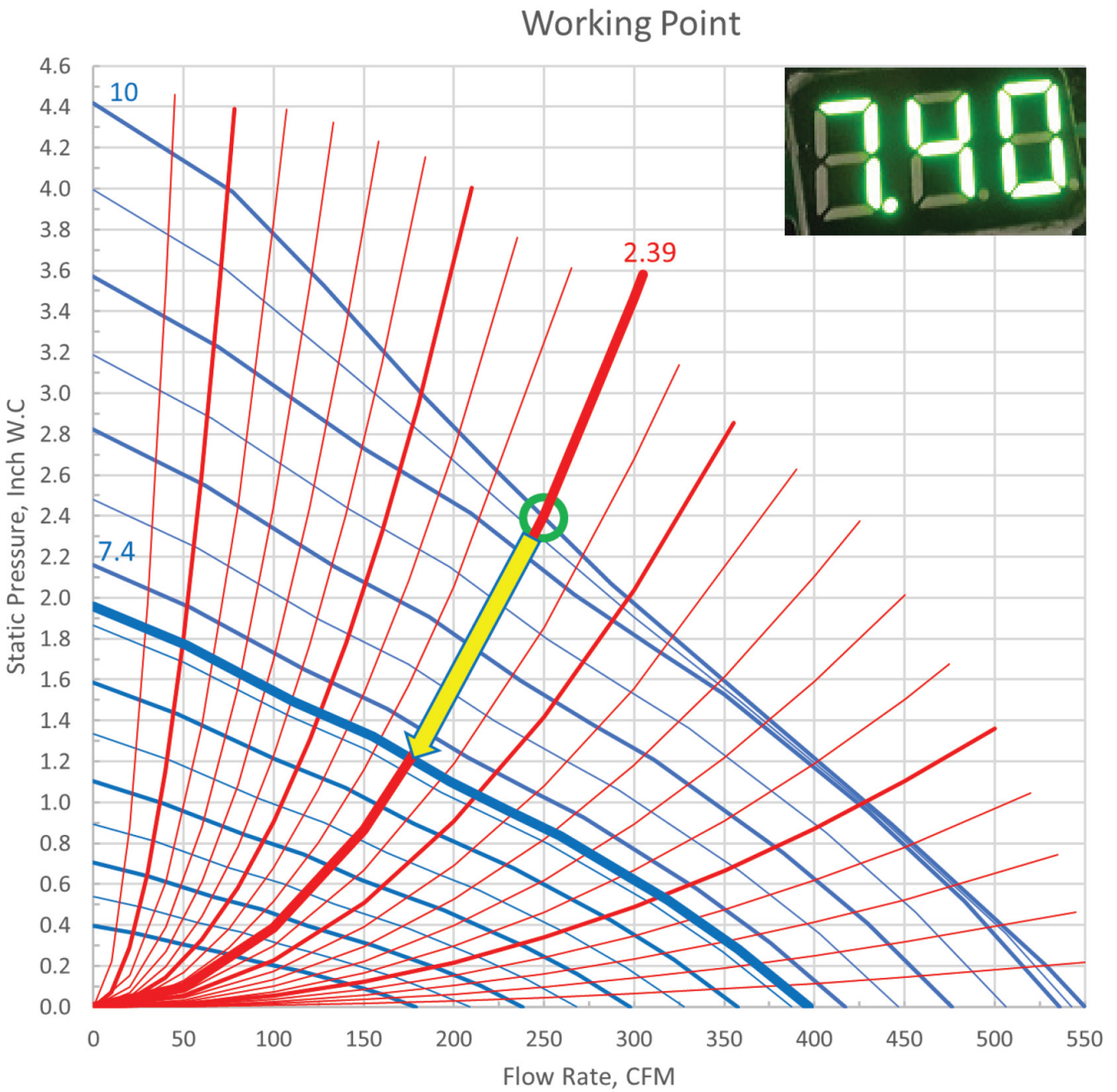
a. Enter pressure drop across fan; 2.39 for this example
b. Enter fan RPM Ratio; 7.4 for this example
c. Enter PVC Pipe Length, 20 for this example
d. Enter Number of 45 Bends, 4
e. Enter Number of 90 Bends, 2

You can access PFE Diagnostic Kit on-line App by typing the following link in your favorite phone or desktop browser;
pfedk.fantech.app

20. If not using the app, plot the following information on the Working Point Graph (provided):
    a. Plot digital manometer reading; green dot and thick red curve



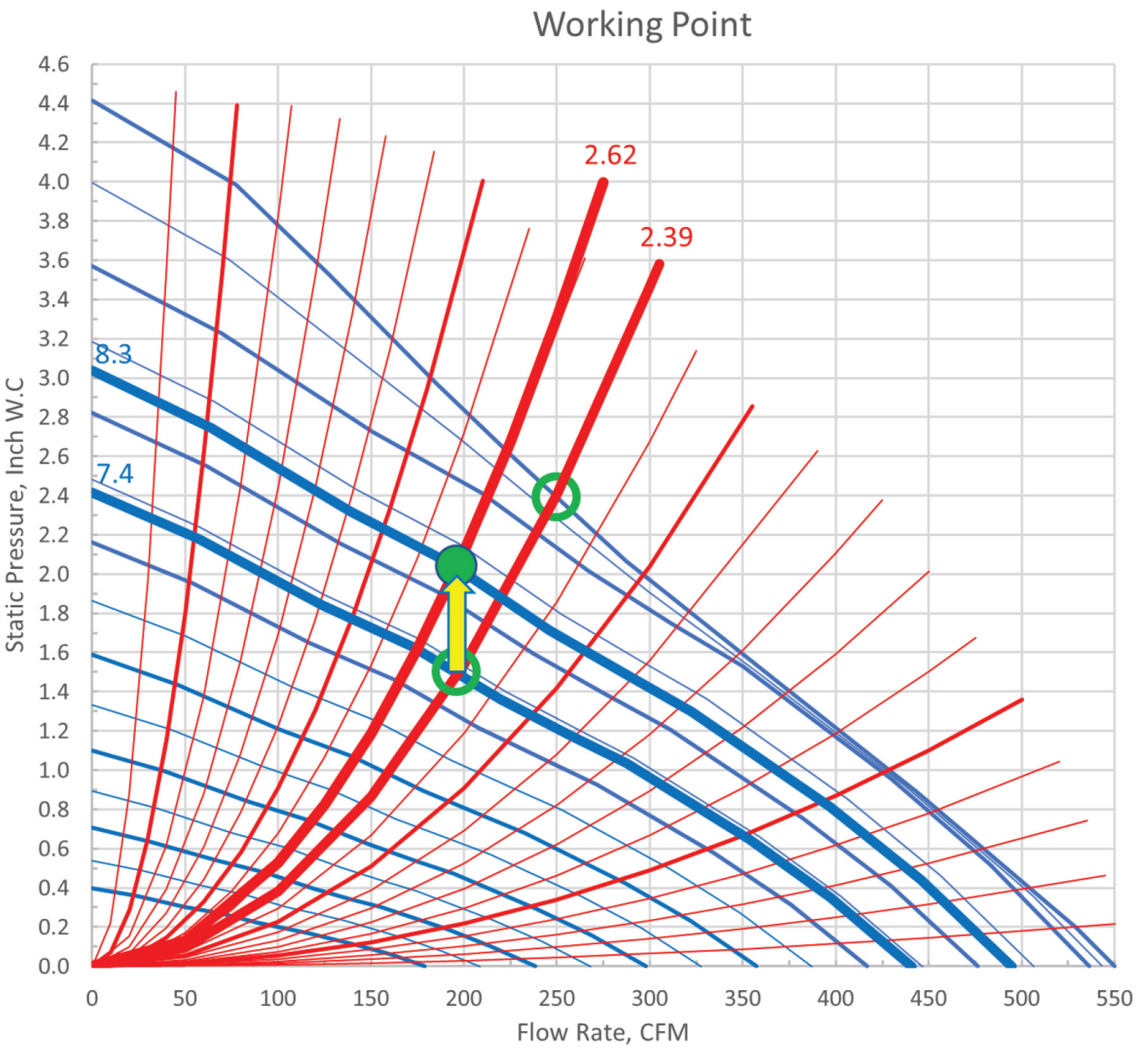
b. Plot fan performance curve for RPM ratio; thick blue curve

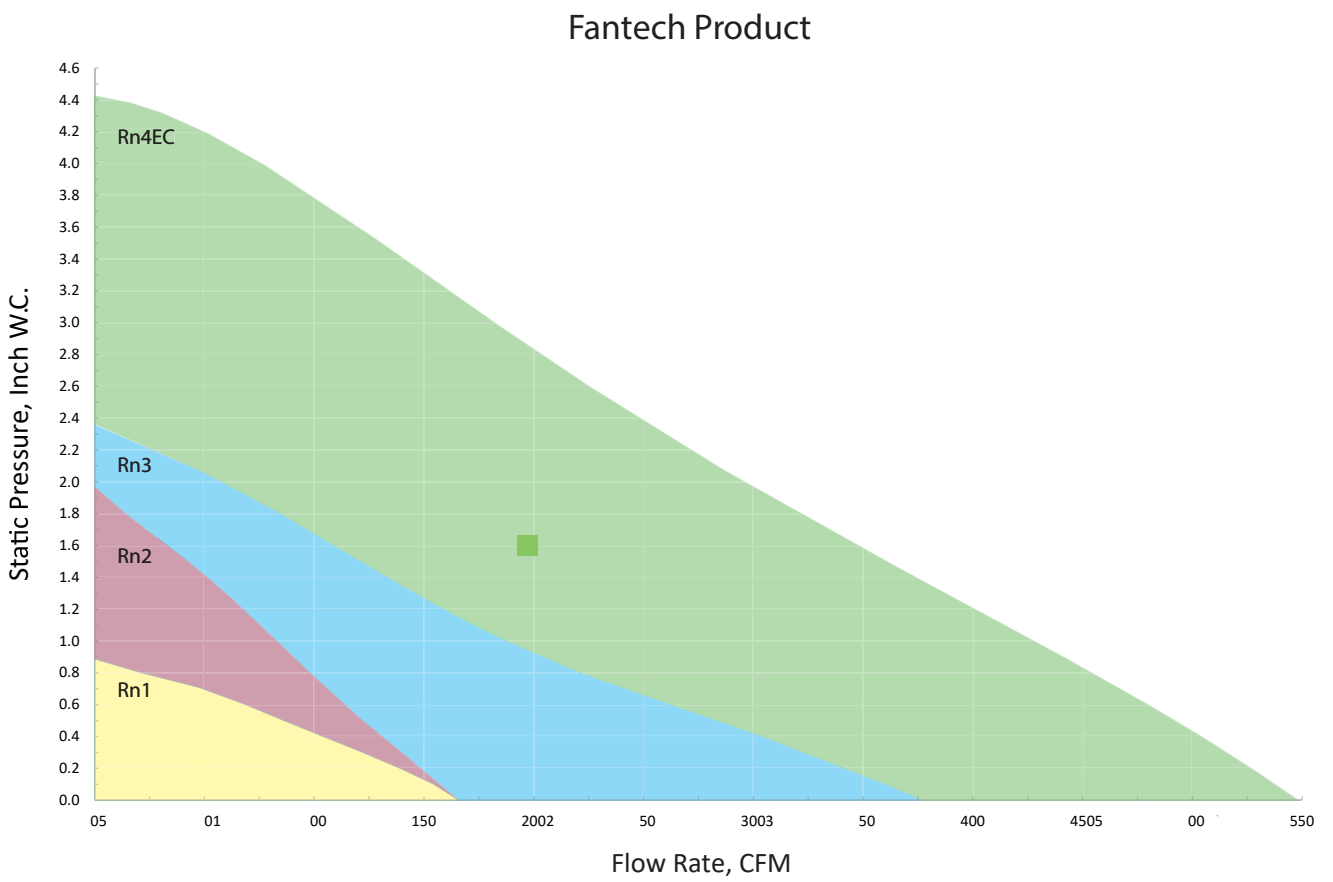


c. Obtain CFM, intersection of these two curves; yellow arrow

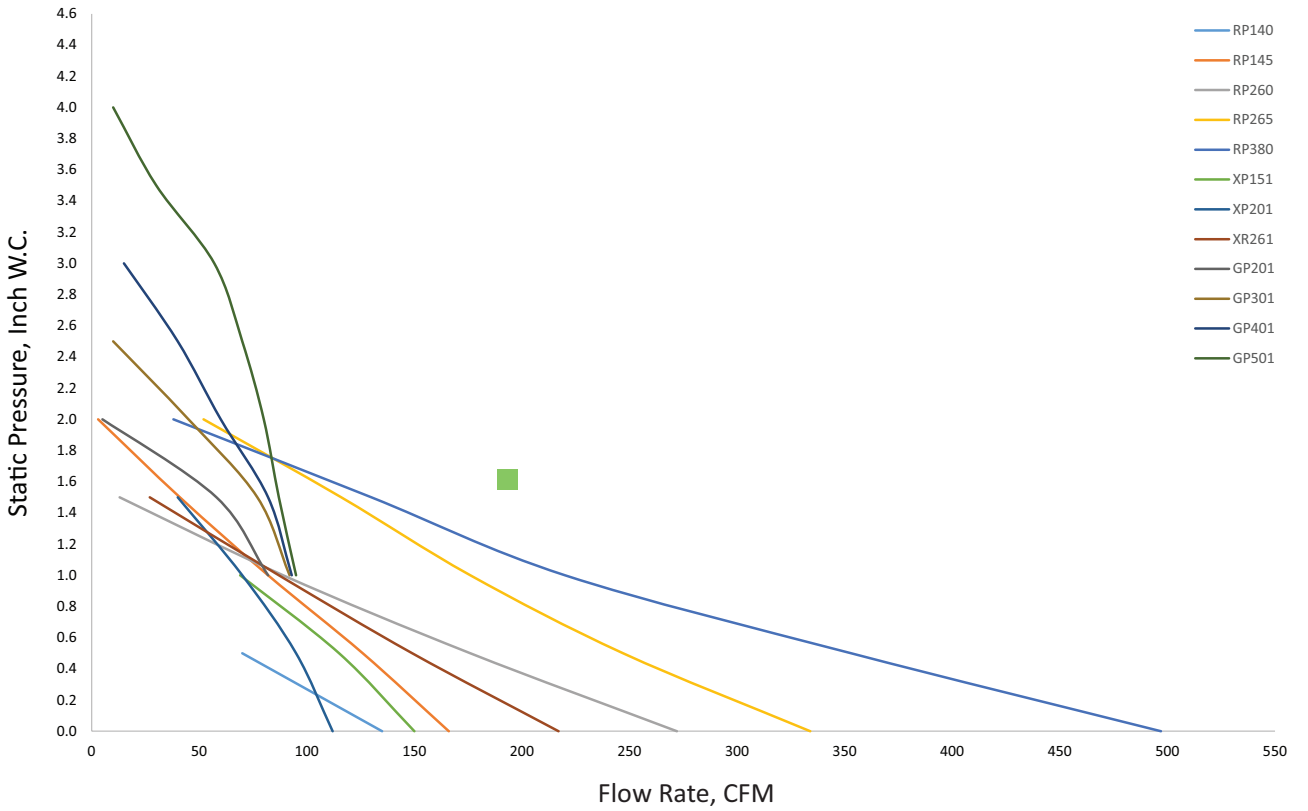
d. Use CFM value to calculate PVC pipe pressure drop as described in PVC PIPE PRESSURE DROP CALCULATION, page 11.

e. Add PVC pipe pressure drop to Working Point value; green solid point.

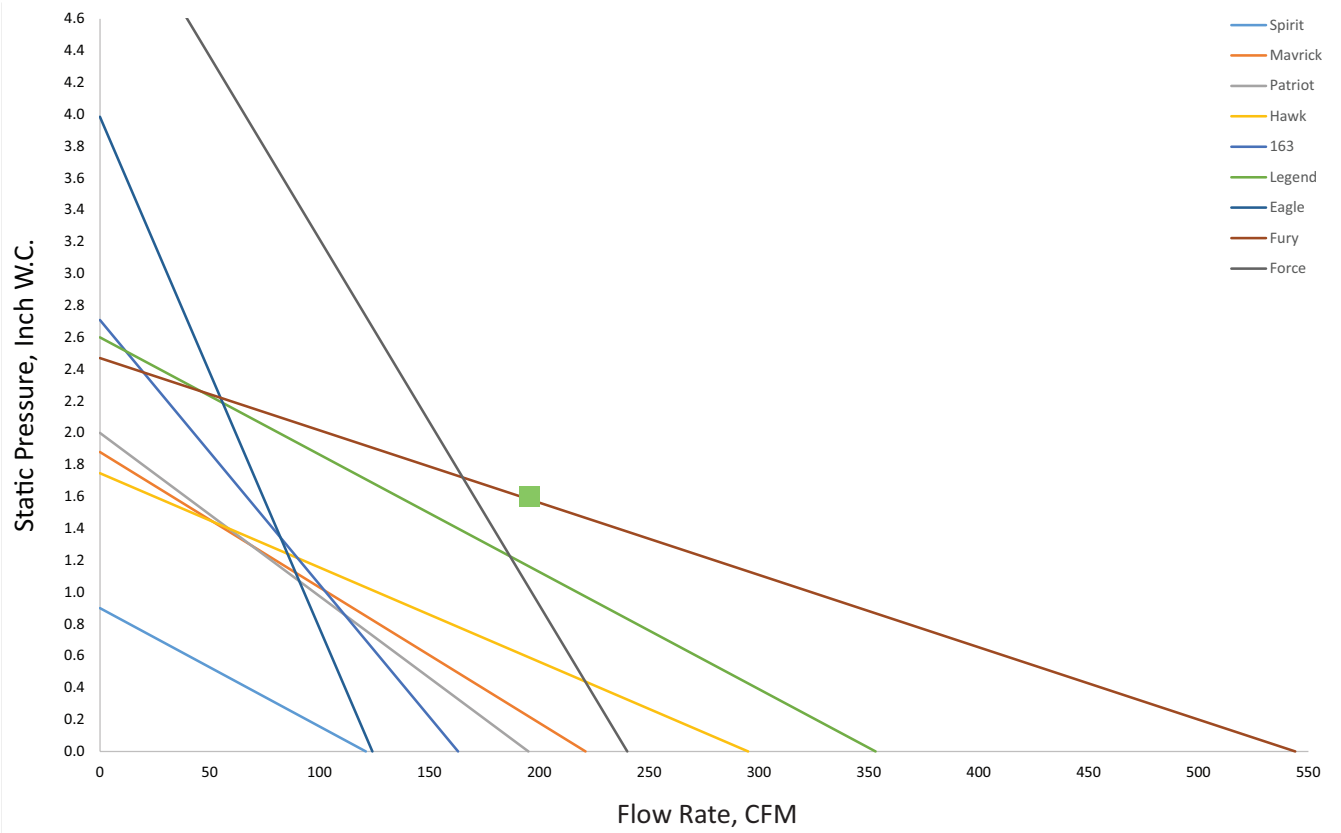



Fantech Product
Static Pressure, Inch W.C.
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Rn4EC
Rn3
Rn2
Rn1
05
01
00
150
2002
50
3003
50
400
4505
00
550
Flow Rate, CFM

RadonAway Products



Festa Products



f. Overlay fan manufacturer performance curves (provided) over Working Point Graph and select a fan that performs equal or better than your system Working Point; Rn4 in this example.
Notes:

- It appears there is not any RadonAway fan that will meet this working point.
- Looks like Festa fan Fury may just make it.
- If an EC fan is selected, fan RPM can be set to RPM ratio; 8.3 in this example.
- Total system curve is different now due to added PVC pipe pressure drop; 2.62.

21. Dismount PFEDK.

22. Congratulations, you just completed the diagnostic part of your design.

23. Install your system.

24. Make sure to recheck pressure field extension holes for sufficient communication.

CALIBRATION

We recommend exhausting fan to outdoors for Pressure Field Diagnostic using a flexible duct, (not provided). However it is important to compensate for this flexible duct pressure loss that would not otherwise be in your design. Follow these steps for compensating for flexible duct pressure drop.

This value varies depending on flexible duct length and diameter, but you will need to do this only once if using the same flexible duct for every test.

Steps:

1. Install one end of the flexible duct to the exhaust side of the fan coupler.

2. Rout the flexible duct to the outdoors.

3. Mount pressure tubes to the digital manometer and both couplers.

4. Turn fan on and run it at maximum RPM. Then lift it several feet for fan intake to be free from any obstructions.

5. Wait until the flexible duct is fully pressurized.

6. Read and record pressure drop displayed on the digital manometer.

7. Stop the fan.

Please note, this value shall be subtracted from your total system pressure drop to compensate for flexible duct pressure drop.

PVC Pipe Pressure Drop Calculation

PVC pipe pressure drop will vary from job to job, but can easily be calculated by taking the following steps in Table 2 (Table 1 shows an example):

1. Select the equivalent linear feet for the 45 and 90 degrees bends from Table 3 and enter them in Table 2 below.
2. Enter quantities of each bend type used; enter zero if not using any.
3. Multiply the equivalent linear feet values & quantities of each bend type.
4. Add values calculated above to total PVC pipe length.
5. Divide this value by 100.
6. Enter pressure drop from Table 4 for desired CFM and PVC pipe diameter.
7. Multiply values from step 5 & 6 to calculate pressure drop for your PVC pipe design.

Table 1. Calculation Example.

		3" Dia. Pipe Example @ 100 CFM		
Steps	Description	Equivalent Linear Feet; (table 1)	Quantity	Calculation
1	45 Bends	2.3	4	2.3 * 4 = 9.2
2	90 Bends	3.2	6	3.2 * 6 = 19.2
3	Total PVC Pipe in feet			20
4	Add Steps 1,2, and 3			9.2 + 19.2 + 20 = 48.4
5	Divide Step 4 by 100			48.4 / 100 = 0.484
6	Enter Pressure Drop / 100 feet (from Table 4)			1.75
7	Multiply Steps 5 and 6			0.484 * 1.75 = 0.847

Table 2. Your Calculation.

		Your Calculation		
Steps	Description	Equivalent Linear Feet; (table 1)	Quantity	Calculation
1	45 Bends			
2	90 Bends			
3	Total PVC Pipe in feet			
4	Add Steps 1,2, and 3			
5	Divide Step 4 by 100			
6	Enter Pressure Drop / 100 feet (from Table 4)			
7	Multiply Steps 5 and 6			

Table 3. PVC Elbow Equivalent Linear Feet.

PVC Elbow Equivalent Linear Feet		
Pipe Diameter	Equivalent Linear Feet	
	45° Bend	90° Bend
2"	1.4'	2.2'
3"	2.3'	3.2'
4"	3.5'	5'
6"	8'	18'

Table 4. PVC Pipe Pressure Drop, per 100'.

PVC Pipe Pressure Drop; Per 100'				
CFM	Pressure Drop, Inch WC			
	PVC Pipe Diameter			
	2"	3"	4"	6"
0	0.0	0.0	0.0	0.000
20	0.71	0.11	-	-
40	2.4	0.35	-	-
50	3.5	0.52	0.13	0.068
60	4.8	0.72	0.18	0.098
70	6.3	0.93	0.24	0.134
80	8	1.2	0.31	0.175
90	10	1.45	0.38	0.222
100	-	1.75	0.46	0.274
110	-	2.05	0.55	0.331
120	-	2.4	0.66	0.394
150	-	3.6	0.97	0.616
200	-	6.95	1.62	1.094
300	-	-	3.3	2.462

WARRANTY

Five (5) Year Warranty

This warranty supersedes all prior warranties

DURING ENTIRE WARRANTY PERIOD:
Fantech will repair or replace any part which has a factory defect in workmanship or material. Product may need to be returned to the Fantech factory, together with a copy of the bill of sale and identified with RMA number.

FOR FACTORY RETURN YOU MUST:

- Have a Return Materials Authorization (RMA) number. This may be obtained by calling Fantech either in the USA at 1.800.747.1762 or in CANADA at 1.800.565.3548. Please have bill of sale available.
- The RMA number must be clearly written on the outside of the carton, or the carton will be refused.
- All parts and/or product will be repaired/replaced and shipped back to buyer; no credit will be issued.

OR

The Distributor may place an order for the warranty part and/or product and is invoiced. The Distributor will receive a credit equal to the invoice only after product is returned prepaid and verified to be defective.

FANTECH WARRANTY TERMS DO NOT PROVIDE FOR REPLACEMENT WITHOUT CHARGE PRIOR TO INSPECTION FOR A DEFECT. REPLACEMENTS ISSUED IN ADVANCE OF DEFECT INSPECTION ARE INVOICED, AND CREDIT IS PENDING INSPECTION OF RETURNED MATERIAL. DEFECTIVE MATERIAL RETURNED BY END USERS SHOULD NOT BE REPLACED BY THE DISTRIBUTOR WITHOUT CHARGE TO THE END USER, AS CREDIT TO DISTRIBUTOR'S ACCOUNT WILL BE PENDING INSPECTION AND VERIFICATION OF ACTUAL DEFECT BY FANTECH.

THE FOLLOWING WARRANTIES DO NOT APPLY:

- Damages from shipping, either concealed or visible. Claim must be filed with freight company.
- Damages resulting from improper wiring or installation.
- Damages or failure caused by acts of God, or resulting from improper consumer procedures, such as:
    1. Improper maintenance
    2. Misuse, abuse, abnormal use, or accident, and
    3. Incorrect electrical voltage or current.
- Removal or any alteration made on the Fantech label control number or date of manufacture.
- Any other warranty, expressed, implied or written, and to any consequential or incidental damages, loss or property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

WARRANTY VALIDATION

- The user must keep a copy of the bill of sale to verify purchase date.
- These warranties give you specific legal rights, and are subject to an applicable consumer protection legislation. You may have additional rights which vary from state to state.

Limitation of Warranty and Liability

This warranty does not apply to any Fantech product or part which has failed as a result of faulty installation or abuse, incorrect electrical connections or alterations made by others, or use under abnormal operating conditions or misapplication of the product or parts. We will not approve for payment any repair not made by us or our authorized agent without prior written consent. The foregoing shall constitute our sole and exclusive warranty and our sole exclusive liability, and is in lieu of any other warranties, whether written, oral, implied or statutory. There are no warranties which extend beyond the description on the page hereof. In no event, whether as a result of breach of contract, or warranty or alleged negligence, defect incorrect advice or other causes, shall Fantech be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of equipment or any other associated equipment, cost of capital, cost of substitute equipment, facilities or services, downtime costs, or claims of customers of purchase for such damages. Fantech neither assumes or authorizes any person to assume for it any other liability in connection with the sale of product(s) or part(s). Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages so the above limitations and exclusions may not apply to you.

Warning

Fantech products are designed and manufactured to provide reliable performance, but they are not guaranteed to be 100% free from defects. Even reliable products will experience occasional failures and this possibility should be recognized by the user. If these products are used in a life support ventilation system where failure could result in loss or injury, the user should provide adequate backup ventilation, supplementary natural ventilation, failure alarm system, or acknowledge willingness to accept the risk of such loss or injury.

NOTES

NOTES

Fantech reserves the right to make technical changes.
For updated documentation please refer to www.fantech.net

Fantech se réserve le droit de faire des changements techniques. Pour de la documentation à jour, s'il vous plaît se référer au www.fantech.net

Fantech®

fantech®
a systemair company