

Fan Installation

Installation

1. General
2. Installation

Recommendation:

- Have data sheets & drawings at hand for reference
- Take a lot of pictures of fan and the system and record ALL readings/ observations IN WRITING (better to have all details ready in office later)
- Use O&M-protocol, chapter 22.1 + 22.2
- Use only correct installation tools and calibrated measurement devices

Installation

1. General
2. Installation

Read O&M Manual BEFORE Installation

- Important chapters:

Chapter	Page	Content
Preface	4	General Notes
2	5	General Installation Notes
7	13	Storage Instructions
14	23	Table with Screw Torque Figures
15	24	Flexible Connection
22.1	29	Installation & Commissioning Protocol
23	30	Fundamental Safety Instructions

Inspect

- Fan casing, impeller and motor for damage and corrosion
- Flexible connections and vibration attenuators for damage/ distortion
- Motor grease and bearing status

Installation - Inspections

If any defect is detected act immediately:

- Repair or replace damaged or defect parts
- Touch-up paint or clean fan and impeller
- Regrease if required

Check for

- Equal impeller-casing gap (visual)
- Correct alignment of
 - foundation/ mounting structure/ console
 - fan
 - flexible connections (axial fans)
 - adjacent ductwork (axial fans)
- Equal loading of vibration attenuators
→ no distortions (visual)

Check for

- Correct installation of
 - safety wires (jet fans)
→ 100% vertical + slack < 10mm
 - tear-off guard (jet fans)
 - anti-swing device (jet fans)
- Correct function of
 - vibration & bearing monitors
 - motor sensors

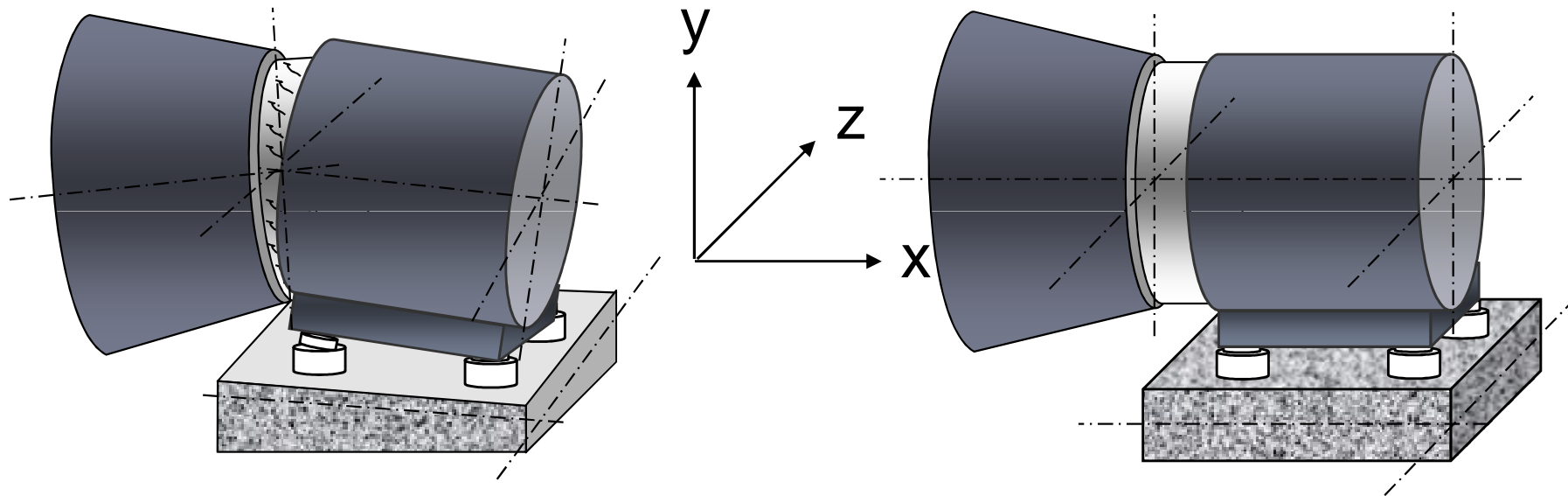
Installation Errors – Fan Alignment

■ Bad:

- Misalignment of foundation & fan
- Flex. connection twisted
- Vibration attenuators distorted

■ Good:

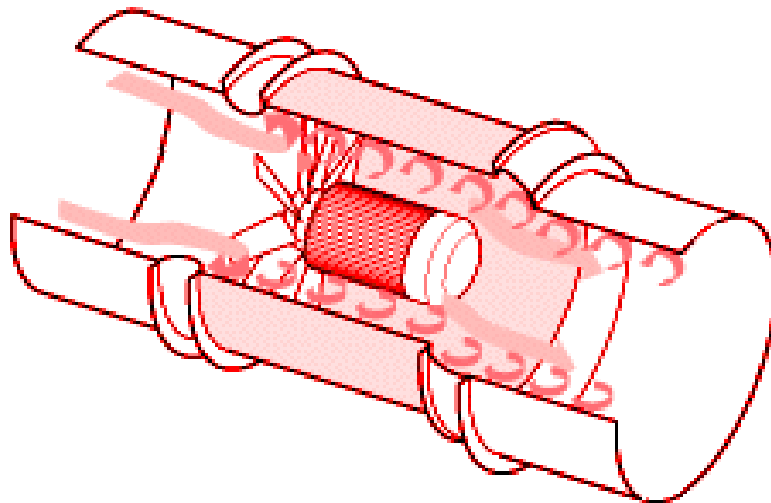
- Foundation & fan 100% aligned in ALL 3 planes
- Flex. connection aligned
- Vibr. attenuators aligned + equally loaded



Installation Errors – Flexible Connection

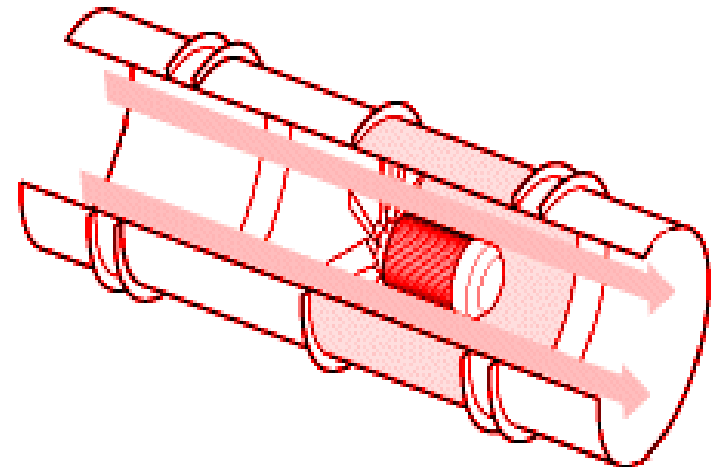
■ Bad:

- Slack (inlet) + misalignment (outlet)
- Turbulences (STALL)



■ Good:

- Correct installation gap + guide duct
- No slack, 100% aligned
- No losses/ no STALL



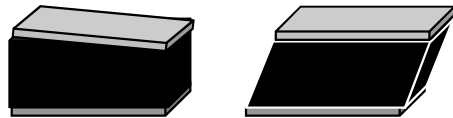
Installation Errors – Vibration Attenuators

■ Bad:

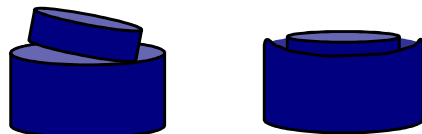
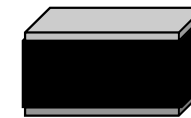
- Distorsion due to misalignment
- Reduced attenuation
- Reduced lifetime

■ Good:

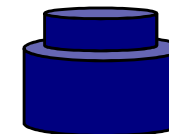
- Correctly Aligned
- 100% Attenuation
- Full Lifetime



Rubber



Steel Spring



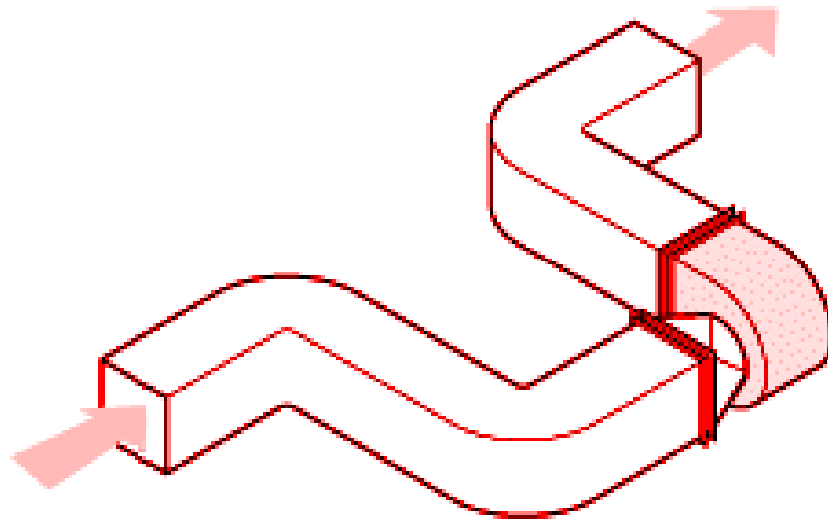
Check for

- Correct torque of screws
(by random check with torque wrench)
- Safety in general
- Installation errors in adjacent system:

Installation Errors – Duct Guiding

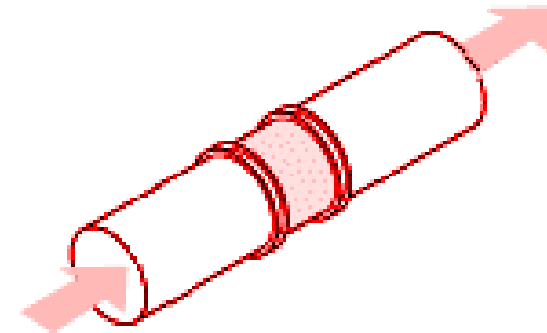
- **Bad:**

- Unnecessary losses



- **Good:**

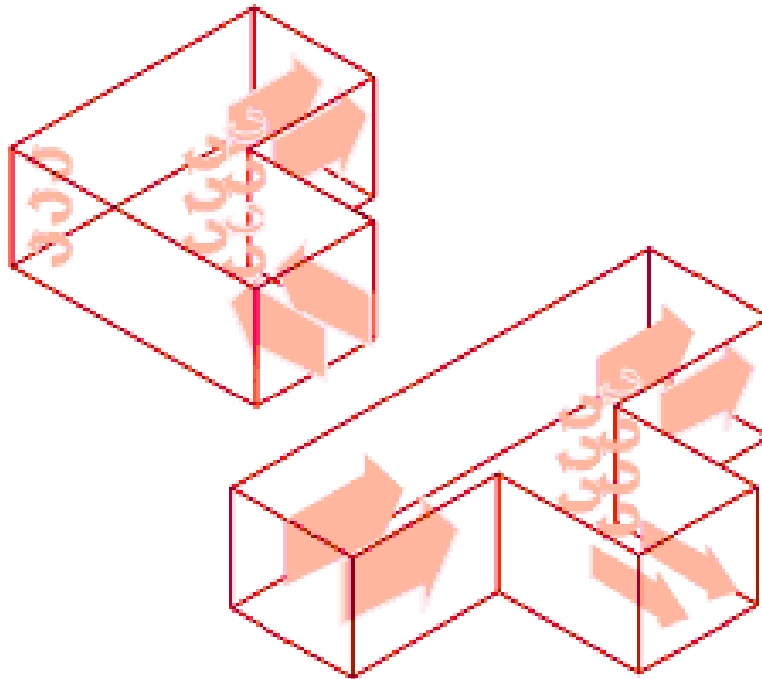
- Air can move straight



Installation Errors – Duct Guiding

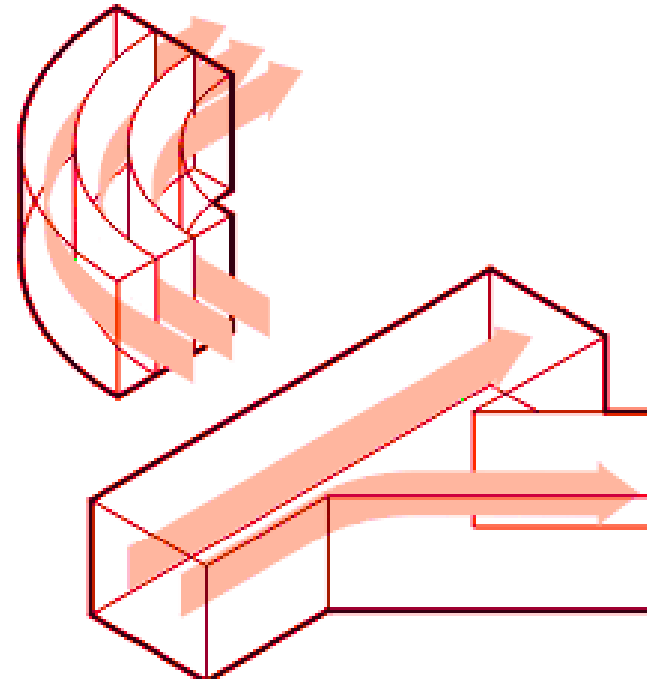
■ Bad:

- Sharp corners
- Turbulences
- Higher losses



■ Good:

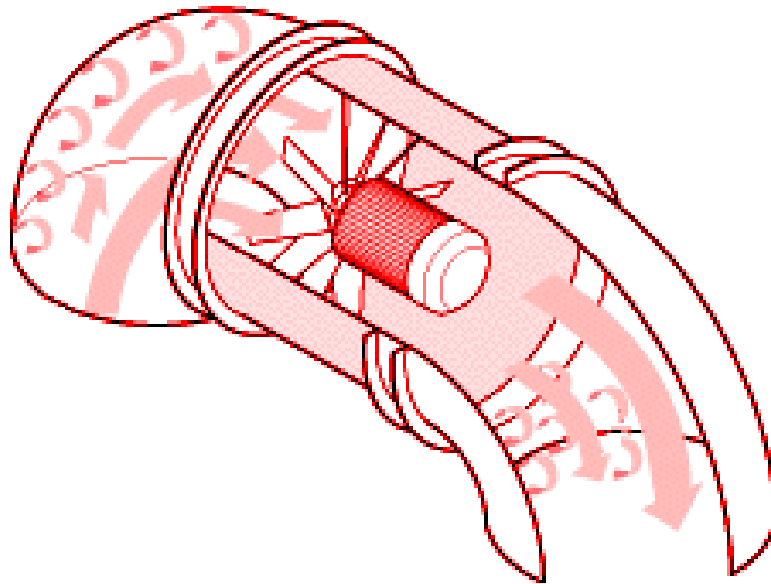
- No sharp edges
- Duct guide vanes
- Reduced losses



Installation Errors – Duct Guiding (Elbow)

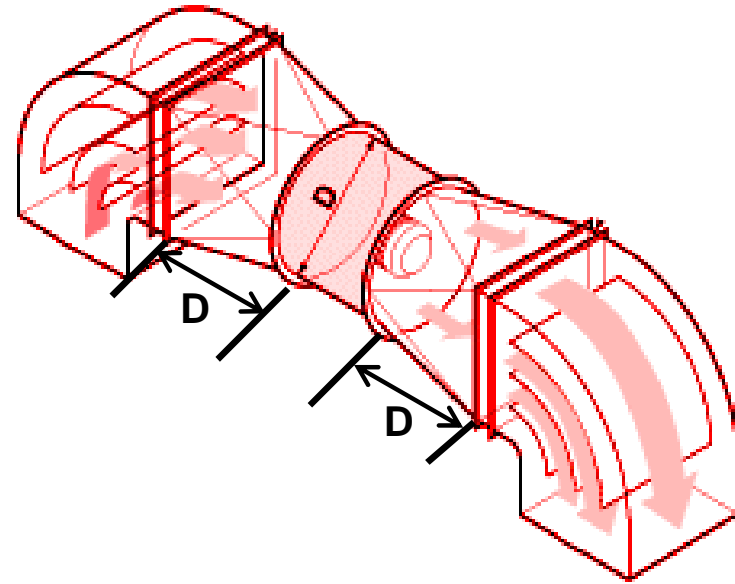
■ Bad:

- Elbow directly in front/ behind fan
- Turbulences (STALL)



■ Good:

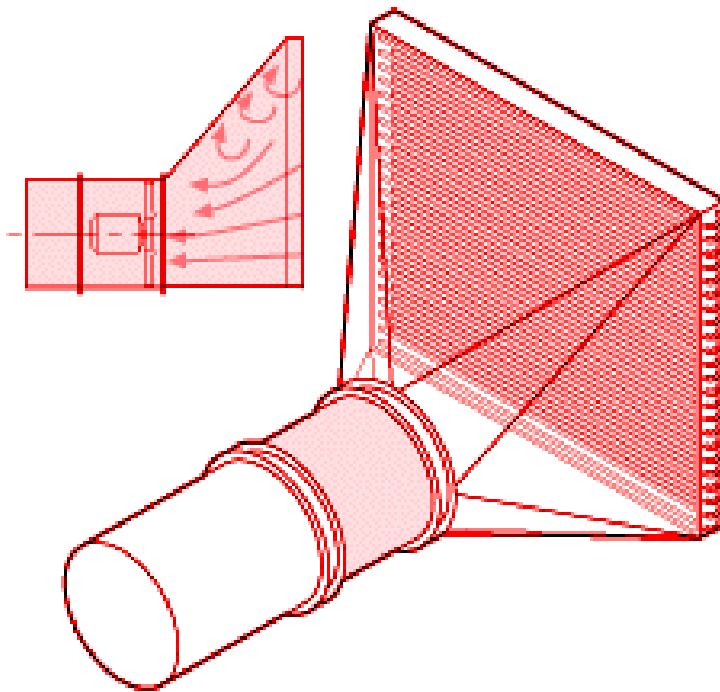
- Duct guide vanes
- Diffusor (1D long)
- Distance in front/ behind the fan



Installation Errors – Inlet Diffusor

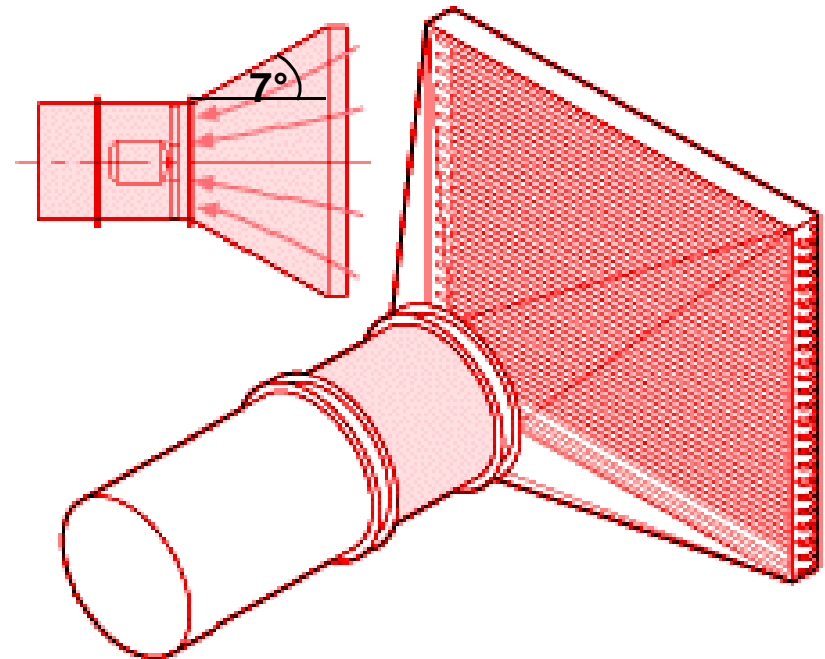
■ Bad:

- Asymmetric shape
- Diffuser angle too steep
- Turbulence (STALL)



■ Good:

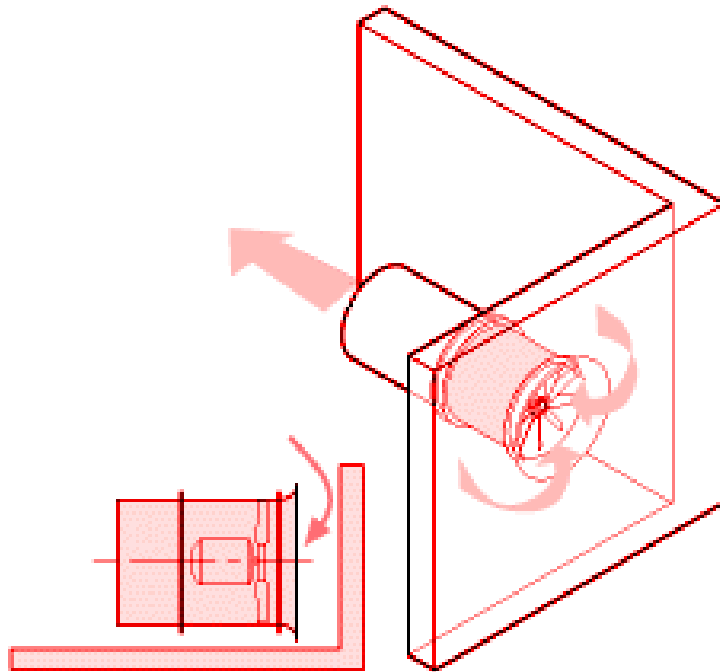
- Symmetric shape
- Shallow angle (max. 7°)



Installation Errors – Free Inlet

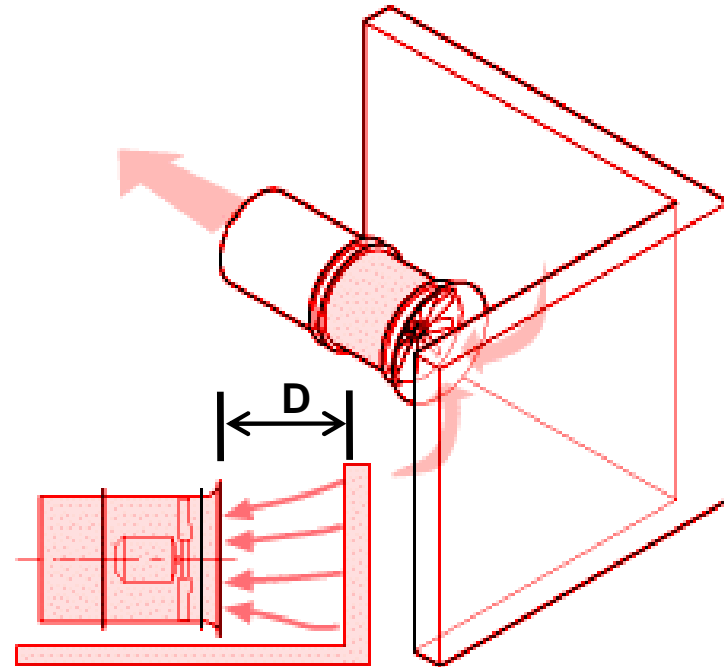
■ Bad:

- Inlet blocked
- Increased press. drop (STALL)



■ Good:

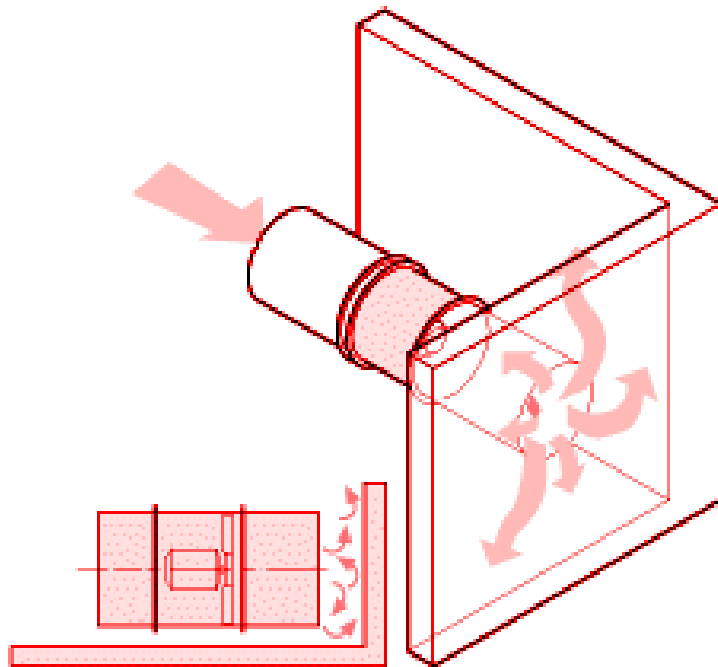
- min. 1D distance
- Always fit an inlet cone on open intakes on open intakes



Installation Errors – Free Outlet

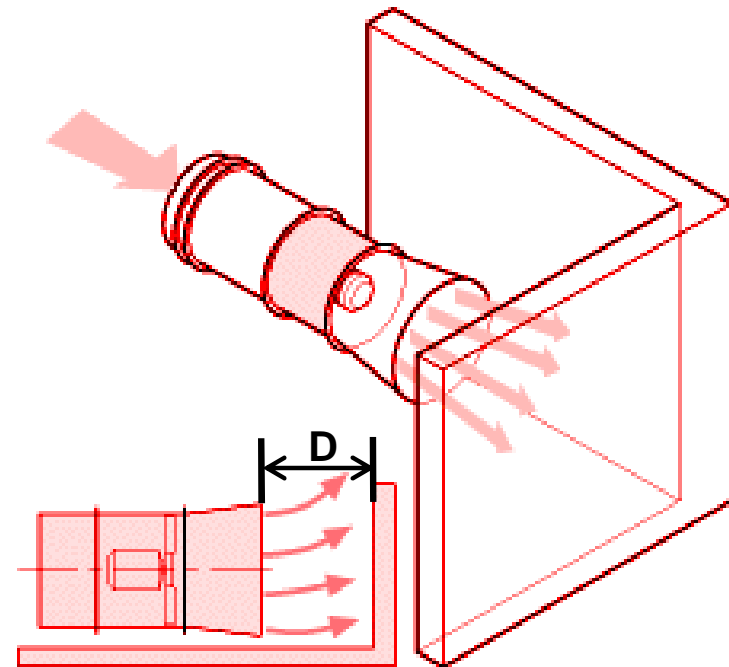
■ Bad:

- Outlet blocked
- Increased press. drop
- Turbulence (STALL)



■ Good:

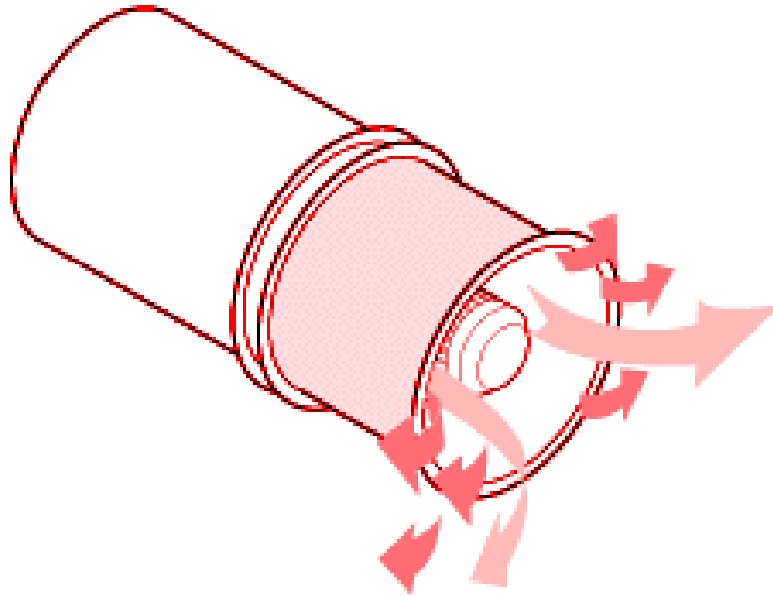
- min. 1D Distance
- Diffuser
- Reduced press. drop



Installation Errors – Free Outlet (Diffusor)

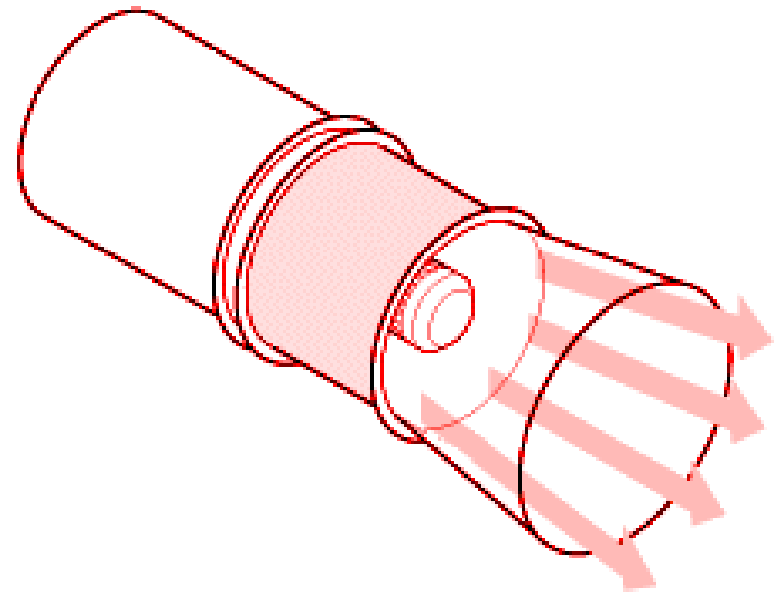
■ Bad:

- No diffuser
- Increased press. drop (higher outlet speed c_{out})
- Turbulence (STALL)



■ Good:

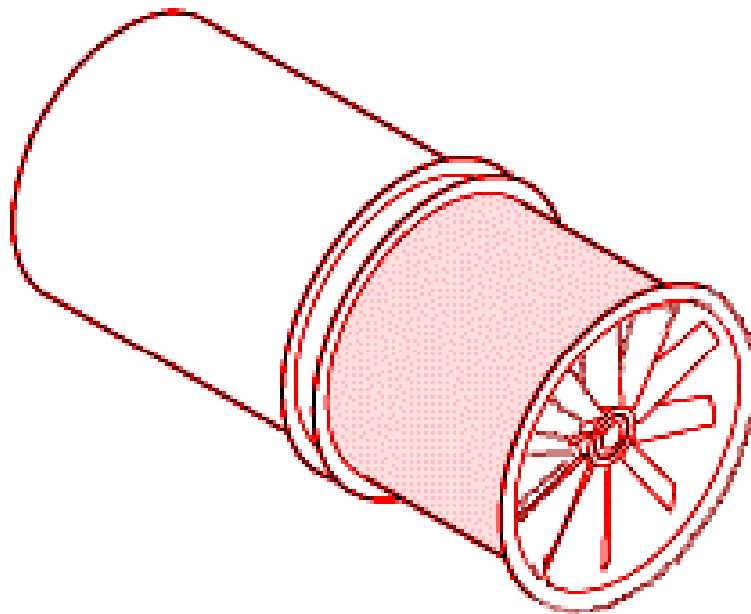
- With diffuser
- Lower outlet speed c_{out}
- Lower press. drop



Installation Errors – Protection Grills

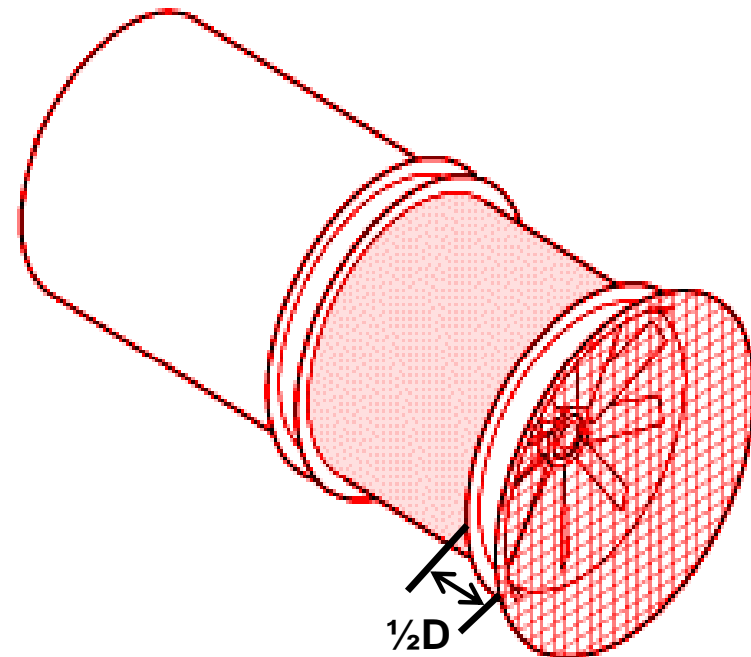
■ Bad:

- No protection grill
- No safety
(fan damage, injuries)



■ Good:

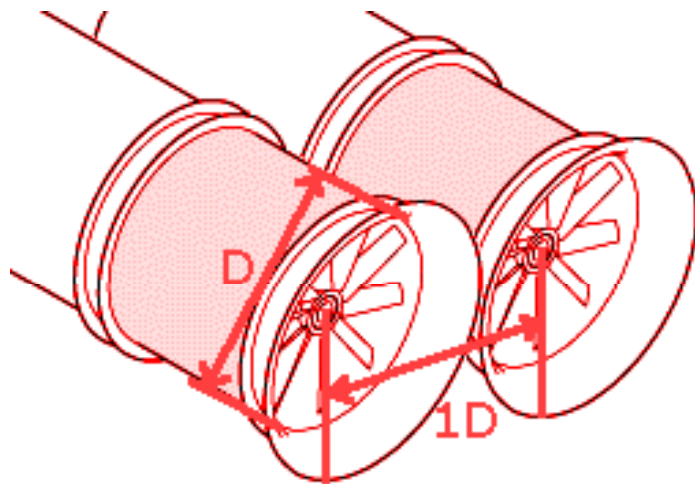
- Protection grill +
bell mouth at inlet
- min. $1/2 D$ distance



Installation Errors – Parallel Operation

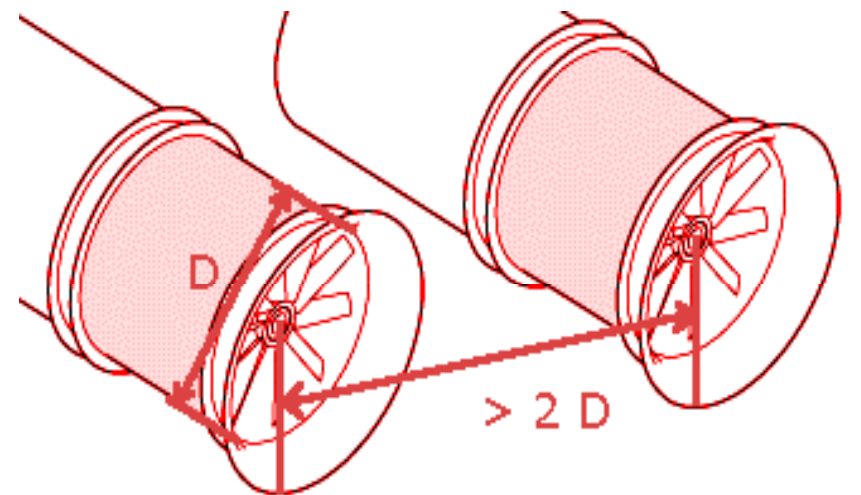
■ Bad:

- No distance
- Disturbance at intake
- Interference of fans (pulsing operation)



■ Good:

- Distance min. $2D$
- No disturbance
- No interference



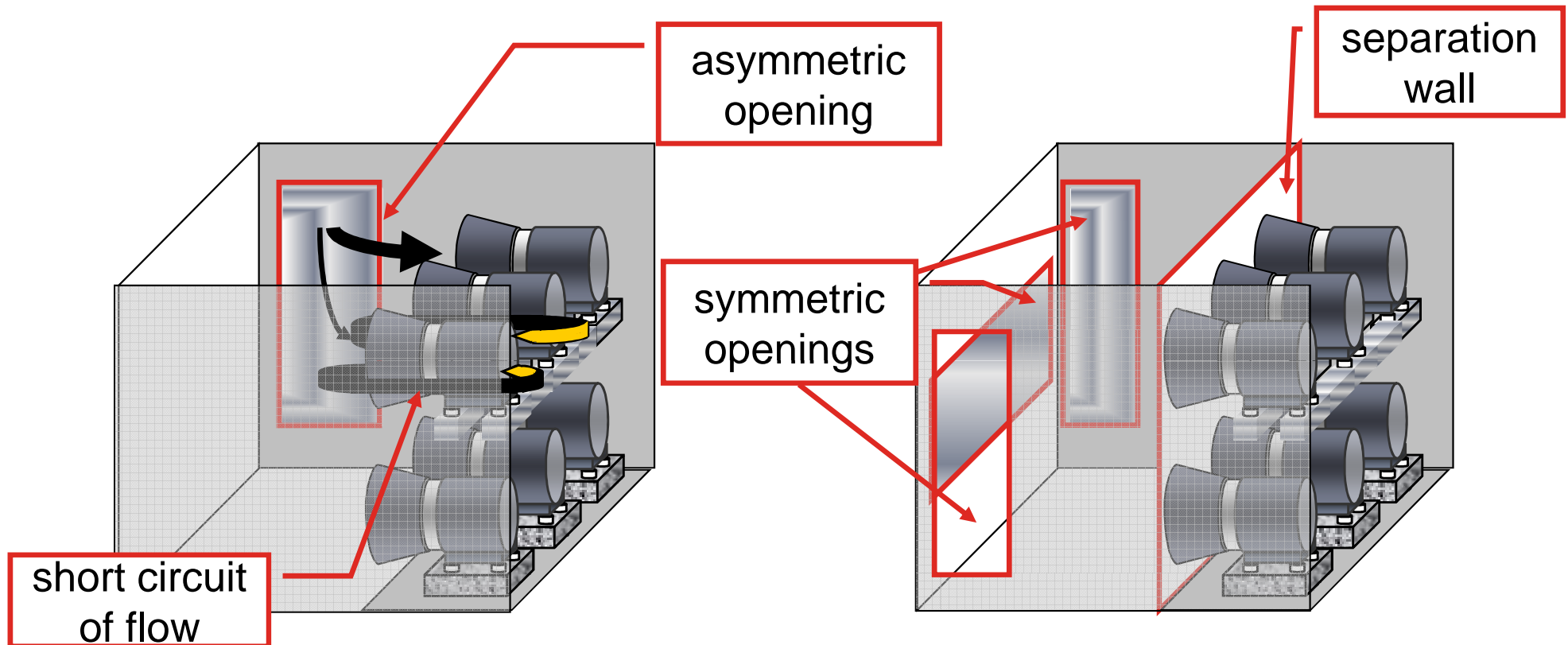
Installation Errors – Parallel Operation

■ Bad:

- Short circuit flow
- Asymmetric Opening
- Unbalance of Fan Performance
- STALL

■ Good:

- Separation wall
- No short circuit flow
- Symmetric Openings



Summary

- Read our O&M manual carefully
- Inspect the fan and its components (impeller, flexible connections, vibration attenuators, safety wires, anti-swing device) and the adjacent system
- Check the installation of fans properly:
 - are they correct aligned?
 - Remove dirt and debris from the building phase

 Incorrect installation might lead to severe fan failures!