

SCOPE

- I 1.1 This practice covers the layout, design, and fabrication of suction, discharge, and interstage piping for reciprocating compressors in process air or gas services.
- I 1.2 This practice also covers requirements for the support of pulsation suppression devices (other than those mounted to the top of cylinders).
- I 1.3 **An asterisk (*)** indicates that additional information is required. If a job is contracted, this additional information is furnished in the Job Specification.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I 2.1 **Where process and air piping systems are to be furnished by the compressor vendor**, the contractor will specify applicable requirements for the design, materials of construction, fabrication, inspection and testing of the piping and auxiliaries.

LAYOUT AND DESIGN

↴ ACOUSTIC SIMULATION STUDIES

- R,O 3.1 Acoustic simulation studies shall be conducted **per IP 10-4-1**.

↴ PIPING SYSTEM

- R 3.2 **Major forces due to gas pulsations** will act along the axis of the pipe. Therefore, the pipe shall be anchored to prevent axial vibration and still allow freedom to accommodate forces due to thermal movement.
- R 3.3 **Access for cleaning.** The piping design shall provide access for chemical or mechanical cleaning and inspection of the intake piping from the outlet flange of the first major vessel to the compressor flanges. The piping design shall also provide access to the recycle and startup bypass piping if these lines enter the "clean" section of the intake system.
- M 3.4 **Access to cylinders.** Piping close to the compressor shall be arranged to allow maintenance access to both sides of all cylinders.
- R 3.5 **Suction and discharge headers and laterals** shall be close to grade to permit installation of restraints. Where the lateral rises to the top of a cylinder, the length of the elevated line shall be arranged or supported to withstand vibration.
- R 3.6 **End connections to compressor headers** are not permitted. Each end of the header shall have blind flanges.
- I * 3.7 **Where blinds are specified**, spectacle or figure eight blinds shall be used.
- R 3.8 **Check valves, knockout pots, or permanent strainers** shall be provided, as required, in the miscellaneous piping lines connected to the process suction line.
- R 3.9 **Temporary strainers** shall be installed in horizontal runs of the process suction lines as closely as possible to the inlet flanges of the pulsation suppression devices.
- R 3.10 **Vibration.** Piping runs shall be supported to avoid resonant frequencies (vibration).
- R 3.11 **Pipe support limitations.** The suction, interstage, and discharge headers, and all piping between headers (other than pressure relief valve piping) shall not be supported by, guided by, or attached to any portion of the building or shelter for the compressors.
- R * 3.12 **Liquid abatement in inlet lines.** Inlet lines handling saturated gas above the minimum ambient temperature, or hydrocarbon gas components heavier than ethane, shall be heat traced and insulated from the knockout drum to the inlet flange. Flanges, valves, and other fittings shall not be insulated. Tracing shall be designed for piping disassembly.

IP 3-3-5		Suction, Discharge, and Interstage Piping for Reciprocating Compressors	EXXON INTERNATIONAL PRACTICE
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- R,O 3.13 **If an acoustic simulation study has not been made**, the following requirements for the piping system are applicable:
- The use of elbows in the piping shall be minimized.
 - Elbows shall not be used between compressor cylinders and pulsation suppression devices.
 - All valves, including pressure relief valves, shall be positioned to minimize the length of piping between the valve and the major process line.
 - Laterals from inlet and discharge headers to compressor cylinders shall be symmetrical.

SUCTION LINES

- R *3.14 **Atmospheric inlet lines** shall be painted internally with the same coating system used for external painting. Alternative proposals to use non-ferrous or non-metallic pipe shall be approved by the Owner's Engineer.
- S 3.15 **The maximum allowable working pressure of inlet block valves and inlet piping from the block valve to the compressor inlet flange** shall not be less than the set pressure of the pressure relief valve protecting the first cylinder.

PIPING SYSTEM CLEANLINESS

- R 4.1 **The compressor inlet and interstage systems**, including piping, pulsation suppression devices, and other vessels or exchangers shall be mechanically or chemically cleaned to remove pipe scale, welding deposits, and other foreign objects prior to operating the compressor.

INSTALLATION OF PULSATION SUPPRESSION DEVICES

- R 5.1 **Adjustable supports** shall be provided for all pulsation suppression devices other than those mounted to the top of cylinders. The supports shall:
- Support the weight of the pulsation suppression device, and any external piping load at normal operating conditions.
 - Permit thermal expansion of the compressor frame along the axis of the cylinder.
 - Permit thermal expansion between the cylinder centerline and the support centerline along the axis of the cylinder nozzle.
 - Prevent movement of the pulsation suppression device along its major axis.
- R 5.2 **The support foundation** shall be integral with the compressor foundation.
- R 5.3 **The support mounting plate** shall be anchored into the foundation, and shall not be dependent upon grouting alone to restrict movement of the plate.
- R 5.4 **Springs shall not be used** for pulsation suppression device piping supports.
- I 5.5 **When the compressor is idle**, the pulsation suppression device may be supported by the cylinder flange.

Revision Memo

9/68	Original Issue of Basic Practice	6/80	Revision 4
1/72	Revision 1	6/82	Revision 5
1/73	Revision 2	12/93	Revision 6
1/75	Revision 3		
3/98	Revision 0 - Original Issue of International Practice		
	Deleted Pars. 3.2 through 3.7, covered by IP 10-4-1. Deleted Pars. 4.2 and 4.3, covered by IP 18-8-1.		

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