

Changes shown by

SCOPE

- I 1.1 This practice covers the design and installation of flushing and drain systems for centrifugal gas compressors and drain systems for rotary gas compressors.
- I 1.2 **An asterisk (*)** indicates that additional information is required. If a job is contracted this additional information is furnished in the Job Specification.

DEFINITIONS

- I 2.1 **A safe location** indicates that no source of ignition exists, such as a closed blowdown system or a slop tank.

FLUSHING SYSTEM

- I 3.1 **Flushing fluid facilities** shall be sized for a maximum flow rate of 3% (by weight) of the gas flow per casing.
- I * 3.2 **If stage flushing (to individual impellers) is specified**, 60% of the total flow rate for the casing shall be sent to the machine suction pipe, and the remaining 40% shall be distributed equally among the stage flushing points.
- I 3.3 **A typical piping layout** is shown in [Figure 1](#).
- R 3.4 **A flushing fluid strainer** of 80 mesh (180 µm) Monel screen shall be provided. All **flushing piping** downstream of the flushing fluid strainer shall be **chemically or mechanically cleaned** to remove scale, slag, and debris.
- O,R 3.5 **Suction nozzle spray**. One atomizing spray nozzle assembly shall be installed in the pipe elbow directly upstream of the compressor suction nozzle. (A typical arrangement is shown in [Figure 2A](#).) Installation shall:
 - a. Allow removal of the nozzle for cleaning without compressor shutdown.
 - b. Ensure that the flushing liquid spray is directed counter to the gas flow.
 - c. Avoid impingement of the spray on the inner wall of the valve and stub.
 Nozzles shall be tackwelded or suitably locked to prevent loosening while in service.
- I,C * 3.6 **Alternative suction spray nozzle assembly designs** which will result in the use of smaller gas shut-off valves and stubs shall be submitted to Owner's Engineer for approval. Such designs may include:
 - a. The use of the gas being compressed to confine the atomization spray angle.
 - b. An adjustable, packed joint design similar to the arrangement shown in [Figure 2B](#).
- O,R 3.7 **Variable area meters** shall be **armored type**, and shall be graduated for the specific flushing fluid to be used. They shall be sized for design flow at maximum scale reading. A correction factor for density shall be furnished.
- O 3.8 **Variable area meters and hand control valves** shall be adjacent to each other and shall be operable from the compressor operating floor.
- S * 3.9 Unless otherwise specified, flushing system components shall be suitable for exposure to the maximum allowable working pressures of the connected compressors.

DRAIN SYSTEMS

- O,R 4.1 **All centrifugal and rotary gas compressors** shall have low point drains for each casing, suction line, discharge line, and any interstage lines.
- O,R 4.2 **Casing drain lines** shall be provided for:
 - a. Each stage drain on centrifugal compressors
 - b. Each drain connection provided on rotary compressors.

IP 3-3-3		Flushing and Drain Piping for Centrifugal and Rotary Gas Compressors	EXXON INTERNATIONAL PRACTICE
Page 2 of 4			
Rev. 0	June 1997		

- O,R 4.3 **Drainage and disposal piping** shall provide:
- Liquid removal during shutdowns and immediately prior to startups
 - A means to test for liquid (bleed)
 - A safe means of liquid disposal (i.e., a closed pipe system to a safe location)
 - Protection against blowback into the casing (check valve).
- O 4.4 **A collecting drum shall be provided** where the casing pressures, with the compressor idle, are not sufficient to force the drained liquid into the disposal system. A typical arrangement is shown in [Figure 1](#).
- I 4.5 **Piping arrangement.** Where casing pressures are sufficient to force the drained liquid into the disposal system, the piping may be arranged per [Figure 3](#).
- S * 4.6 Unless otherwise specified, drain system components shall be suitable for exposure to the maximum allowable working pressures of the connected compressors.

SUCTION LINE DRAIN AND COLLECTING DRUM

- O 4.7 **The suction line drain connection** shall be located between the suction elbow and any gate or control valve in the line. The drain line shall be sloped for gravity flow.
- O 4.8 **The collecting drum shall be located** at a lower level than the compressor suction line. If the suction line is at or near grade, the collecting drum may have to be installed below grade with the nozzles extending above grade. The gage glass shall be eliminated and an internal float level indication and high level alarm shall be provided.
- I 4.9 **The collecting drum** shall be 8 in. (200 mm) minimum diameter to provide for level indication. The exact diameter and length for each installation shall be determined after review of the system size and expected volume of liquid blowdown.
- R 4.10 Each **casing drain line size** shall not be less than that of the drain opening in the casing. Drain valves shall be located close to the casing and accessible.
- I 4.11 **Casing drain lines** may be **routed** over the compressor baseplate if a continuous slope can be provided.
- I 4.12 **The discharge line drain** shall also be used to pressure liquid out of the collecting drum if a collecting drum is required.

Revision Memo

9/68 1/75 6/75 6/83 6/97	Original Issue of Basic Practice Revision 1 Revision 2 Revision 3 Revision 0 - Original Issue of International Practice Par. 4.8 revised for below grade level indication and alarm. Figure 1 revised. Figures renumbered and spray nozzle Figure 4 eliminated.
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