These instructions describe the installation, operation and maintenance of the subject equipment. Failure to strictly follow these instructions can lead to an equipment rupture that may cause significant property damage, severe personal injury and even death. If you do not understand these instructions, please call De Nora Water Technologies for clarification before commencing any work at 215-997-4000 and ask for a Field Service Manager. De Nora Water Technologies reserves the rights to make engineering refinements that may not be described herein. It is the responsibility of the installer to contact De Nora Water Technologies for information that cannot be answered specifically by these instructions.

Any customer request to alter or reduce the design safeguards incorporated into De Nora Water Technologies equipment is conditioned on the customer absolving De Nora Water Technologies from any consequences of such a decision.

De Nora Water Technologies has developed the recommended installation, operating and maintenance procedures with careful attention to safety. In addition to instruction/operating manuals, all instructions given on labels or attached tags should be followed. Regardless of these efforts, it is not possible to eliminate all hazards from the equipment or foresee every possible hazard that may occur. It is the responsibility of the installer to ensure that the recommended installation instructions are followed. It is the responsibility of the user to ensure that the recommended operating and maintenance instructions are followed. De Nora Water Technologies cannot be responsible deviations from the recommended instructions that may result in a hazardous or unsafe condition.

De Nora Water Technologies cannot be responsible for the overall system design of which our equipment may be an integral part of or any unauthorized modifications to the equipment made by any party other that De Nora Water Technologies.

De Nora Water Technologies takes all reasonable precautions in packaging the equipment to prevent shipping damage. Carefully inspect each item and report damages immediately to the shipping agent involved for equipment shipped “F.O.B. Colmar” or to De Nora Water Technologies for equipment shipped “F.O.B Jobsite”. Do not install damaged equipment.

De Nora Water Technologies, Colmar Operations
Colmar, Pennsylvania, USA
is ISO 9001: 2008 Certified
# Table of Contents

1 INTRODUCTION ............................................................................................................. 4  
1.1 Reference Literature .................................................................................................. 4

2 INSTALLATION ............................................................................................................ 5  
2.1 Pressure Relief Valve and Rupture Disc .................................................................. 5  
2.2 Location ..................................................................................................................... 5  
2.3 Piping Materials ....................................................................................................... 5  
2.4 Vent Piping ............................................................................................................... 5  
2.5 Relief Valve Calibration ............................................................................................. 5

3 OPERATION .................................................................................................................... 8

4 SERVICE .......................................................................................................................... 9  
4.1 Inspection and Cleaning of Pressure Relief Valve ..................................................... 9  
4.2 Rupture Disc Replacement ....................................................................................... 9

FIGURES  
1 Chlorine/Sulfur Dioxide Pressure Relief Valve Dimensions ....................................... 4  
2 Rupture Disc Replacement .......................................................................................... 6  
3 Pressure Relief Valve Assembly With Pressure Gauge ............................................... 6  
4 Pressure Relief Valve With Switch .............................................................................. 7
1 INTRODUCTION

1.1 Reference Literature

The following literature is referenced throughout this instruction manual:

115.6030 - Vaporizer instruction manual
115.3002 - Vaporizer piping connections

The pressure relief valve is designed to prevent excessive gas pressure within the liquid vaporizer (or other protected equipment) by venting pressures in excess of 300 psig (2068 kPa) to a location where emergency discharge of gas can be safely tolerated. It is mounted downstream of a rupture disc assembly which is designed to rupture at 300 psig (2068 kPa). An optional pressure switch or gauge may be installed between the relief valve and rupture disc to indicate a ruptured disc condition.

The pressure relief valve is designed to be utilized on systems, with capacities for chlorine up to 10,000 PPD (200 kg/h), and for sulfur dioxide up to 8,000 PPD (150 kg/h) See Figure 1.
2 INSTALLATION

Refer to the liquid vaporizer instruction manual 115.6030 for details on installation of the pressure relief valve when used with the vaporizer.

When used to protect other equipment, the following guidelines apply:

2.1 Pressure Relief Valve and Rupture Disc

Install the pressure relief valve as shown in bulletin 115.3002, and Figures 3 and 4.

2.1.1 The relief valve must be installed without a shutoff valve between it and the vaporizer’s gas outlet. Install a manual valve in parallel with the pressure relief valve. This valve will normally be in the closed position. It may be opened as a manual vent valve only. Route a 1" vent pipe (schedule 80 seamless steel pipe [ASTM A-106, Grade B]) from the pressure relief valve to a point outdoors where gas discharge can be tolerated. Position the end of the pipe downward so it will not collect foreign matter or water.

2.1.2 Always install rupture disc between pressure relief valve and the protected equipment. Install as indicated in Figure 3. The rupture disc burst pressure rating must not be greater than the pressure relief valve setting.

2.1.3 An optional pressure switch set to actuate at 200 psig (1380 kPa/13.8 bar) may be installed in the gas line between the vaporizer discharge and the pressure relief assembly. This will act as an early warning of an over-pressure condition.

2.2 Location

2.2.1 The pressure relief valve must be installed with no shutoff valves between it and the protected equipment.

2.2.2 The relief valve is designed to relieve at 300 psig (2068 kPa). It is mounted downstream of a rupture disc assembly which is designed to rupture at 300 psig (2068 kPa). An optional pressure switch or gauge may be installed between the relief valve and rupture disc to indicate a ruptured disc condition. See Figures 3 and 4.

2.3 Piping Materials

All piping to and from the pressure relief valve should be schedule 80 seamless steel pipe (ASTM A-106, Grade B) with 3000 lb. CWP forged steel fittings (A-105, Grade I or Grade II). Joints should be coated with a white lead paste, PTFE tape or other methods recommended by the Chlorine Institute. Teflon pastes certified for gaseous and liquefied gas service for the chosen gas may also be used.

2.4 Vent Piping

Install the pressure relief valve with the side connection pointing towards the vent. Route an unrestricted one inch (1") vent pipe (schedule 80 seamless steel pipe [ASTM A-106, Grade B]) from the valve to a location where emergency discharge of chlorine gas can be safely tolerated. The end of the pipe must be positioned or protected to prevent rainwater or foreign materials from entering the pipe.

2.5 Relief Valve Calibration

The relief valve is calibrated at the factory to open at 300 psig (2068 kPa). No additional adjustment is required.
Figure 2 - Rupture Disc Replacement

RUPTURE DISC ASSEMBLY. NON-FRAGMENTING TYPE, RATED AT 250 PSIG (1700 KPA) FOR THE VAX4690.

Figure 3 - Pressure Relief Valve Assembly With Pressure Gauge

PRESSURE RELIEF VALVE SET AT 300 PSIG (2100 KPA) (REPLACEMENT PART NO. BM-4060)

RUPTURE DISC ASSEMBLY. NON-FRAGMENTING TYPE, RATED AT 250 PSIG (1700 KPA) FOR THE VAX4690 AT 300 PSIG (2100 KPA) FOR THE 71V3000 (REPLACEMENT PARTS: R-1827 FOR THE VAX4690, 18704-1 FOR 71V3000)

600 PSIG (42 kg/cm²) PRESSURE GAUGE WITH DIAPHRAGM PROTECTOR (REPLACEMENT PART NO. A-356)

FLOW DIRECTION
Figure 4- Pressure Relief Valve With Switch

1. PRESSURE RELIEF VALVE
   SET AT 300 PSIG (21 BAR)
   (REPLACEMENT PART NO. BM-4060)

2. PRESSURE SWITCH
   WITH PROTECTIVE DIAPHRAGM
   SET AT 40 PSIG (3 BAR)
   (REPLACEMENT PART NO. R-733)

3. RUPTURE DISC
   NON-FRAGMENTING TYPE
   (REPLACEMENT PARTS:
   1B704-1 FOR 71V3000)
   300 PSIG (2068KPA)

4. 1 INCH NPT VENT CONNECTION

5. 1 INCH NPT CONNECTION

6. SAFETY HEAD (R-728)

7. WIRE CODE:
   BLUE = N.O.
   BROWN = C
   RED = N.C.

8. 1/2 INCH THREAD
   FOR ELECTRICAL
   CONDUIT CONNECTION

9. 12 [305]

10. 5 [130]

11. 5 [130]

12. 14 1/2 [370]

LEGEND: INCHES [MILLIMETERS]
3 OPERATION

Be sure the manual bypass valve is closed before introducing chemical.

The relief valve will require re-calibration upon disassembly for cleaning following an over-pressure condition.
4 SERVICE

Routine inspection and testing of the pressure relief valve when the protected equipment is shut down for maintenance, will ensure safe operation.

4.1 Inspection and Cleaning of Pressure Relief Valve

Routine maintenance procedure for use when valve has not vented since last inspection.

4.1.1 Shut down the system. If used with the liquid vaporizer, refer to the shut-down section of the Vaporizer Instruction Manual 115.6030. Be certain that there is no gas under pressure in the system before proceeding.

4.1.2 Remove the spring bolt by turning counterclockwise until it is free to pull out of the body. Count and note the number of turns when removing the spring bolt. This number should be used in 4.1.5.

4.1.3 Inspect the valve plug assembly for scratches and nicks. If they are present, replace the assembly. If a good seating surface is indicated, clean plug with soap and hot water or a mild solvent. Dry thoroughly.

4.1.4 Inspect the valve seat area of the body, clean and dry. If the seat is not smooth, replace.

4.1.5 Install the valve plug assembly and screw into body to previous depth using the same number of turns noted from 4.1.2.

4.1.6 A check of the pressure relief valve may be made by removing the entire valve from the system and testing on a hydrostatic pressure pump. Adjusting pressure higher or lower may be accomplished by turning spring bolt in or out.

4.1.7 The pressure relief valve may also be checked in the piping system by filling the system with nitrogen or dry air to the desired blow off pressure, adjusting valve as previously described. To prevent premature rupture of the rupture discs, when performing this test, be sure to remove any that may be exposed to the test pressure. Reinstall the rupture discs after the test is completed.

4.2 Rupture Disc Replacement

If one of the rupture discs are ruptured, as indicated by the pressure switch or the pressure gauge actuation, refer to Figures 2, 3, or 4, and proceed as follows:

4.2.1 Refer to the Vaporizer instruction manual, and shut down the vaporizer.

4.2.2 When the vaporizer is shut down completely and pressure is removed from the system, loosen and remove the four studs securing the inlet and outlet flanges.

4.2.3 Remove the ruptured disc.

4.2.4 Install a new rupture disc with the dome facing upward. System pressure must be against the concave side of the disc.

4.2.5 Install lightly oiled, free running studs and nuts to finger tightness. Using a cross torquing pattern, torque each nut with a calibrated torque wrench at 20% increments of the torque value recommended by the manufacturer. Repeat 20% increments and cross torquing pattern until final torque value is achieved.

4.2.6 Ensure the flanges are parallel.

4.2.7 Re-start the vaporizer according to the procedure in the vaporizer instruction manual 115.6030.