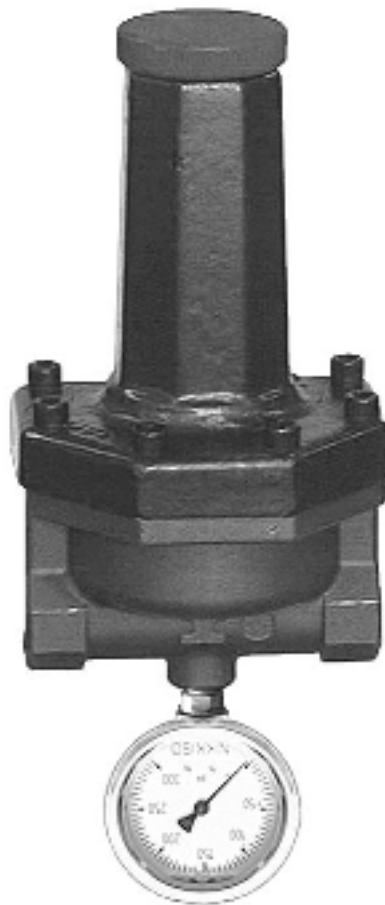


**NIKKISO Pumps America, Inc.**

# **NIKKISO HYDROGARD™**

**Safety Relief Valves**



**INSTALLATION, OPERATION AND  
MAINTENANCE MANUAL**

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## Warranty

NIKKISO Pumps America, Inc. warrants its products against defects in workmanship or material under specified use and service for a period of 24 months from placement into service or 30 months from date of shipment. The obligation and liability of NIKKISO Pumps America, Inc. is limited to repairing or replacing (at its option) such allegedly defective goods as are returned to NIKKISO Pumps America's plant. No liability is assumed for removal or reinstallation costs, warrants of merchantability or fitness for a particular purpose except as specified. Liability for consequential damages (including personal injury) is hereby excluded; liability in any event being limited to the original purchase price of the good involved.

Defects shall not include decomposition by abrasion, chemical action, water, or caused by the presence of materials or conditions not specified. The component materials set forth in a proposal and/or the specifications of an order are recommended by NIKKISO Pumps America, Inc. for the particular application. But such recommendations shall not be construed as warranty or guarantee against wear and/or corrosion, such recommendations are subject in all cases to verification and acceptance by purchaser. Any warranty on equipment and accessories furnished by outside manufacturers shall be limited to the warranty of the respective equipment and/or accessory manufacturer of such goods. When repairs or replacements are made under our warranty, all freight costs will be paid by the purchaser.

NIKKISO Pumps America, Inc. will not be responsible for the work performed by others. NIKKISO Pumps America, Inc. reserves the right to void applicable warranties if work by others is determined by NIKKISO Pumps America to be improperly executed or not required.

**Read this instruction manual before installing the valve.**

**Read this instruction completely before installing, operating or servicing  
NIKKISO HydroGarD™ Safety Relief Valves!**

**Always keep safety considerations foremost! Use proper tools, protective clothing  
and eye protection when working on NIKKISO Pumps America products. Install the  
equipment with a view toward assuring safe operation. Be extremely careful when  
working in the presence of hazardous sub**

# NIKKISIO HYDROGARD™

*Please read this instruction manual before installing safety relief valve.*

In this instruction manual, the **Note**, **CAUTION** and **WARNING** notations have the following meanings:

**Note:** This heading is used if a special feature or operating requirement is being pointed out.

**CAUTION:** This heading is used to denote when failure to follow the operating instructions as prescribed herein can lead to pump or system damage.

**WARNING:** *This heading is used to denote when failure to follow the operating instructions as prescribed herein could result in PERSONAL INJURY!*

## GENERAL DESCRIPTION

NIKKISIO HydroGarD™ safety relief valves are specifically designed for use with chemical metering and process pumps, and are engineered to provide an economical installation with easy in-line service capability.

Diaphragms are of chemically resistant PTFE or FKM material, and isolate and protect the internals from possible damage by the process fluid. Parts in contact with the process fluid are available in a wide range of materials, which are highly resistant to corrosion.

A unique plugged port in the bottom of the valve body can be utilized as a bleed or sample point, or for connecting a pressure gauge. Easy pump priming is also facilitated through this access port.

NIKKISIO HydroGarD™ SAFETY RELIEF valves protect the pump and associated equipment from damage that can result from overpressure.

## PRINCIPLE OF OPERATION

In the NIKKISIO HydroGarD™ safety relief valve, line pressure acts against the diaphragm isolated, spring-loaded ball check. When the line pressure exceeds the set pressure, the valve opens wide to relieve excess pressure and protect the pump and

drive from damage due to any blockages in the discharge system. A significant pressure drop is necessary to reseal the ball, and for normal operation to resume.

**CAUTION:** Safety relief valves require line pressure to drop to atmospheric pressure in order to reseal the valve.

## INSTALLATION INSTRUCTIONS

Each NIKKISIO HydroGarD™ valve is factory tested to assure proper, leak-free operation. Protective plastic caps are used to cover the port connections during shipment, and the valve is ready for installation.

### STORAGE

If the valve is not going to be installed immediately, the following steps must be taken.

1. Leave the valve in the original shipping carton.
2. Leave any plastic caps in place.
3. Store the valve indoors in a dry ambient atmosphere above 32° F.

### LOCATION

The valve installation site should provide easy access for adjustment and routine maintenance, and where possible to protect the valve from the elements and from leaks or drips from process equipment.

Refer to Figure 1 for a general overview of where the safety relief valve should be positioned in your pump system.

### PIPING

1. All piping to the valve should be supported to prevent stress on the valve connections.
2. Before installing, BE CERTAIN THAT ALL PIPING TO THE INLET SIDE OF THE VALVE IS COMPLETELY CLEAN BY FLUSHING THOROUGHLY. Failure to do so may result in foreign matter entering and damaging valve seat or diaphragm.
3. Care should be exercised when piping to plastic valves. The use of flexible connections is recommended.

## SAFETY RELIEF VALVE

1. The safety relief valve should be installed as near as possible to the discharge connection of the pump which the valve is to protect. The valve should always be installed upstream of any shutoff valve(s) in the discharge line in order to protect the pump if a shutoff valve should be inadvertently closed while the pump is in operation (see Figure 1).
2. When use with slurried, the valve must be installed in a tee fitting to prevent slurry buildup. A clean out tee on the outlet side of the valve is recommended.
3. Since the safety relief valve is a diaphragm type valve, it must be installed so that no back pressure is applied to the outlet. This means that the valve must be installed in such a way that it will be self-draining after operation.

The safety relief valve should not be used on the following applications:

1. On liquefied gas, where the outlet cannot be open to the atmosphere.
2. Where the outlet may be subjected to fluid pressure.
3. Across a pump (i.e.: should never be connected from the discharge side of a pump to the suction side of a pump).

## ADJUSTING SET PRESSURE

Safety relief valves are snap-acting, designed to open fully at set pressure regardless of flow. Safety relief valves are set at the factory to their specified operating pressure.

The valve setting can be easily changed in the field by removing the threaded plug (1001) on top of the bonnet (1002).

Install a pressure gauge by removing the port plug in the bottom of the valve body.

Using a 1/2" hex Allen wrench, rotate the adjuster (1004) clockwise to increase and counterclockwise to decrease the set pressure.

**Note:** When making pressure setting changes to your NIKKISO HydroGarD™ valve, carefully consider the effect the change(s) will have on the entire hydraulic system, including the pump.

**CAUTION:** Do not run pump with valve adjuster (1004) "bottomed out", as severe damage to pump may result!

Under no circumstance should the relief valve be set any higher than the pumps maximum design pressure.

**Note:** Metering pumps typically produce a pulsating flow with peak discharge pressures which are higher than average discharge pressures. For this reason, set the relief valve to open at a pressure approximately 25 psi or 20% higher than the peak discharge pressure, whichever is greater.

## MAINTENANCE INSTRUCTIONS

The design of the NIKKISO HydroGarD™ safety relief valve permits routine inspection and repair without removing the valve from the pipe line.

**CAUTION:** Before attempting any repairs, be certain that your NIKKISO HydroGarD™ valve is isolated from the process system.

## VALVE DISASSEMBLY

1. Wear suitable protective clothing and eye shielding for protection.
2. Remove the cap plug on top of bonnet and rotate adjuster counterclockwise until it is level with the top of the bonnet to relieve spring force.

Remove the bolts (1003) holding valve body to bonnet. Remove bonnet to make internal parts readily accessible for inspection and replacement.

**Note:** When removing bonnet from body, spring, spring seat and diaphragm may fall out.

## CLEANING VALVE PARTS

Metallic parts can be cleaned with mild solvent, while plastic part should be cleaned only in soap solution. Inspect diaphragm recess and clean before reassembly.

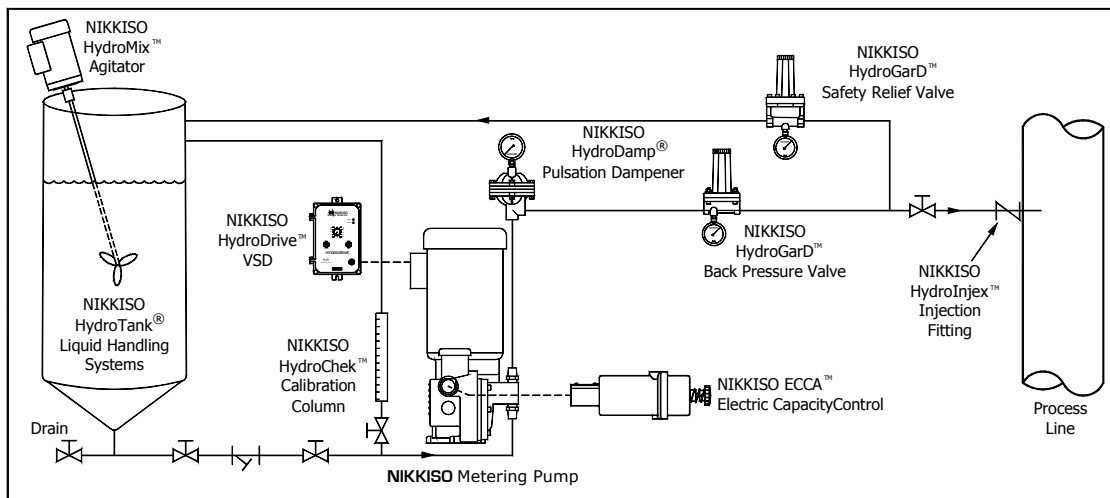
## REASSEMBLING SAFETY RELIEF VALVE

1. Install new diaphragm disc between spring seat (1006) and ball retainer (1015), concave\* side towards spring seat.
2. Install seat O-ring (1017) on seat and install seat into valve body.

# NIKKISO HYDROGARD™ SPECIFICATIONS

Maximum Set Pressure	Metallic	Plastic	Bolt Torque
Safety Relief Valve, all sizes	0-300 psig*	0-150 psig	
Safety Relief Valve, all sizes	301-1500 psig*	N/A	
Safety Relief Valve, 1/2" HP	1800 psig	N/A	
Safety Relief Valve, 1/2" HP	3000 psig	N/A	

\*Varies by spring range used



**Figure 1. Typical Metering Pump Installation**

3. Place ball on seat and carefully place diaphragm assembly with the ball retainer (1015) over the ball.
4. Install washer (1007) onto spring seat (1006). Place spring into washer.
5. Install bonnet (item 1002) over the spring in proper orientation, being careful not to dislodge ball off its seat.
6. Install bolts (1003) through plate (1014) with nuts (1013) and tighten evenly.
7. Reset the adjuster (1004) to the setting desired per instructions "adjustment of valves".

\*Due to method of manufacture, diaphragms are naturally curved.

**Note:** To prevent leakage, never reuse old diaphragm.

## PARTS ORDERING INSTRUCTIONS

Always have the complete NIKKISO HydroGarD™ valve model and serial number available when contacting NPA for parts or service. This model

number can be found on the data plate mounted on the back of the pump housing.

Should it be necessary to send the valve to the factory for repair or service, thoroughly flush unit of all process fluid, drain all hydraulic oil, and call factory for a return authorization number. A material safety data sheet (MSDS) will be required. Pumps returned without authorization number will not be accepted.

Direct all inquiries and orders to your local representative or directly to:

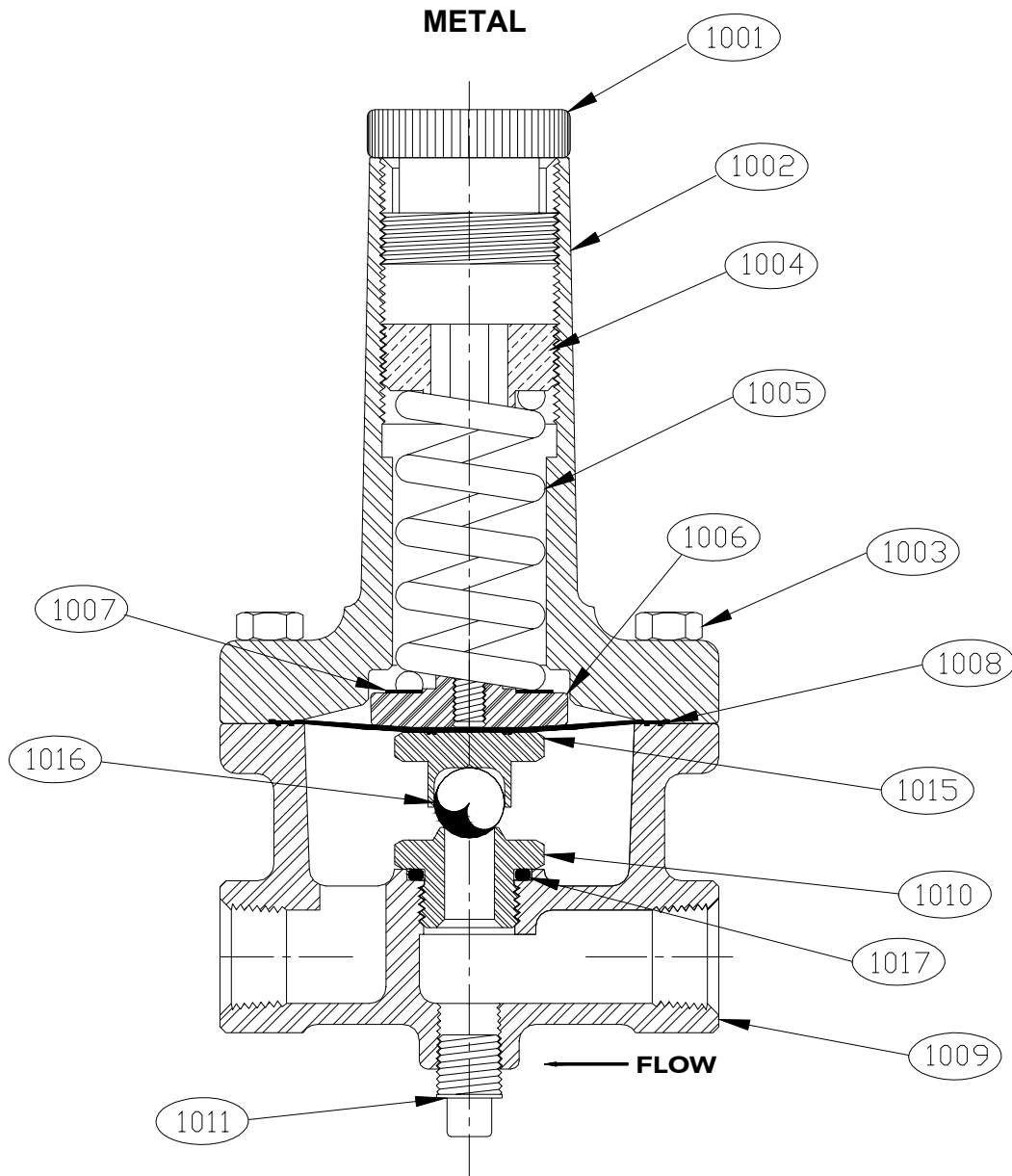
HYDROFLO® SAFETY RELIEF VALVE	
MODEL	14053-2741
PRESSURE	125 PSIG
MATERIAL	PVC/PTFE
SIZE	1/2" NPT
NIKKISO Pumps America, Inc. <a href="http://www.nikkisopumpsamerica.com">www.nikkisopumpsamerica.com</a>	

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# NIKKISO HYDROGARD™ SAFETY RELIEF VALVE SPARE PARTS LIST

Valve Model and Serial Number **MUST** be furnished to assure prompt and accurate parts service.

## 1/2" THRU 1" SAFETY RELIEF VALVE



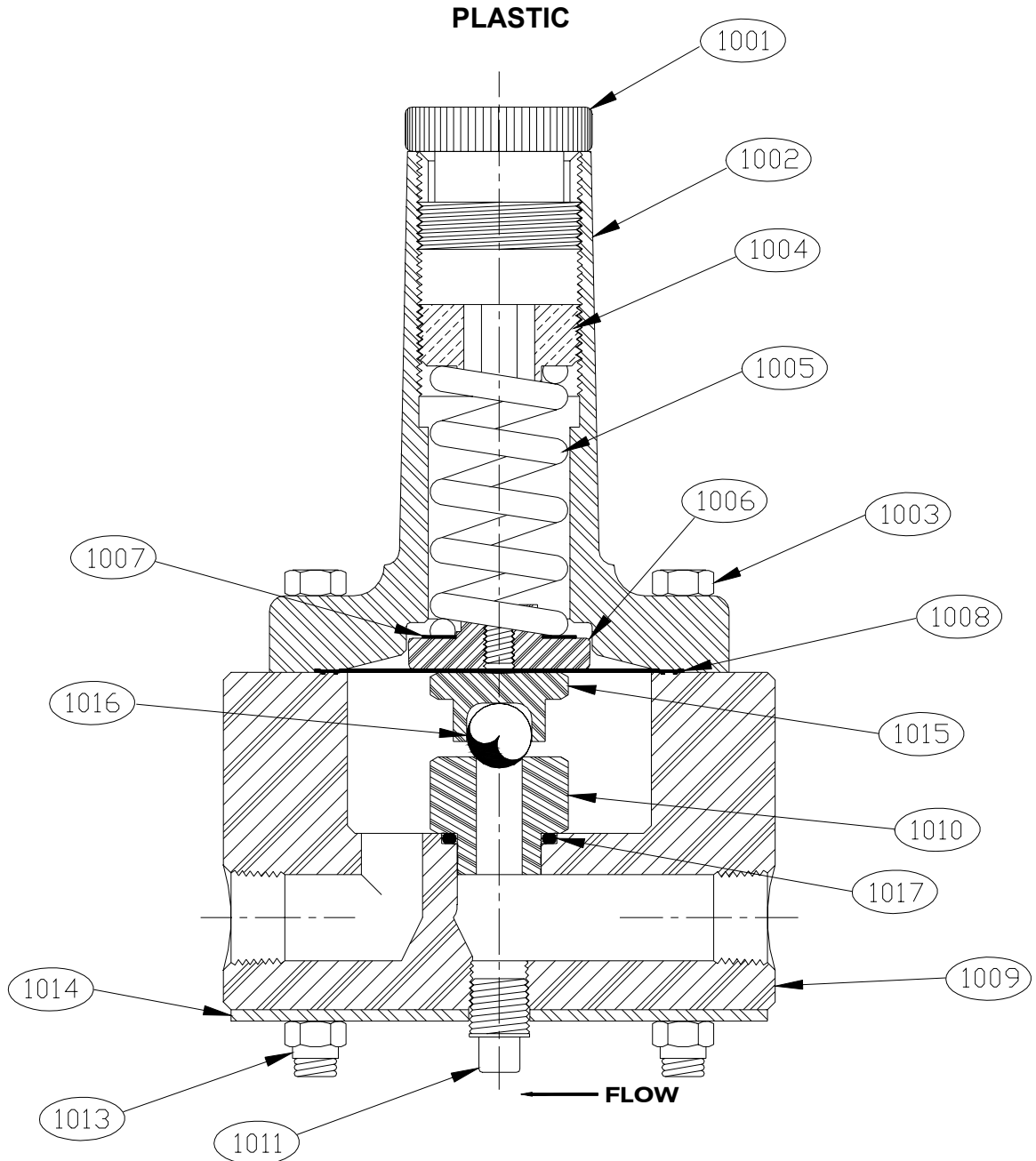
<b>Item</b>	<b>Description</b>	<b>Item</b>	<b>Description</b>
1001	Plug	1009	Valve Body
1002	Bonnet	1010*	Valve Seat
1003	Bolt	1011	Port Plug
1004	Adjuster	1013	Nut, Locking
1005	Spring	1014	Plate
1006	Seat, Spring	1015	Ball Retainer
1007	Washer	1016	Ball
1008*	Diaphragm	1017*	O-Ring

\*Denotes recommended Spare Parts.

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