

UniSim[®] PRS

Product Information Note

Your preferred process simulation suite now includes a pressure relief system design tool.

The Challenge

A properly sized and rated pressure relief system is one of the most important aspects for safe operation in plant assets in the process industries. In an emergency situation, such as power failure, cooling water failure, or fire in a plant, people's lives and millions of dollars' worth of assets could be destroyed if the pressure relief system is not properly designed.

The Solution – UniSim[®] PRS

UniSim[®] PRS (Pressure relief system) is a standalone tool for the sizing, rating and validation of relief devices and surrounding pipes. Originally developed by Honeywell UOP, it has been used to validate and certify all the Honeywell UOP plant assets, over the past few years. It is now commercialized under the UniSim[®] Design Suite and licensed under the Honeywell's Unified License Manager (ULM).

The Benefits

Accuracy of Prediction and Reduced Engineering Cost

UniSim[®] PRS has been extensively validated with proprietary data and has been used for the certification of all the plant assets of Honeywell UOP. Accuracy of prediction translates to accuracy in design, which ensures safety and at the same time minimizes CAPEX (increases profitability) for new or revamp projects.

Plant Lifecycle Validation & Certification

UniSim[®] PRS allows for existing design validation and certification of pressure relief systems for plant assets. It also minimizes the effort for future

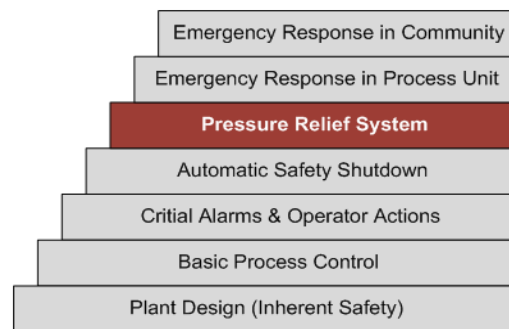


Figure 1. Process Protection Layers – Pressure Relief System is a critical layer.

Plant assets in the process industries are equipped with various layers of protection, to ensure the safety of life and equipment assets. The pressure relief system, which constitutes the ultimate layer of protection for process equipment, is set-off in the event of an abnormal process condition and only if the protection layers below it have failed.

Once installed, the pressure relief systems are rarely tested. This is mainly due to the environmental & economic impact of testing such systems; it is also not a requirement due to the presence of the other protection layers and the testing of the individual components of the pressure relief systems. So, it is imperative to get the process design for the pressure relief systems right.

FEATURES & BENEFITS

Easy-to-Use Tool

- Standalone tool.
- Sizing, rating and validation fields enabled depending on scenario.
- Intuitive workflow.
- Checks for compliance.
- Provides guided assistance for rating.
- Generates reports & datasheets.

Proven Technology

- UniSim PRS technology is:
- Accurate.
 - Fast.
 - Robust.
 - Proven – used for the validation / certification of thousands of relief devices.
 - MOC tool for revalidation & recertification of plant assets.

User-Centric

- Leveraging in-house process, control and software development expertise, we bring to market features:
- Developed with users.
 - For the users.
 - Adopting best practices & workflows recommended by the users.

Increased Efficiency

- Through elimination of manual data entry and automation of:
- Engineering workflow between tools.
 - Engineering documentation generation capabilities.
 - Export of multiple scenario / multiple relief device results into MS excel.

Lower CAPEX

- Through design optimization with:
- Incorporated industry standards.
 - Sizing, rating, and validation calculations.
 - Accuracy of prediction.
 - Validation with proprietary data.
 - Embedded engineering utilities.

re-validations and re-certifications of pressure relief systems under MOC.

Easier to Outsource Engineering Work

Wrapped with UniSim Thermo, UniSim® PRS runs as a standalone tool, by only reading specific UniSim Design export files. This is particularly useful for maintaining project control and compliance to standards, particularly when outsourcing pressure relief system process design work to specialist engineering companies. The specialist 3rd parties in turn benefit from a more contained engineering tool investment, as they only need the UniSim PRS tool to complete the pressure relief system engineering work.

Increased Engineering Effectiveness

The UniSim® PRS enables process design users to carry out their tasks more efficiently, through the unique features of compliance checking, guided assistance for rating, and embedded manufacturer model database; through report and datasheet generation capabilities; and through workflow integration with UniSim Flare. In addition, UniSim PRS simultaneously solves the relief device and piping calculations, which makes it faster to converge.

The Features

UniSim® PRS has the following features:

Compliance with industry standards

Follows the API/NFPA/ASME code requirements for pressure vessels and storage tanks:

- American Petroleum Institute (API) 520, 521, 526, 620, 650, 2000
- ASME Boiler and Pressure Vessel Code Section I and Section VIII, Division I
- ISO 4126
- NFPA 30

and CGA code requirements for portable containers:

- CGA S-1.2

API sizing scenarios

Allows API Sizing for:

- External Fire
- Blocked Outlet
- Flow Known
- Tube Failure
- Storage Tank Vent (non-fire)

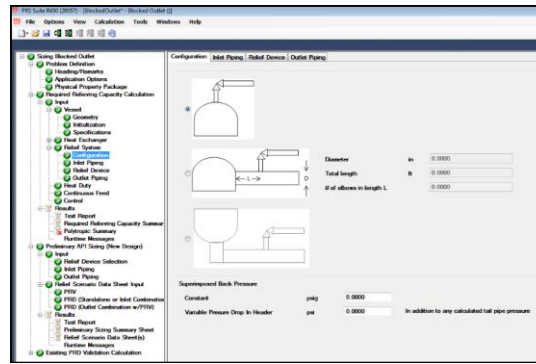


Figure 2. Sizing a PSV for a blocked vessel scenario using the UniSim® PRS tool.

Supported Relief Devices & Piping

Supports the following relief devices (and surrounding pipes):

- Pressure Relief Valves (PRVs)
- Rupture Disks (RDs)

for gas, liquid or mixed phase fluids (with or without partial disengagement). It also supports multiple devices and multi-diameter pipes.

Performance

Solves simultaneously the relief device and piping calculations, so cases converge fast.

Guided Assistance

Runs checks for compliance with industry standards and provides guided assistance for rating, to get the design right the first time.

Documentation Generation

Generates engineering documentation, such as:

- comprehensive reports per scenario
- relief device datasheets
- multiple scenario/relief device result export to MS excel

Integrated Fluid Properties

Is wrapped with UniSim Thermo, which makes it a standalone tool, compatible with UniSim Design and UniSim Flare.

Embedded Engineering Utilities

It includes the following useful engineering utilities:

- Crane K Loss calculator (pipe fitting)
- Vendor Capacity Calculator (area & Kd)
- PRV Manufacturer Database

UniSim® PRS allows for the sizing, rating and validation of pressure relief devices and inlet/outlet pipes. It incorporates overpressure protection industry standards and features that increase engineering effectiveness. Its accuracy is proven: it has been used for the validation and certification of thousands of relief devices across all Honeywell UOP plant assets.

UniSim® Design Suite

Honeywell's UniSim Design Suite, is part of the UniSim software family of online and off-line process design and optimization applications. Giving users the power to determine process workflows, equipment sizing and rating requirements, UniSim solutions help you capture and share process knowledge, improve plant profitability and maximize returns on investments in simulation technology.

UniSim Design Suite offers:

- An integrated steady-state and dynamics environment to easily re-use, update and transition the process models throughout a project or plant asset lifecycle.
- A user-friendly interface which helps engineers to easily access and visualize the process information and identify trends.
- Built-in industry standards that minimize the need for literature search when sizing and rating equipment.
- Integration with 3rd party specialty technologies which allow for the best technical solution for process simulation.
- Interfacing capabilities with process historians, DCS & safety systems, and other advanced applications that maximize the benefits for green-field, brown-field and revamp projects.

UniSim Design Suite Support Services

This product comes with worldwide, premium support services through our Benefits Guardianship Program (BGP). BGP is designed to help our customers improve and extend the usage of their applications and the benefits they deliver, ultimately maintaining and safeguarding their advanced applications.

Honeywell provides a complete portfolio of service offerings to extend the life of your plant and provide a cost-effective path forward to the latest application technology. Honeywell services include:

- Standard and Customized Training
- Consulting
- Model Building
- Engineering Studies
- Custom Thermo/Unit Operations

For More Information

Learn more about how Honeywell's UniSim Design Suite can improve process design, visit www.hwi.co/uniSimDesign or contact your Honeywell Account Manager or authorized distributor.

Honeywell Process Solutions

1250 West Sam Houston Parkway South
Houston, TX 77042

Honeywell House, Arlington Business Park
Bracknell, Berkshire, England RG12 1EB UK

Shanghai City Centre, 100 Zunyi Road
Shanghai, China 200051

www.honeywellprocess.com

PIN-16-34-ENG
November 2016
© 2016 Honeywell
International Inc.

Honeywell® and UniSim® are registered trademarks of Honeywell International Inc. Other brand or product names are trademarks of their respective owners.