CONTROVAL

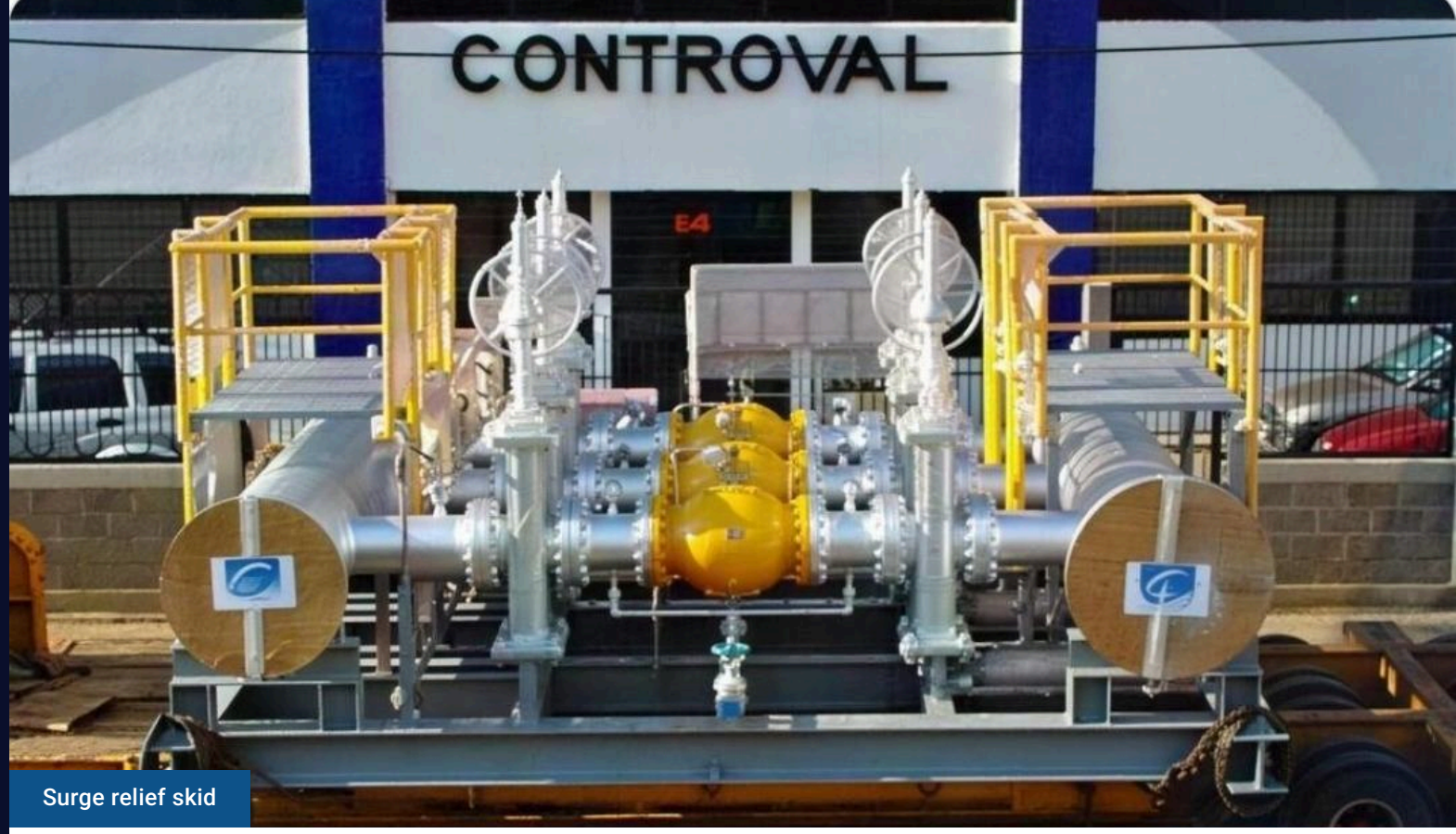
TECHNICAL DATA SHEET

PROTECTION AND PROCESS

Surge relief

Protect your pipeline from water hammer and overpressure.

WATER HAMMER · RELIEF VALVES · SURGE TANK · SCADA



Surge relief skid

AT A GLANCE

Protect the pipeline from water hammer.

01
Protects against water hammer and overpressure

02
Relief valves and controls on one skid

03
Built and tested in our workshops

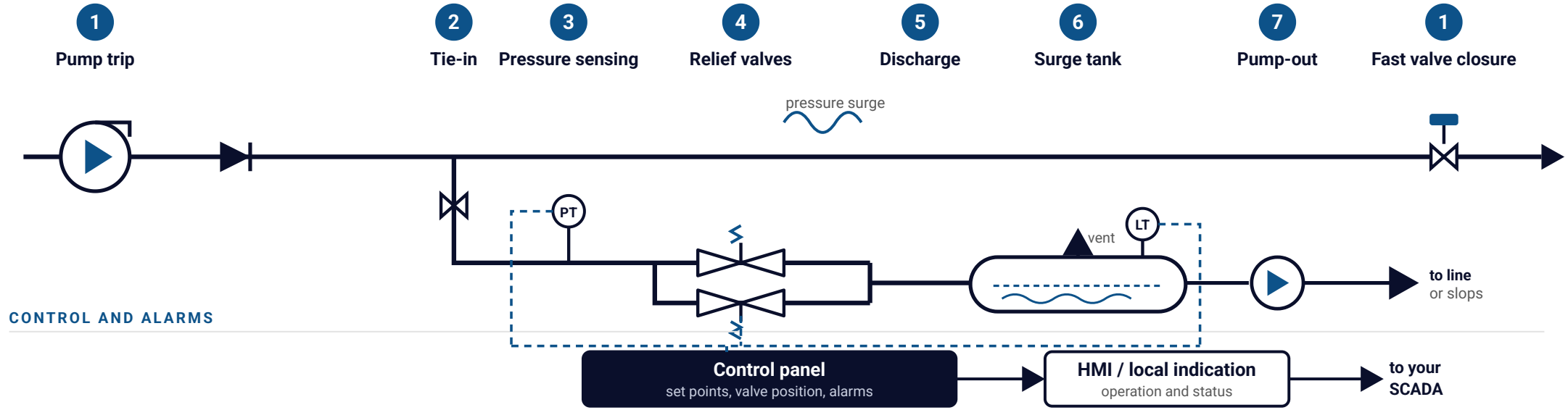
04
Designed to ASTM, ASME, ISO and API standards

How it works

When a pump trips or a valve closes fast, a pressure surge travels through the line. A surge relief skid releases that pressure before it damages the pipeline.

We build the skid in our workshops, with relief valves and controls sized for your line.

Water hammer, also known as the Joukowsky (Zhukovsky) pulse, is a transient caused by changes in fluid velocity and is the main cause of damage to hydraulic systems. Uncontrolled, it can break the pipe by overpressure or by depression and cause serious operating problems. Our skids protect pipes, pumps, vessels and valves, and are designed to your process conditions.



Typical schematic configuration, shown for reference only. The final design, equipment, instrumentation and applicable codes depend on the client's process conditions, specification and project requirements, and are defined during engineering.

Step by step

In the order the fluid passes through it.

1 Surge source
A pump trip or a fast valve closure stops the flow suddenly and sends a pressure wave through the line: water hammer.

2 Tie-in and isolation
The skid connects to the line through an isolation valve, so the equipment can be isolated for maintenance.

3 Pressure sensing
Pressure transmitters and gauges monitor line pressure and report to the control panel. Relief set points are based on the line limits.

4 Relief valves
When pressure rises above the set point, the valves open fast and release the surge volume. They reseat when pressure falls.

5 Discharge header
The released liquid is collected in a discharge header sized for the relieving flow and the allowed back pressure.

6 Surge tank
The surge volume is diverted to a tank, with level monitoring and vent, or to the destination defined for the project.

7 Pump-out and return
Once the event is over, a pump returns the liquid to the line or sends it to slops, and the tank is ready again.

8 Line restored
Valves reseat, pressure returns to normal and the line keeps running without damage to pipe, pumps or valves.

▶ CONTROL AND RECORDS

Control panel and SCADA
The panel shows pressure, level and valve position, raises alarms and sends data to your SCADA.



Surge relief skid lifted into place, José terminal
The skid, with its vessel and platform, lifted by crane onto its foundations.

Typical configurations and options

Relief valve type	Spring-loaded, pilot-operated or control valve, per the surge study
Number of valves	One or several in parallel; spare valve or duty / standby
Sizing and set points	From your line data, MAOP and surge study
Pressure sensing	Pressure transmitters and local gauges
Discharge	Header to a tank, a return line or slops, as the project defines
Surge tank	Optional tank with level monitoring and vent
Pump-out	Pump to return the liquid to the line or to slops
Isolation	Block valves for maintenance of the relief valves
Controls	Panel with alarms and valve position monitoring; signals to your SCADA
Materials	Carbon steel or stainless steel; NACE materials for sour service
Area classification	Instruments, panels and wiring selected for the classified area
Mounting	Skid-mounted, ready to lift and transport
Valve and instrument brands	We integrate Farris, Flowserve, Samson, Mokveld, Westlock, Yokogawa and Swagelok, and consider your preference



Surge relief skid being set at the terminal, Vepica-Ameriven

Installation of the water hammer protection skid at the loading terminal.

Standards and documentation

Designed to ASTM, ASME, ISO and API standards. The applicable codes are agreed per project.

TYPICAL REFERENCES

API 520	Sizing, selection and installation of relief devices
API 521	Pressure-relieving and depressuring systems
API 526	Flanged steel pressure-relief valves
API 2000	Venting atmospheric and low-pressure storage tanks
ASME B31.4	Pipeline transportation systems for liquids
ASME B31.3	Process piping
ASME VIII-1	Pressure vessels, including the surge tank if pressurized

TYPICAL DOCUMENTATION PACKAGE

- ✓ P&ID
- ✓ General arrangement
- ✓ Relief valve datasheets and sizing calculations
- ✓ Instrument datasheets
- ✓ FAT procedure and report
- ✓ Operation and maintenance manual

> Factory acceptance test (FAT) in our workshops and site acceptance test (SAT) at the installation site.

Our work

A selection of surge relief skids we have built



Surge relief skid leaving our facility, José terminal (Vepica)

Complete skid on a trailer in front of our workshop, ready for transport to the terminal.

Real projects, photographed in our workshops and at site. Ask us for references in your application.

DELIVERED

Diluent injection and surge relief skids, José terminal	**Ameriven / Vepica**

Need one built for your process?

controval.com

Send us fluid, flow, pressure and temperature, or just your idea. An engineer returns a proposed configuration.

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