



Q2 SERIES: DECENTRALIZED VPS

Maximum safety, minimum complexity

Introduction

The Q2 is Contrive's fully parametric burner controller, designed for safe and flexible management of industrial combustion systems and is certified SIL 3 according to IEC 61508.

The Q26 and Q28 versions integrate a Valve Proving System (VPS).

Limitations of Centralized VPS

In the industrial combustion sector, safety is a non-negotiable requirement.

Standards such as EN ISO 13577-2, EN 676, and NFPA 86 impose rigorous leak testing for high-power burner valves. However, the conventional approach often involves placing the Valve Proving System (VPS) on the main gas train. This method has an inherent limitation: it verifies the tightness of the common gas train but cannot guarantee the specific safety of the pipework and valves for each individual burner.

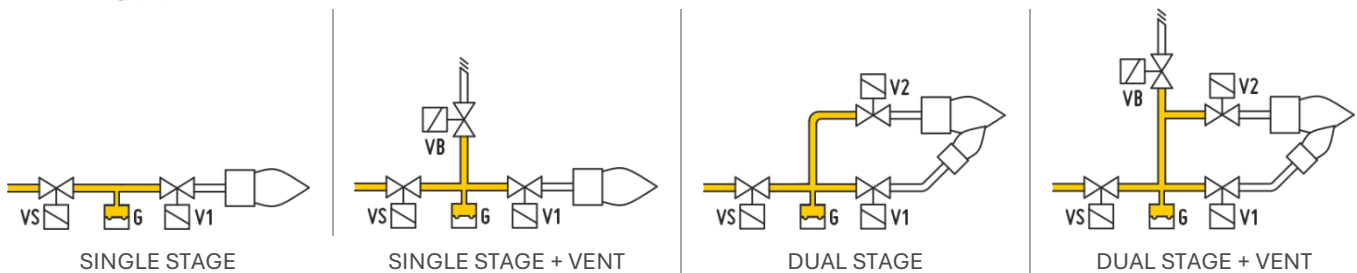
The Q2 Solution: Individual Safety Without Additional Components

Thanks to their flexible architecture, the Q26 and Q28 controllers enable granular control over every single burner, using just the components already required by regulations:

- **Existing Hardware Utilization:** standards mandate two shut-off valves in series on each fuel line. The Q2 uses the pipe volume between these two valves as the test chamber for leak proving, with no need for additional components.
- **Intelligent Integration:** by positioning the gas pressure switch between the safety valve (upstream) and the burner valve (downstream), the necessary test volume is obtained while simultaneously maintaining minimum supply pressure monitoring — all without adding costs or system complexity.

Adaptability to Different Configurations

The Q2 is completely parametric and can be configured to fit any burner layout. Beyond the four typical configurations, multiple downstream valves can be managed; tightness will be verified for all valves and the connecting pipework.



Dual Role of the Pressure Switch

All test cycle times (filling, emptying, and waiting) can be individually modified.

This allows a single fuel pressure switch to perform two distinct functions:

1. **VPS (Leakage Control):** The pressure switch detects pressure variations in the volume under test. This can be activated:
 - a. at burner start (before the pre-purge),
 - b. after a controlled shutdown, lockout or failure (before post-purge),
 - c. both, before the startup and after the shutdown of the burner.
2. **Minimum Pressure:** During normal operation, the pressure switch constantly monitors the minimum supply pressure.

Positioning the switch downstream of the main safety valve and upstream of the burner valves ensures:

- Simplified plant engineering
- Improved safety through continuous cross-checking between valve status and pressure switch feedback

Full compliance with EN ISO 13577-4:2022 (4.3.4 and 4.3.5) requirements for reliable pressure detection.

Pressure Switch Trigger Threshold

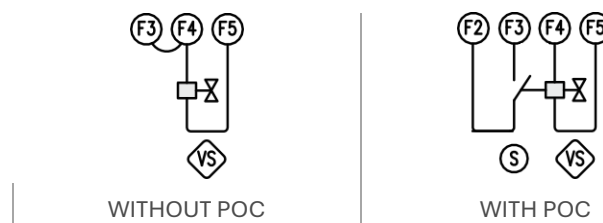
Typically, the pressure switch for leak testing is calibrated to 50% of the inlet pressure (P_u).

If a higher threshold is required for minimum pressure detection, the test times can be differentiated: increase the upstream valve test time and reduce the downstream valve(s) test time to ensure the minimum leak detection rate required by EN 1643.

Proof of Closure

The F3 terminal of the Q2 is used to verify the upstream valve (VS) output:

- Without POC:
F3 is connected directly to terminal F4, the feedback is based on the electrical status of the output.
- With POC:
For applications subject to NFPA 85, NFPA 86, and for applications described in EN ISO 13577-2, an integrated limit switch (S) can be connected to terminal F3 to confirm the mechanical closure of the valve. It is also possible to specify the maximum time within which the limit switch must activate, useful for slow-opening valves.
This option can be used simultaneously with VPS.



Safety Certification

The Q2 system is SIL 3 certified (Safety Integrity Level 3) according to IEC 61508. This certification covers the complete safety chain including the decentralized VPS function, ensuring the highest level of integrity for safety-related burner control applications.

Frequently Asked Questions

Why should I prefer the Q2 system over a traditional VPS on the gas train?

A VPS on the common train tells you if the train "leaks," but provides no certainty regarding individual burners. With Q2, you verify the safety of every single combustion point. It is a more granular and secure control that requires no additional solenoid valves.

Is it difficult to configure test times if I change the pressure switch calibration?

Not at all. You can modify the configuration using the free Q.Suite software, following the tables provided in the documentation. Q.Suite also includes a utility for automatically calculating test times based on the volume of valves and pipes.

Is using one pressure switch for two functions truly safe?

Yes. The Q2 manages the two functions at different stages of the cycle: leak testing occurs before pre-purging and/or after shutdown, while the minimum pressure function is active during burner operation. This approach is fully compliant with international standards and reduces potential failure points. Furthermore, the Q2 system is SIL3 certified (Safety Integrity Level 3) according to IEC 61508.

Download Q.Suite and evaluate the flexibility of Q2 for yourself:

www.burner-control.com

For more information, contact our technical team:

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