

VPS 504 S06 and S05 Valve Proving System Installation Instructions



SPECIFICATIONS

VPS The Valve Proving System VPS 504 checks that both safety shutoff valves in a Dual Modular Valve (DMV) are closed before either a system start-up or after shutdown when wired and interlocked with a suitable flame monitoring relay. The VPS 504 will halt the start-up sequence to a burner if it detects an open or damaged safety shutoff valve, thus preventing ignition under potentially dangerous conditions.

Gases

Natural gas, air and other inert gases. NOT suitable for butane or any gas mixture containing 60% or more of butane.

Maximum Operating Pressure

7 PSI (500 mbar)

Maximum Body Pressure

15 PSI (1000 mbar)

Ambient / Fluid Operating Temperature

5 °F to +140 °F (-15 °C to +60 °C)

Electrical Input Rating

120 Vac / 60 Hz for S06 Series and 24Vdc for S05 Series

Power Rating (consumption)

Valve proving 60VA

In operation 17 VA

Switch Output Rating

S06 Series: Run (T5) 4A and Alarm (T3) 1A @ 120 Vac

S05 Series: Run (TB) 4A and Alarm (TS) 1A @ 24Vdc

Enclosure Rating

NEMA Type 12

Electrical Connection

Screw terminals with 1/2" NPT conduit connection

Operating Time

100 % duty cycle; maximum 20 test cycles per hour

Test Volume

Less than 0.14 ft³

Release Period (time to get a RUN or ALARM)

~10 sec. for test volume < 0.5 ft³

>10 sec.(max.26s) for test volume > 0.5 ft³

Detection Limit for Natural Gas (each valve)

Less than 1.76ft³/h (0.2-1.0ft³/h through both valves)

Materials in Contact with Gas

Housing: Aluminum

Seals: NBR-based rubber

Mounting Position

Vertically upright to horizontal

Test Ports

One inlet test nipple and one outlet test nipple

Approvals

CSA Certified: File # 1637485 (series S05 & S06)

UL Recognized: File # MN 17004 (S06 only)

FM Approved: File # J.I. 3004006 (7411) (S06 only)

New York City: File # MEA 57-05-E (S06 only)

Commonwealth of Massachusetts Approved Product:

Approval code G1-1107-35



ATTENTION

- Read these instructions carefully.
- Failure to follow them and/or improper installation may cause explosion, property damage and injuries.
- Installation must be done with the supervision of a licensed burner technician.
- The system must meet all applicable national and local code requirements such as but not limited to NFPA 86, NFPA 85, Swiss Re (formerly IRI), or CSA B149.3.
- Check the ratings in the specifications to make sure that they are suitable for your application.
- Never perform work if gas pressure or power is applied, or in the presence of an open flame.
- Once installed, perform a complete checkout including leak testing.
- Verify proper operation after servicing.
- Keep free of vibration

Karl Dungs, Inc

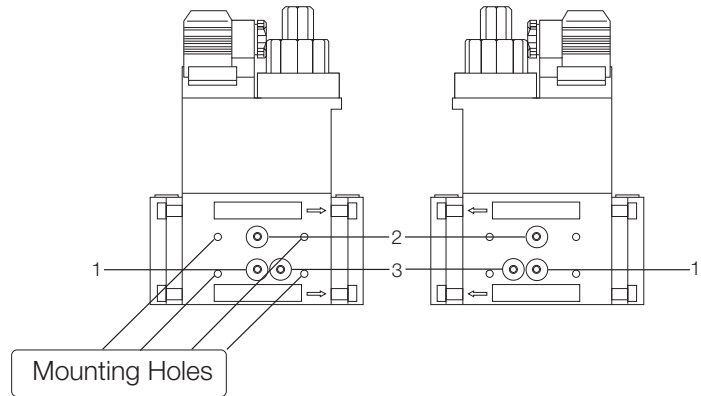
524 Apollo Drive, Suite 10 Lino Lakes, MN 55014 U.S.A.

Phone: (651) 792-8912 Fax: (651) 792-8919 E-mail: info@karldungsusa.com

MOUNTING POSITIONS

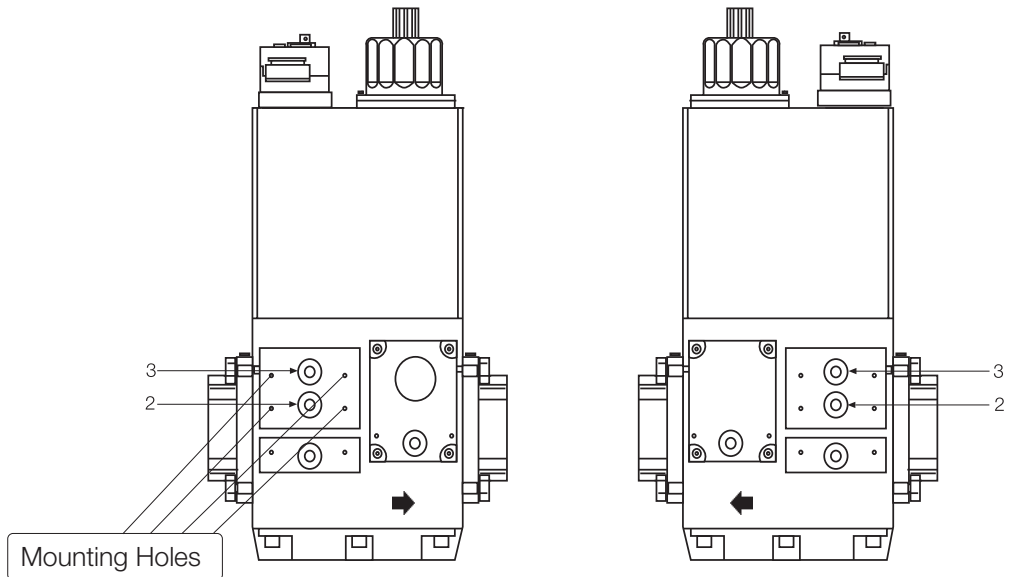
Location for DMV 7xx series

The VPS 504 is to be mounted directly to either side of the DMV to ports 1 and 2.



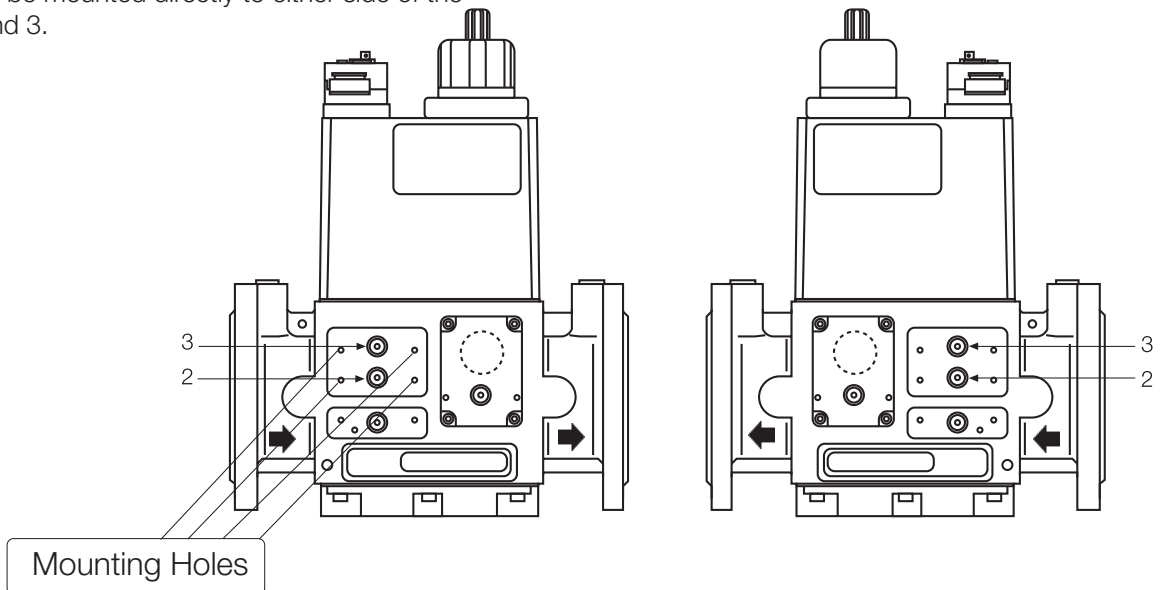
Location for DMV 525 Series

The VPS 504 is to be mounted directly to either side of the DMV to ports 2 and 3.



Location for DMV 5xxx Flanged Series

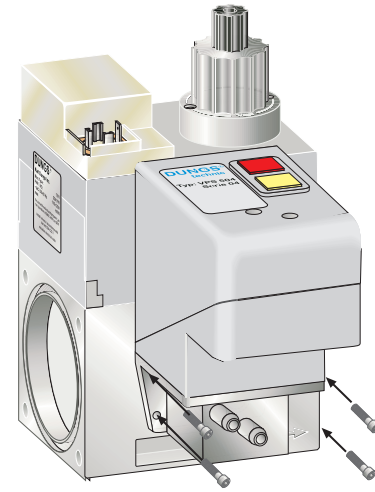
The VPS 504 is to be mounted directly to either side of the DMV to ports 2 and 3.



MOUNTING VPS 504 TO DMV SHUTOFF VALVE

Recommended Mounting Procedure

- Shut off the gas supply and disconnect all power to the DMV and the VPS 504 to prevent shock and equipment damage.
- Verify the 10.5 x 2.25 mm O-rings are fitted into the grooves on the back of the VPS 504.
- Verify that the O-rings are clean and in good condition.
- Remove the G 1/8 plugs from port 1 and port 2 of the valve with a 3 mm hex key wrench.
- Verify that the surface is clean and in good condition. Clean if necessary.
- Use the M 4 x 15 mm self tapping hex head screws supplied to mount the VPS 504 to the DMV valve body. **DO NOT** Exceed 22 lb-in of Torque.
- Verify that the O-rings are located in the grooves form a complete leak test to verify that no leakage occurs around the O-rings.



Do not adjust or remove any screws or bolts which are sealed with a Red or Blue colored compound. Doing so will void all approvals and warranties.

WIRING

- Use 14 or 16 gauge wire rated for 95°C(200°F).
- Disconnect all power to the VPS 504 before beginning the wiring to prevent electrical shock and equipment damage.
- Do not exceed the terminal ratings given in the specifications and on the VPS 504.
- Remove the black cap on top of the VPS 504.
- Loosen the screw which secures the gray cover and remove.
- Attach 1/2" NPT conduit to the black conduit adapter.
- Route the wires through the conduit connector.
- Connect the wiring to the appropriate screw terminals on the terminal strip.
- Replace the gray cover, the screw, and the black cap.
- A typical wiring diagram for operating the VPS 504 on burner start-up only is shown below.

Accessory: CM 100 or CM 101(For VPS 504 S06 ONLY)
The DUNGS CM 100 and CM 101 incorporate the relays and logic necessary to operate the VPS 504 on a system start up and after shutdown when wired and interlocked with a suitable flame safeguard control. When the VPS is integrated with the CM 100 or CM 101, Swiss Re (formerly IRI) would allow the VPS to be used in lieu of a vent line.



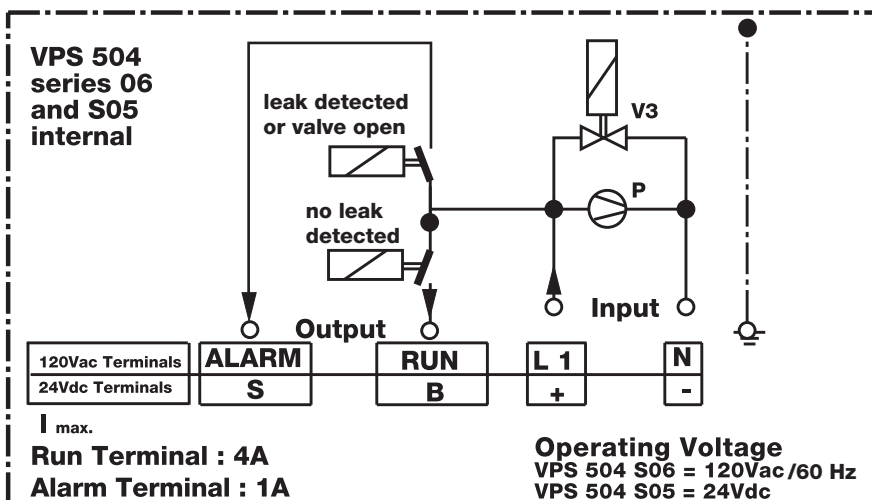
All wiring must comply with local electrical codes, ordinances and regulations.



Operating voltage for the S06 series is 120Vac 60Hz. NOT suitable for 50Hz.



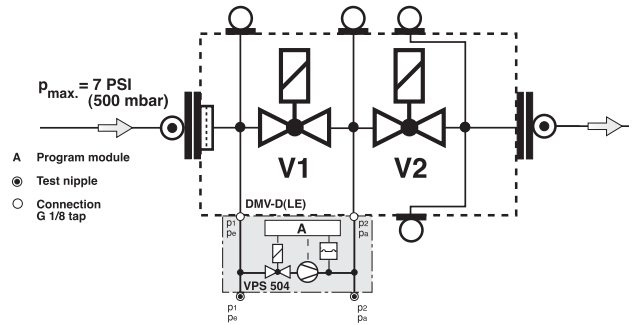
Frequency converters with insufficient shielding can cause faults in the VPS 504 as the result of transients. Verify that the equipment is provided with sufficient shielding.



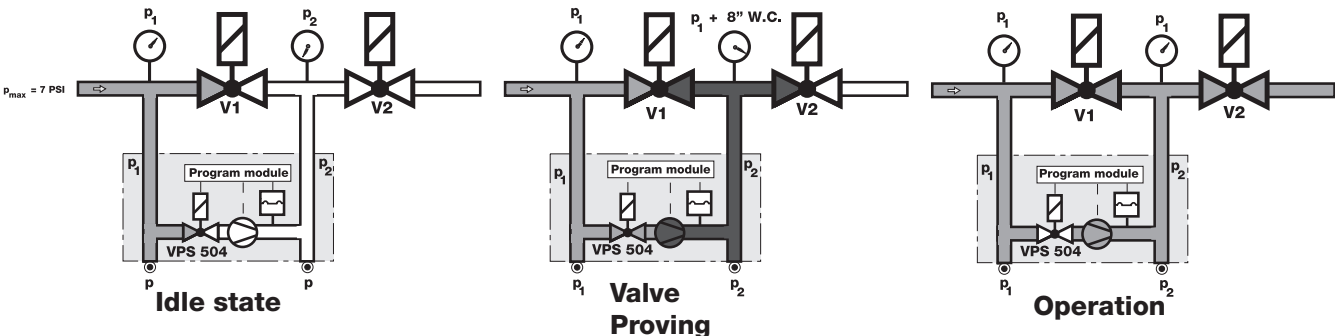
OPERATION

Functional description

The VPS 504 proves the integrity and the effective closure of the valve seats by pumping gas from upstream of the main safety valve to the volume between the two safety shutoff valves and detecting leakage. The VPS 504 proves the valves as soon as power is applied. Valve proving must be wired to prove on each start-up. In addition, the VPS can be wired to prove after normal shut-down and after a safety shut-down when integrated with the CM 100 or CM 101 control module. This allows the VPS 504 S06 to be used in lieu of a vent valve when accepted by the authority having jurisdiction.



Program sequence



Idle state: Valves 1 and 2 are closed.

Valve proving: The internal pump pumps gas pressure from upstream the first safety valve, p_1 , to the volume between the two safety shut-off valves, p_2 , increases approx. 8 in. W.C. above p_1 .

During the test period, the internal differential pressure switch monitors the pressure between the two safety valves.

If p_2 increases approx. 8 in. W.C. above p_1 , the motor pump is switched off (end of test period) indicating no leak is detected. The contact "RUN" (T5) is energized after 26 s max. and the yellow signal lamp lights continuously. (For 24Vdc models, the B terminal is energized)

If p_2 does not increase approx. 8 in. W.C. above p_1 , the motor pump is switched off (end of test period) as a leak is detected. The contact "ALARM" (T3) is then energized after about 26 s, and the red signal lamp

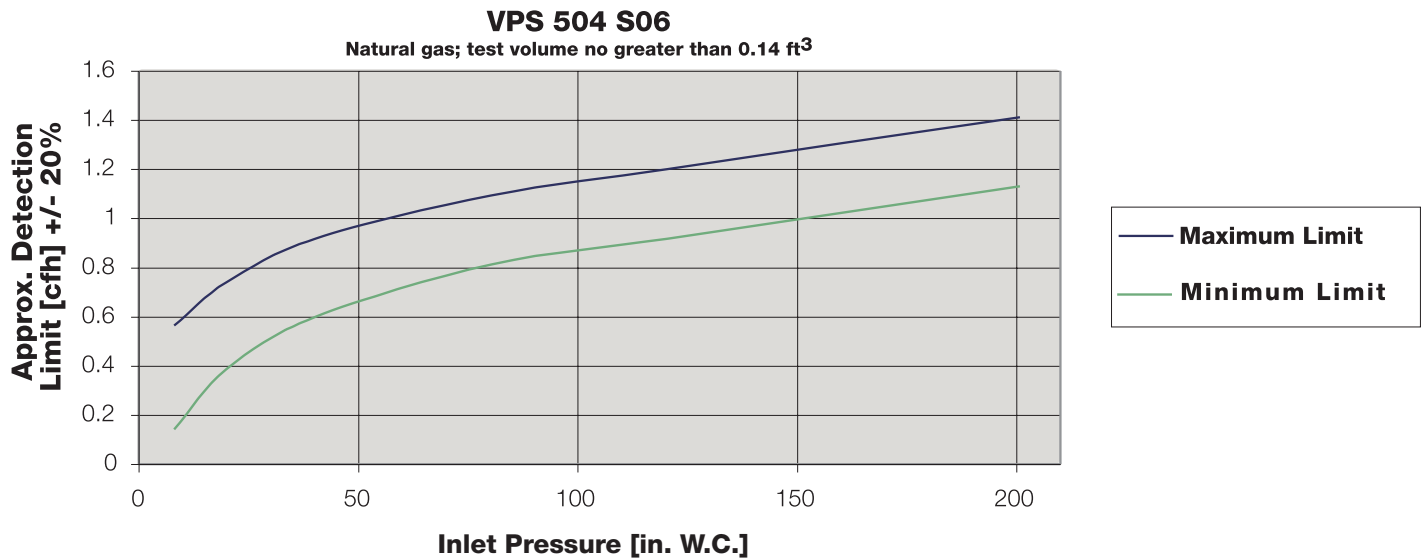
lights continuously. (For 24Vdc models, the S terminal is energized)

The release time (10 - 20 s) depends on the test volume (max. 0.14 ft³) and input pressure (max. 200 in. W.C.) In the case of short-term voltage failure during test or burner operation, an automatic restart is performed.

Operation

VPS pump remains off. "RUN" contact remains energized.

LEAK DETECTION LIMIT FOR EACH VALVE



NOTE: Leak detection limit depends on inlet pressure and gas density. To obtain detectable leakage through both valves, divide values in graph by 1.6.

MAINTENANCE

CAUTION: Verify that both safety shutoff valves are de-energized and closed prior testing the VPS 504.

NOTE: The VPS 504 is a protective device. Check it at least annually for proper operation.

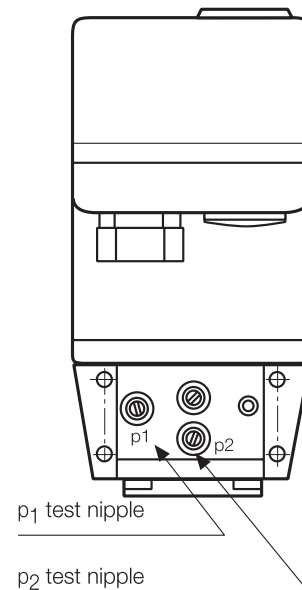
CAUTION: All test ports must be properly tightened before any gas is reapplied to the system.

CAUTION: If the VPS 504 is defective, do not try to repair the unit. Doing so might interfere with its normal operation and cause a fire or explosion. If disassembled, approvals, warranty, and exchange policies will be void.

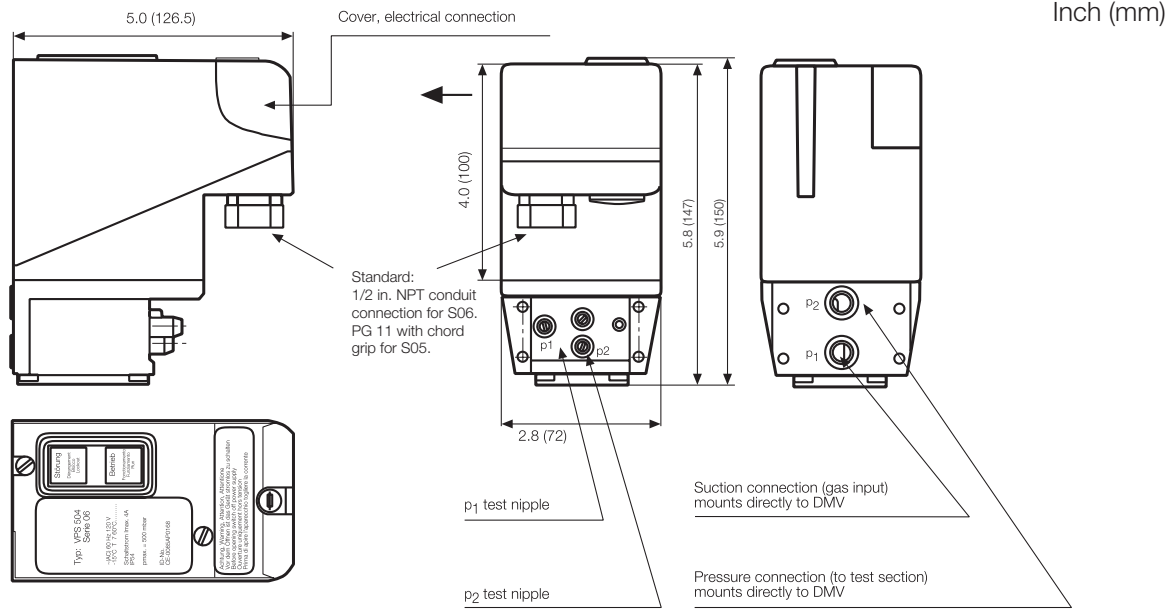
Test Procedure

1. Loosen test nipple p2. Confirm that gas is not continuously leaking from p2 by applying soapy water to the p2 test port. If bubble continue, perform a leakage test on teh valve seats.
2. Close test nipple p2, and then simulate a leak by removing test tap at port #2 from the DMV safety shutoff valve on the opposite side of the VPS. With power to the VPS 504, **and the upstream ball valve opened**, reset the VPS 504 by pressing the red lockout button. Confirm that after the VPS 504 stops pumping, the red light illuminates, and the VPS 504 locks out. (Terminal T3 on S06 series or terminal S on S05 series is energized.)
3. If test procedure 1 or 2 fails, immediately shut down the system, remove, and replace the VPS 504.

Note: When the internal pump in the VPS 504 is running, a small amount of gas will flow from port #2 of the DMV.



DIMENSIONS AND PART NUMBERS



Version

Order No.

Version

Order No.

VPS 504 S06 (120Vac 60Hz)

221-073

mounting kit

164-760

VPS 504 S05 (24Vdc)

224-983

(4 mounting screws)

Accessory

Order No.

CM 100 with enclosure (120Vac)

46022

CM 101 panel mount (120Vac)

46023