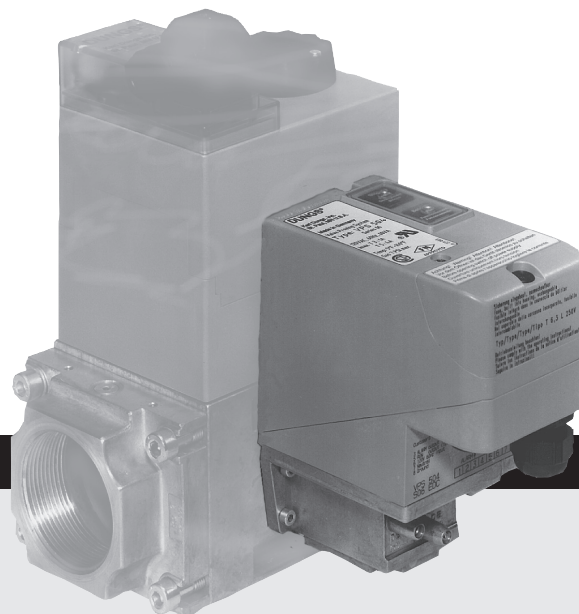


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Approvals



UL Listed
File # MH 62766 Sec2 (S06); Sec3 (S02, S05)



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

New York City: File # MEA 51-05-E (S06 only)

Commonwealth of Massachusetts Approved Product Approval code G1-1107-35

Attention



The installation and maintenance of this product must be done under the supervision of an experienced and trained specialist. Never perform work if gas pressure or power is applied, or in the presence of an open flame.



Check the ratings in the specifications to verify that they are suitable for your application.



Please read the instruction before installing or operating. Keep the instruction in a safe place. You find the instruction also at www.dungs.com. If these instructions are not heeded, the result may be personal injury or damage to property.



On completion of work on the valve proving system, perform a leakage and function test.



Any adjustment and application-specific adjustment values must be made in accordance with the equipment manufacturers instructions.



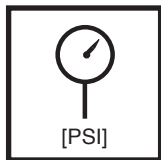
This product is intended for installations covered by, but not limited to, the following codes and standards: NFPA 86, NFPA 85, Swiss Re (formerly IRI) or CSA B149.3.

Explanation of symbols

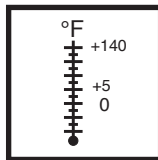
1, 2, 3 ... = Action
• = Instruction

Specification

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.



Max. Operating Pressure (MOP)
7 PSI (500 mbar)
Max. Body Pressure
15 PSI (1000 mbar)



Ambient / Fluid Temperature
+5 °F to +140 °F
(-15 °C to +60 °C)



Electrical Input Ratings
 U_n ~ (AC) 120 V -15 % / +10 % 60 Hz
for S06 Series and 24 VDC for S05
and S02 Series

Power Rating (consumption)

Valve proving 60 VA

In operation 17 VA

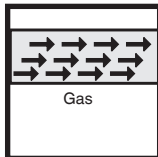
Switch Output Ratings

S06 Series:

RUN (T5) 4 A and ALARM (T3) 1 A
@ 120 VAC

S05 and S02 Series:

RUN (TB) 4 A and ALARM (TS) 1 A
@ 24 VDC



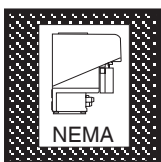
Gases

Dry, natural gas, air and other inert gases. NOT suitable for butane or any gas mixture containing 60 % or more of butane. A "dry" gas has a dew point lower than +15 °F and its relative humidity is less than 60 %.

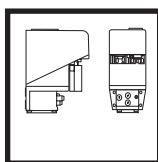
Materials in Contact with Gas

Housing: Aluminum

Seals: NBR-based rubber



Enclosure Rating
NEMA 12
IEC 529 / NEMA 250



Operating Time

100 % duty cycle; Maximum 20 test cycles per hour

Release Period (time to get a RUN or ALARM)

~10 sec. for test volume < 0.05 ft³

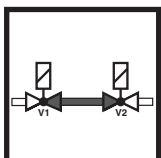
>10 sec. (max. 36 s) for test volume > 0.05 ft³

Detection Limits of Natural Gas (each valve)

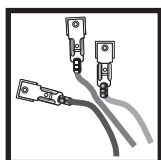
Less than 1.76 ft³/h (0.2-1.0 ft³/h through both valves)

Max. numbers of test cycles: 20/h

Wait for at least 2 minutes after carrying out more than 3 consecutive test cycles.



Test Volume
Less than 0.14 ft³

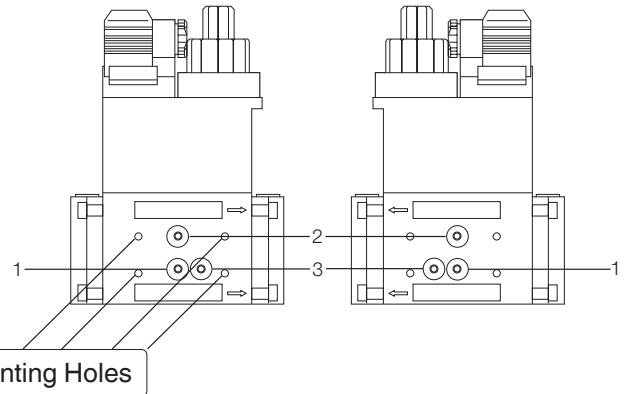


Electrical Connection
Screw terminals with 1/2" NPT conduit connection

Mounting Positions

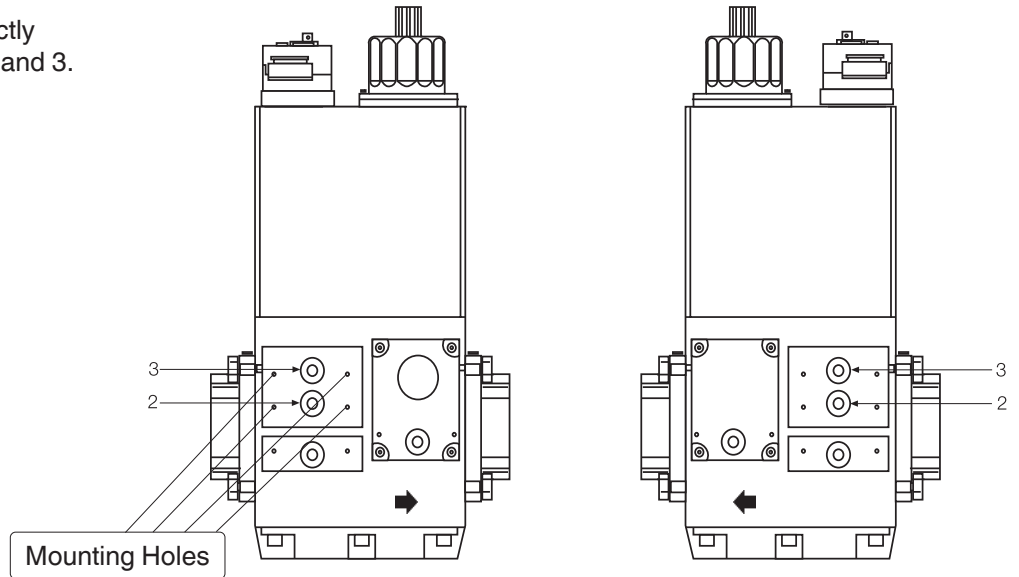
Location for DMV 7xx series

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



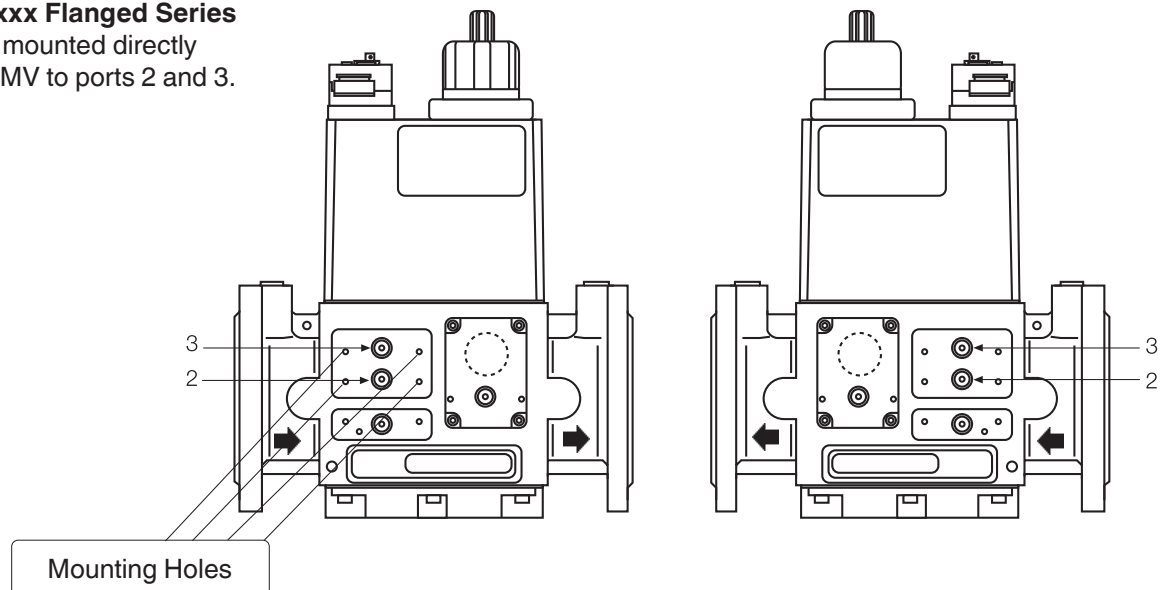
Location for DMV 525 Series

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

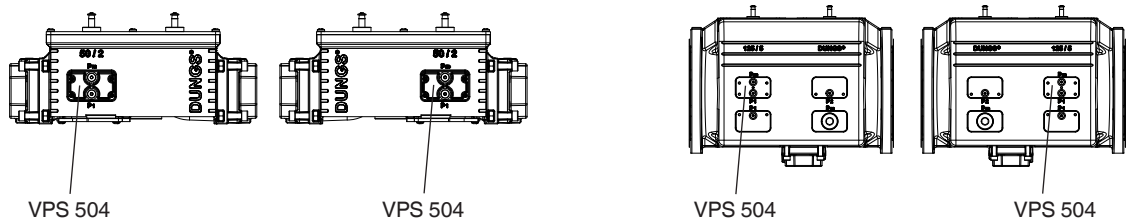


Location for DMV 5xxx Flanged Series

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



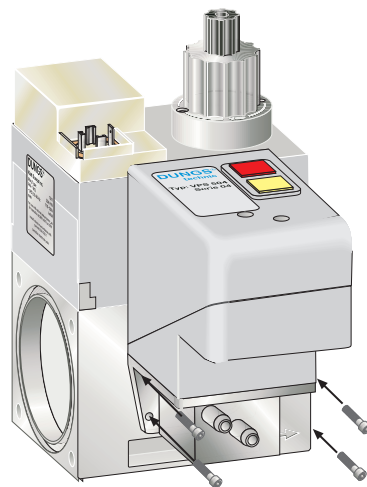
Location for MBE-... Series



Mounting VPS 504 to DMV Shutoff Valve

Recommended Mounting Procedure

1. Shut off the gas supply and disconnect all power to the DMV and the VPS 504 to prevent shock and equipment damage.
2. Verify the 10.5 x 2.25 mm O-rings are fitted into the grooves on the back of the VPS 504.
3. Verify that the O-rings are clean and in good condition.
4. Remove the G 1/8 plugs from port 1 and port 2 of the valve with a 3 mm hex key wrench.
5. Verify that the surface is clean and in good condition. Clean if necessary.
6. 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.
7. 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

Wiring Procedure

1. Use 14 or 16 gauge wire rated for 95°C (200°F).
 2. Disconnect all power to the VPS 504 before beginning the wiring to prevent electrical shock and equipment damage.
 3. Remove the black cap on top of the VPS 504.
 4. Loosen the screw which secures the gray cover and remove.
 5. Attach 1/2" NPT conduit to the black conduit adapter.
 6. Route the wires through the conduit connector.
 7. Install a conduit plug at some point in the conduit run between the VPS and closest panel that contains switching contacts or other sparking devices (see NFPA 86 requirements about potential risks of gas leaking down conduit).
 8. Connect the wiring to the appropriate screw terminals on the terminal strip.
 9. Replace the gray cover, the screw, and the black cap.
 10. A typical wiring diagram for operating the VPS 504 on burner start-up only is shown below.
 11. Recommended Torque
 - PG 13,5 connections: For both parts = 5 Nm
- NOTE:** This value is recommended for achieving the correct degree of protection and tensile strength. The tightening torque depends on the type of insulation of the cable used; it is always the responsibility of the user to determine the ideal torque for the application (e.g. degree of protection needed).
- VPS cover screw = 0.7 Nm
 - Terminal screws for wiring = 0.5 Nm



Do not wire the VPS RUN terminal to directly power the safety shutoff valves. The safety shut-off valves should always be under direct command to the flame safeguard.



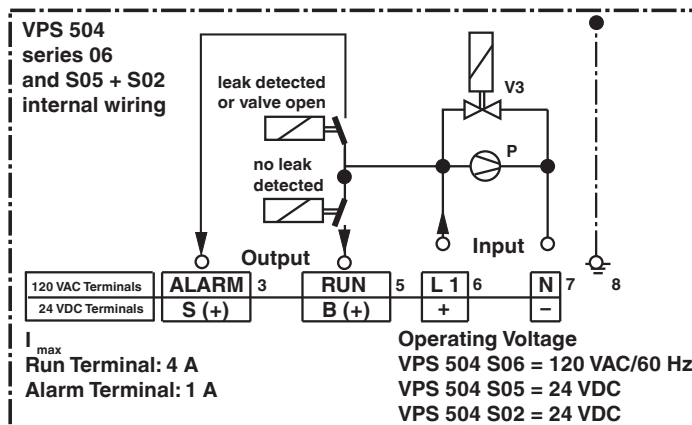
Frequency converters or frequency drive motors with insufficient shielding can cause faults in the VPS 504 as the result of transients. Verify that the equipment is provided with sufficient shielding.



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

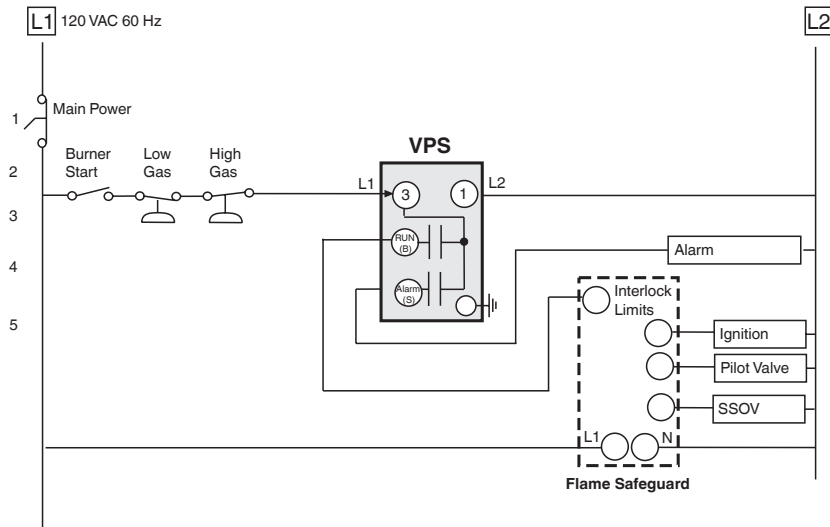


All wiring must comply with local electrical codes, ordinances and regulations.



Wiring VPS as proof of closure

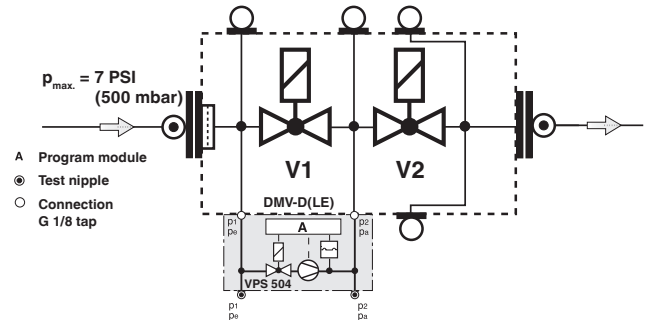
VPS wired as proof of closure to prove safety shutoff valves on a startup



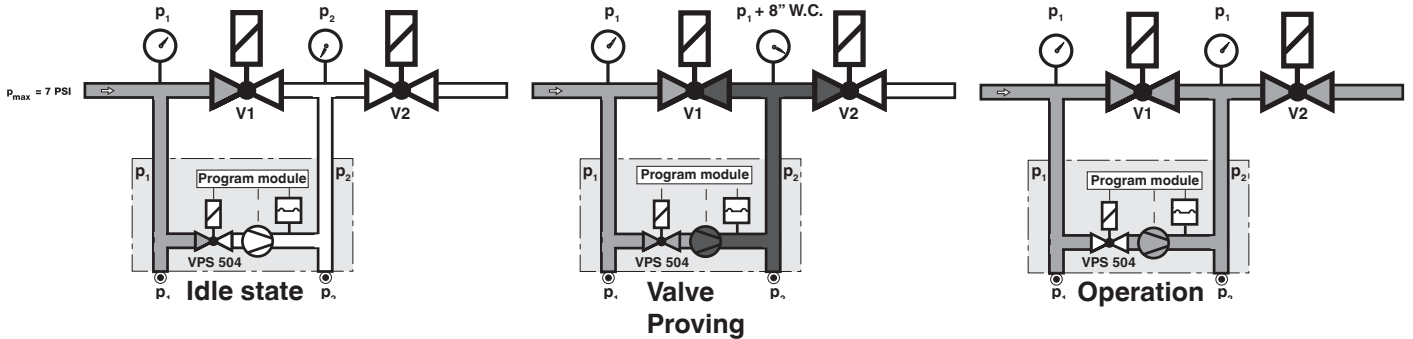
Operation

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 should be wired to prove on each start-up.



Program sequence



Idle state: Valves 1 and 2 are closed.

Valve proving: The internal pump pumps gas pressure from upstream of the first safety valve, p_1 , to the volume between the two safety valves. The gas pressure 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 36 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 36 s, and the red signal lamp lights continuously. (For 24VDC models, the S terminal is energized)

ALARM

1. Switch off appliance
2. Test Valve V1 and/or Valve V2 for tightness manually.
3. If untight replace Valve V1 and/or Valve V2.

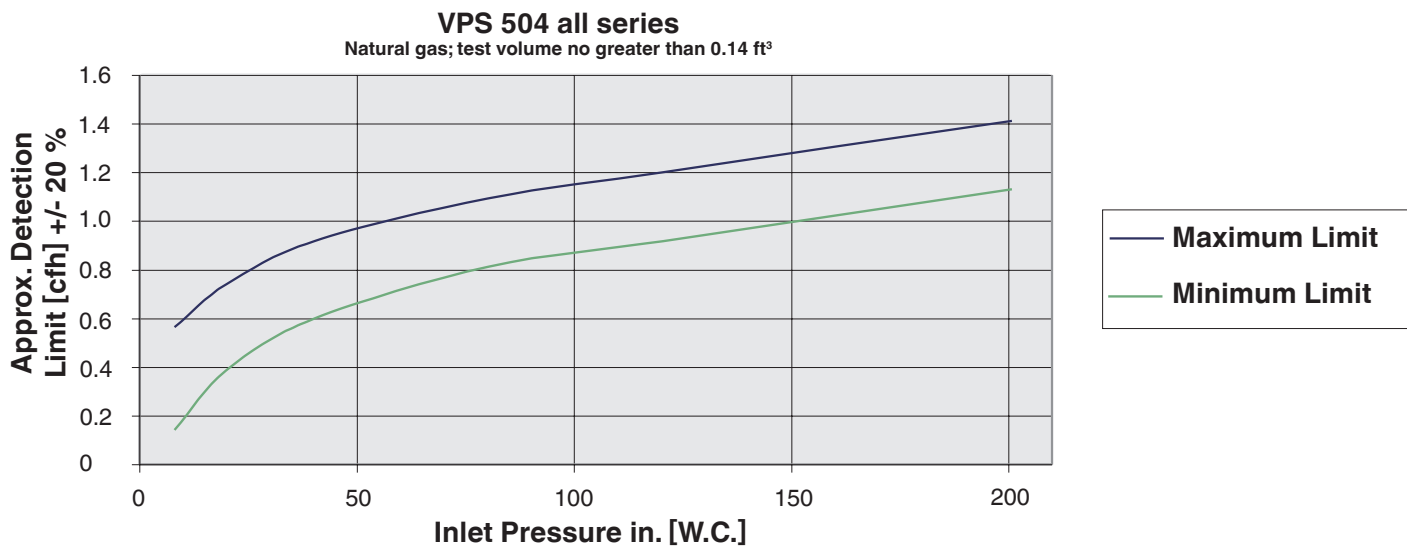
The release time (10 - 20 s) depends on the test volume (max. 0.14 ft³) and input pressure (max. 200 in. W.C.)

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 & Testing

⚠ Verify that both safety shutoff valves are deenergized and closed prior testing the VPS 504.

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

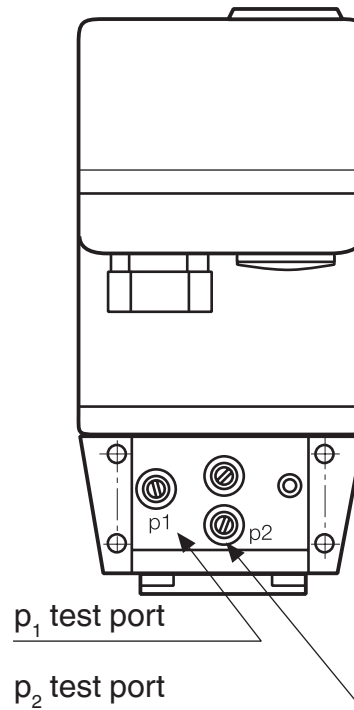
⚠ All test ports must be properly tightened before any gas is reapplied to the system.

⚠ 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 p_2 . Confirm that gas is not continuously leaking from p_2 by applying soapy water to the p_2 test port. If bubbles continue, perform a leakage test on the valve seats.
2. Close test nipple p_2 , 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.

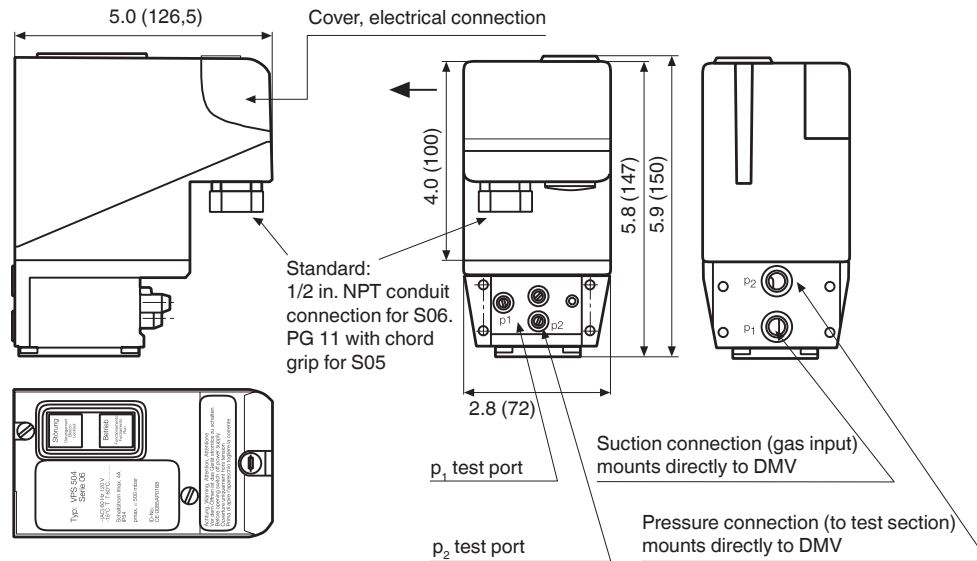
⚠ When the internal pump in the VPS 504 is running, a small amount of gas will flow from port #2 of the DMV.



Accessories & Replacement

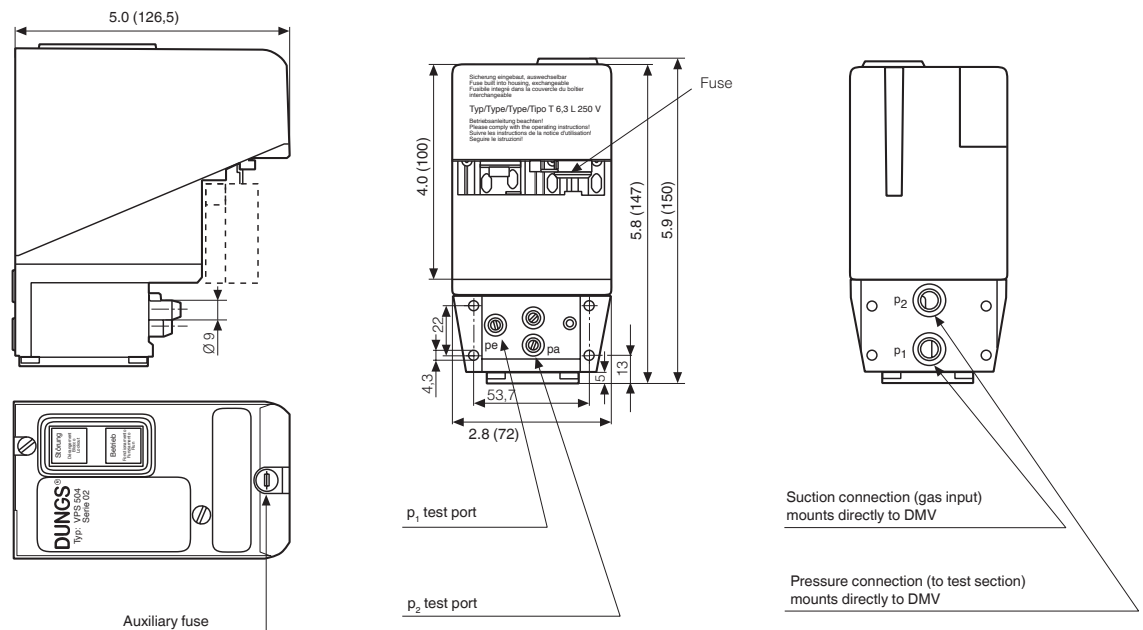
VPS 504 S05, S06

Inch (mm)



VPS 504 S02

Inch (mm)



Version

VPS 504 S06 (120 VAC 60 Hz)

VPS 504 S05 (24 VDC)

VPS 504 S02 (24 VDC)

Order No.

221073

224983

225481

Accessory

Mounting kit NPT 1/2 (2 filters, 2 o-rings, 4 mounting screws)

Mounting kit (for mounting to MVD Valves up to 2")

PG11 - 1/2" NPT Conduit adapter

Order No.

243801

205360

220566

We reserve the right to make modifications in the course of technical development.

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