CPI 400
Valve Switch and Position Indicator
Installation Instructions

USA CDN

DUNGS®
Combustion Controls

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Approvals

Approval for this part is covered under the safety valve certification.

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.

[V] [A]
[Hz] [VA]

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.

Safety first
O.K.

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

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

IFGC CSA UL ANSI NFPA

This product is intended for installations covered by, but not limited to, the following codes and standards: NFPA 86, CSD-1, ANSI Z21.13, UL 795, NFPA 85 or CSA B149.3.

Explanation of symbols

1, 2, 3 ... = Action
• = Instruction

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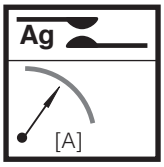
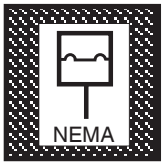
Specification

CPI 400 Closed position indicator CPI 400 visually and eletrically indicates when the valve is either in the closed or open position. Mounts directly to the DMV, SV and MVD series valves. When the valve is closed a orange light is visible, when the valve is open a green light is visible.

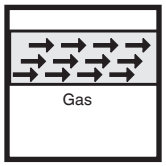




Switch Type
SPDT
Switch Action
Valve open: Green light
Valve closed: Orange light

Contact Rating
10 A res, 8 FLA, 48 LRA @ 120 VAC.
5 A res @ 230 VAC.
1 A max @ 24 VDC and 1 A max @ VDC. When used, the 24 VDC/VAC indicator light consumes 20 mA when energized

Enclosure
NEMA Type 4



Gases
Dry, natural gas, propane, butane; other noncorrosive gases. Suitable for up to 0.1 % by volume, dry H_2S when used with nickel plated brass adapter. A "dry" gas has a dew point lower than +15 °F and its relative humidity is less than 60 %.

Models Designations & Ranges

Type	Description	Order No.
CPI 400	Valve Switch	224-253

Mounting

1. The valve must be de-energized and the gas supply shutoff before mounting the CPI.
2. Disconnect all power to the switch before beginning to prevent electrical shock and equipment damage.
   Mounting Procedure (reference Fig. 1)

3. **IMPORTANT: Before mounting the brass adapter to the valve or to the CPI 400, use your fingers to verify that the pin slides freely inside the brass adapter. If this pin does not slide freely, apply a large enough force to the appropriate side to free the pin.**
4. Using a 5mm hex wrench, remove the plug and its o-ring located at the bottom of the valve.
5. Verify that the brass adapter has a clean o-ring and its threads and the groove into which the brass adapter mounts, are clean and in good condition.
6. Mount the brass adapter into the valve.
7. Use a 9/16" (14 mm) open end wrench and torque to 44 in-lbs (5Nm), which is about 1/4 turn (after finger tight). DO NOT overtighten.
8. Mount the CPI switch onto the brass adapter. Push the CPI housing towards the valve until it stops.
9. Turn/Position the CPI so that the wiring and conduit connection apply the least amount of torque as possible.

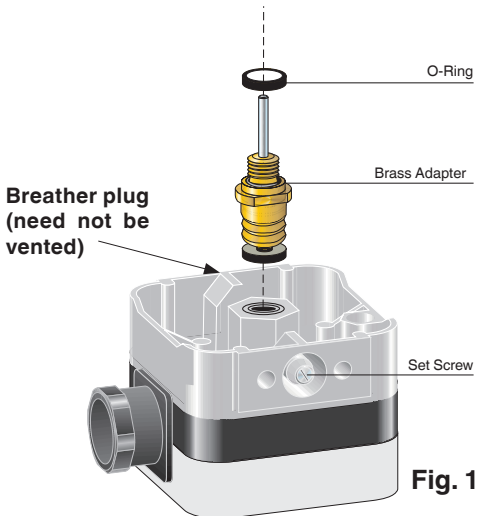


Fig. 1

10. Tighten the set screw so that the CPI housing is secured to the brass adapter.
11. Do not turn the CPI 400 after tightening the set screw; this may strip the brass adapter. The brass adapter could loosen and the assembly may leak.
12. Perform a leak test to verify that no leakage occurs around the o-ring.

Wiring

Required Wiring

- Do not exceed the switches electrical ratings.
- Use 14 or 16 gauge wire for at least 75 ˚C (167 ˚F).
- For NEMA 4 applications, NEMA 4 conduit or wiring methods must be used.
- Run one wire (the COMMON) to the L1 terminal, one to the GROUND terminal, one from the terminal 2 "Proof Terminal" to the Proof of Closure terminal of the Flame Safeguard, and one (the NEUTRAL) to L2 on the CPI 400.
  NOTE: If equipment neutral is not wired to L2 on the CPI 400, the lights will not properly indicate the valve position. The ORANGE light should be on when the valve is closed, The GREEN light should be on when the valve is open (FM and NFPA 86 requirement).

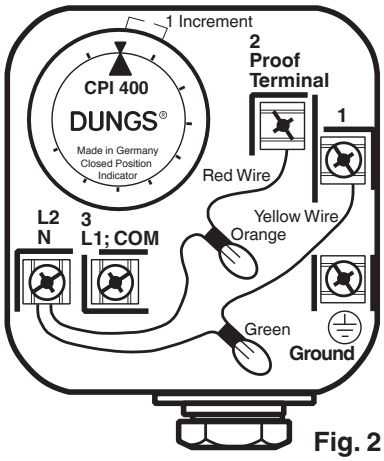
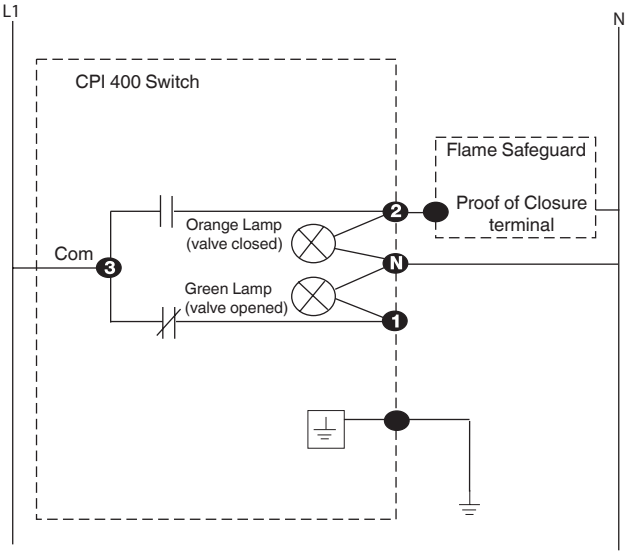


Fig. 2



⚠ Do not wire this switch to close a circuit that will directly power another safety shutoff valve. Doing so could result in a safety valve being energized and opened rather than emaining closed.

Calibration & Testing

The CPI 400 must be calibrated to the specific valve it is used on. Failing to properly calibrate this switch may lead to nuisance problems or to an unsafe startup condition.

Calibrating the CPI: (Reference Fig. 2)

1. The CPI must be properly mounted to the valve, and the valve must be closed.
2. Disconnect all power to the CPI 400 before adjusting to prevent electrical shock and equipment damage.
3. Remove clear cover.
4. Turn the adjustment dial counterclockwise until it stops.
5. Then turn the adjustment dial clockwise until the switch makes. If there is too much noise to hear the switch trip, proceed to **Calibrating the CPI in noisy environments.**
6. Note the position of the set point in reference to the white lines on the scale.
7. Turn the adjustment dial **two additional** increments clockwise to the same relative position.
8. Replace clear cover, the CPI is now adjusted.

Calibrating the CPI in noisy environments

1. Verify that there are no stray wires that are potentially a shock hazard while the dial is being manually adjusted.
2. Apply 120Vac to terminals L1 and L2 of the CPI.
3. Turn the adjustment dial counterclockwise until it stops. The GREEN light should be illuminated.
4. Then turn the adjustment dial clockwise until the RED light illuminates.
5. Note the position of the set point in reference to the white lines on the scale.
6. Turn the adjustment dial **two additional** increments clockwise to the same relative position.
7. Replace clear cover, and the CPI is now ready for serivce.

Annual Testing

1. Perform a switch continuity test at least annually to verify that with the valves de-engerzied, the continuity between the switch contacts T3 (COM) and T2 (Proof Terminal) does not exceed 0.2 ohms, and verify that there is no continuity between the switch contacts T3 (COM) and T1.
2. Then, energize the valve, and verify that the continuity between the switch contacts T3 (COM) and T1 does not exceed 0.2 ohms, and then verify that there is no continuity between the switch contacts T3 (COM) and T2.
3. If any above check fails, do not use the CPI and contact DUNGS immediately.

Replacement Parts	
Kit Clear plastic cover (1 pcs)	240-837
Kit 120 VAC neon lights (one orange & one green) (1 pcs)	231-420
Kit 24 VAC/VDC neon lights (one red & one green) (1 pcs)	248-183
PG 11 - 1/2" NPT conduit adapter (10 pcs)	231-214
PG 11 - 1/2" NPT conduit adapter (1 pcs)	220-566
Brass adapter (standard)	224-417
Brass adapter (Ni plated)	224-417B
CPI 400 valve switch	224-253A

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

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Replacement safety relevant components
Austausch sicherheitsrelevanter Komponenten

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It is necessary to replace safety-relevant components after they have reached the end of their useful life.

DUNGS recommends replacing such components according to the following table:

Es besteht die Notwendigkeit sicherheitsrelevante Komponenten nach Erreichen ihrer Nutzungsdauer auszutauschen.

DUNGS empfiehlt den Austausch gemäss folgender Tabelle:

Valid only for domestic, residential and industrial* heating applications.

***Not valid for high performance industrial heat process applications. See page 2**

Gültig nur für häusliche Heizungsanlagen

Nicht gültig für Thermprozessanwendungen mit Taktbetrieb

Valve Type Safety relevant component Ventil Typ Sicherheits-relevante Komponente	Recommended replacement after years/cycles: ➔ Depends on the value which will be achieved first Empfohlener Austausch nach Jahren/Schaltspielen: ➔ Je nachdem welcher Wert zuerst erreicht wird		Max. Cycle Rate Max. Schalthäufigkeit
	USEFUL LIFE [Years] DUNGS recommends replacement after: NUTZUNGSDAUER [Jahre] DUNGS empfiehlt den Austausch nach:	USEFUL LIFE [Rated Cycle Life (cycles)] DUNGS recommends replacement after: NUTZUNGSDAUER [Schaltspiele (auf/zu)] DUNGS empfiehlt den Austausch nach:	
DMV-(D)	10 Years 10 Jahre	1,000,000 cycles	500 /h
SV-(D)			
MV(D)/602			
DMV/MV/SV: LE-Ausführungen (mit Hydraulikbremse) DMV/MV/SV: LE-Versions (with hydraulic brake)		500,000 cycles	20 /h
Gasventil *mit* DUNGS-Ventilprüfsystem Gas valve *with* DUNGS valve proving system	Austausch nach erkanntem Fehler Replacement after error detection		
VPS 504*	10 Years 10 Jahre	250,000 cycles	20 /h
VDK 200*			15 /h
CPI 400		1,000,000 cycles @ 1 A and 120 VAC 100,000 cycles @ 10 A and 120 VAC	1,000 /h
CPI 401			

* Valve proving system values shown are expected lifetime. NFPA 86 does not require replacing if the expected life has been exceeded.

Änderungen, die dem technischen Fortschritt dienen, vorbehalten
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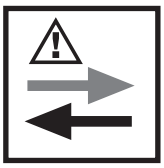

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Es besteht die Notwendigkeit sicherheitsrelevante Komponenten nach Erreichen ihrer Nutzungsdauer auszutauschen.

DUNGS empfiehlt den Austausch gemäss folgender Tabelle:

Valid for high performance industrial heat process applications!

Valve Type Safety relevant component Ventil Typ Sicherheitsrelevante Komponente	Recommended replacement after years/cycles: ➔ Depends on the value which will be achieved first Empfohlener Austausch nach Jahren/Schaltspielen: ➔ Je nachdem welcher Wert zuerst erreicht wird		Max. Cycle Rate Max. Schalthäufigkeit
	USEFUL LIFE [Years] DUNGS recommends replacement after: NUTZUNGSDAUER [Jahre] DUNGS empfiehlt den Austausch nach:	USEFUL LIFE [Rated Cycle Life (cycles)] DUNGS recommends replacement after: NUTZUNGSDAUER [Schaltspiele (auf/zu)] DUNGS empfiehlt den Austausch nach:	
MV ... /602 **NPT ½ - NPT 2** (**no** main flow adjustment)	3 Years 3 Jahre	3,000,000 cycles	1,000 /h
MVD ... /602 **NPT ½ - NPT 1** (**with** main flow adjustment)			
MVD ... /602 **NPT 1¼ - NPT 3** (**with** main flow adjustment)		1,000,000 cycles	
Conditions	**Clean gas (NG, LNG, LPG): maximum 50 micron gas filter required!** **Dry Gas:** ■ **relative humidity** < 60 % ■ **dew point of the gas** < –14 °F		} "dry"

➔ **Not valid for MV(D).../602 valves delivered before 2011/01**

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