



Actuators

SKP2...

-
- **ON / OFF safety shutoff feature conforming to EN 161 in connection with gas valves from Siemens**
 - **With setpoint adjuster**
 - **Delayed opening**
 - **Rapid closing**
 - **Very low power consumption**
 - **For gases of gas families I...III**
 - **With or without end switch**
 - **Supplementary Data Sheets (refer to the relevant Data Sheets on gas valves)**

The SKP2... and this Data Sheet are intended for use by OEMs which integrate the actuators in their products.

The SKP2... are suited for use with the following types of gas valves:

Type of valve	Medium	Data Sheet
VGG... VGF... VGH...	Natural gas Gases of gas families I...III	N7636
VGD20... VGD40...	Natural gas Gases of gas families I...III	N7631
VRF... VRH...	Biogas	N7633
VLf...	Hot air	N7637

The combination of pressure governor and gas valve provides the following functions:

- Safety shutoff valve
- Safety shutoff valve with gas pressure governor

The actuator is supplied with integrated precision pressure governor.

The electrohydraulic SKP2... / VG... gas valves are designed primarily for use on gas-fired combustion plants. The actuator can be combined with any of the above mentioned gas valves and valve sizes. The versions with gas pressure governor do not only shorten the gas train, they also permit smaller valve sizes than those normally used in conventional gas trains. The actuator can be supplied complete with end switch for indicating the fully closed position, for example. For information about valve sizing, refer to «Valve sizing chart » in the Data Sheet of the relevant gas valve.

SKP20.130...

The SKP20.130... operates as a zero governor and controls the gas pressure depending on the combustion air pressure, thereby ensuring that the gas / air ratio remains constant across the entire load range (setpoint is shifted according to the static pressure of the combustion air). In contrast to conventional fuel / air ratio control, gas / air volume variations caused by mains pressure fluctuations or dirty gas / air filters have therefore no impact on the quality of the combustion process.

Warning notes



To avoid injury to persons, damage to property or the environment, the following warning notes should be observed!

Only qualified staff may open the actuator, interfere with it, or make changes in the respective connection area!

- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- Before opening the connection area of the SKP2..., completely isolate the actuator from the mains supply
- Ensure protection against electric shock hazard by fitting the SKP2... and by making the electrical connections
- Each time work has been carried out (mounting, installation, service work, etc.), check to ensure that wiring is in an orderly state
- Check to ensure that the impulse pipes are correctly connected and tight
- Fall or shock can adversely affect the safety functions. Such devices must not be put into operation, even if they do not exhibit any damage

Engineering notes

Design of gas train

If the available gas pressure exceeds the valve's maximum permissible operating pressure (refer to the Data Sheet on the respective gas valve), the gas pressure must be lowered by an upstream pressure controller. Apart from that, no additional pressure controller is required. The pressure switch for lack of gas must always be fitted upstream of the gas valve when used in connection with the SKP2... The inner diameter of the impulse pipe must be a minimum of 6 mm.

Mounting notes

- Ensure that the national safety regulations are complied with
- Assemble actuator and gas valve using the 4 screws contained in the terminal compartment
- The quadrate arrangement of the fixing holes enables the actuator to be fitted in 4 different 90° positions
- The actuator can be mounted or replaced while the gas train is under pressure; sealing material is not required
- Follow the Mounting Instructions M7641.3 included with the actuator

Installation notes

- When using the end switch, the earth conductor of the connecting cable must be connected to the earth terminal on the housing

Commissioning notes

- Electrical commissioning may only be performed when the SKP2... is fitted to the valve; otherwise, the actuator can be damaged

Standards and certificates



ISO 9001: 2000
Cert. 00739



ISO 14001: 1996
Cert. 38233

Type reference			
SKP20.110B17	x	x	x
SKP20.110B27	x	x	x
SKP20.111B17	x	x	x
SKP20.111B27	x	x	x
SKP20.130B27	x	x	---
SKP20.211A17	x	x	---
SKP20.211A27	x	x	---

For use in the U.S. / Canada, the actuators carry type suffix «U» (see example) and are UL-, CSA- and FM-listed.

Example: SKP20.110U17

In connection with
VG... valve



Conformity to EEC directives
- Electromagnetic compatibility EMC (immunity)
- Directive for gas appliances
- Directive for pressure devices

89 / 336 EEC
90 / 396 EEC
93 / 23 EEC

Disposal notes



The actuator contains electrical components, electronic components and hydraulic oil and must not be disposed of together with domestic waste. Local and currently valid legislation must be observed.

Mechanical design

SKP20... The setpoint adjustment facility can be sealed. The housings of actuator and gas pressure governor are made of die-cast aluminium. The seals are made of Elastomere.

Type summary (other types of actuators on request)

SKP20... Electrical connections are made via the terminal compartment

Mains voltage	AC 100...110 V	AC 220...240 V
1-stage opening and closing, without end switch		
- With pressure governor up to 22 mbar	SKP20.110B17	SKP20.110B27
- With zero governor	Not in the range	SKP20.130B27
1-stage opening and closing, with end switch		
- With pressure governor up to 22 mbar	SKP20.111B17	SKP20.111B27
- With pressure governor up to 1500 mbar (on request)	SKP20.211A17	SKP20.211A27

Setpoint springs Supplied as standard for pressure range 0...22 mbar.

Springs for the following pressure ranges must be ordered separately.

- SKP20...
15...120 mbar AGA22 (yellow)
100...250 mbar AGA23 (red)
- SKP20.130...
±1.5 mbar AGA28 (unpainted)

Ordering

When ordering, please give type reference of actuator according to «Type summary».

Example:

Gas pressure governor with safety shutoff function **SKP20.111B27**
- With end switch
- For AC 230 V / 50 Hz

Accessories



Setpoint spring for SKP20...
- 15...120 mbar
- Yellow

AGA22



Setpoint spring for SKP20...
- 100...250 mbar
- Red

AGA23



Setpoint spring (unpainted) for SKP20.130...
- Optional to standard spring (0...22 mbar)
- ±1.5 mbar
- Wire dia. 0.6 mm

AGA28



Setpoint spring (unpainted) standard
- 0...22 mbar
- Wire dia. 1 mm

AGA29



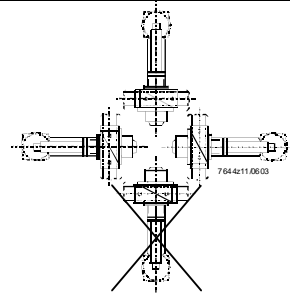
Damping throttle for SKP20...

AGA25

Technical data

General unit data

Mains voltage	AC 220 V -15 %...AC 240 V +10 % AC 100 V -15 %...AC 110 V +10 %
Mains frequency	50...60 Hz ± 6 %
Power consumption	max. 13.5...23 VA
End switch (if fitted)	
- Switching capacity	4 (2 A, $\cos\varphi = 0.3$)
- Setting range	4...96 % stroke
- On time	100 %
Opening time for full stroke	6...12 s (depending on nominal valve size)
Opening speed	approx. 2 mm/s
Closing time when switching off	< 0.8 s
Perm. mounting positions	



always with the diaphragms in the vertical position

Degree of protection	IP 54, with valve fitted
Cable entry	
- Pg11	2 knockout holes for Pg11 glands, nut max. 3 mm thick
- M16 (alternatively)	2 knockout holes for M16 glands, nut max. 3 mm thick
Stroke	max. 18 mm (max. stroke limited by valve)
Inlet pressure	max. 300...1200 mbar (depending on valve size, refer to Data Sheets on gas valves)
Outlet pressure setpoint range	0.5...250 mbar (4 setpoint springs, refer to «Accessories»)
Weight	
- Actuator	approx. 1250 g
- Actuator with pressure governor	approx. 1650 g
Suitable media	according to the type of valve used
Medium inlet pressure	according to the type of valve used
Perm. medium temperature	according to the type of valve used
Flow rate	according to the type of valve used

Gas pressure governor

Control class	A to DIN EN 88
Control mode	P
Setting range (setpoint)	max. 250 mbar (gas pressure)
Recommended distance of impulse pipe connection from valve	min. 5 x nominal size
Inner dia. of impulse pipe (gas pressure)	min. 6 mm
Inlet pressure	same as valve
Perm. test pressure «PG»	1 bar
Perm. underpressure «PG»	200 mbar
Required interval for load change from high-fire to low-fire	min. 5 s (depending on the valve's stroke)
Control group	III to DIN 3392

Technical data (cont'd)

Only for SKP20.130B27	Combustion air pressure	max. 50 mbar
	Zero governor	to EN 12067-1
	Compensating variable	differential pressure of combustion air ≥ 0.5 mbar
	Differential pressure ratio (gas / air)	1:1
	Parallel displacement	PGas ±1 mbar
Environmental conditions	Storage	DIN EN 60721-3-1
	Climatic conditions	class 1K3
	Mechanical conditions	class 1M2
	Temperature range	-10...+60 °C
	Humidity	< 95 % r.h.
	Transport	DIN EN 60 721-3-2
	Climatic conditions	class 2K2
	Mechanical conditions	class 2M2
	Temperature range	-10...+60 °C
	Humidity	< 95 % r.h.
	Operation	DIN EN 60 721-3-3
	Climatic conditions	class 3K3
	Mechanical conditions	class 3M3
	Temperature range	-10...+60 °C (longer opening time below 0 °C)
	Humidity	< 95 % r.h.

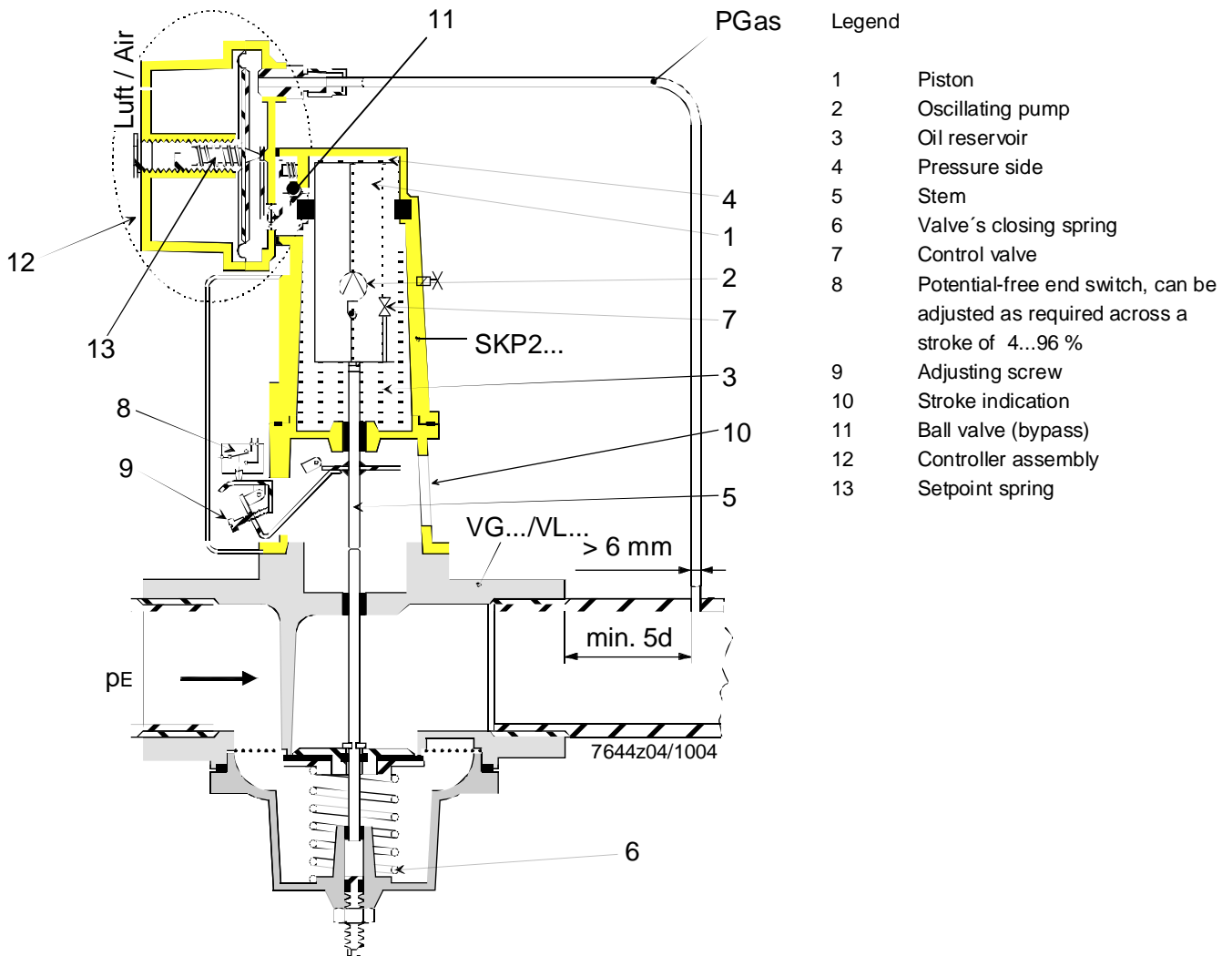


Condensation, formation of ice and ingress of water are not permitted!

Function

Basic design of
SKP20... / SKP2...
with valve

(Schematic drawing)

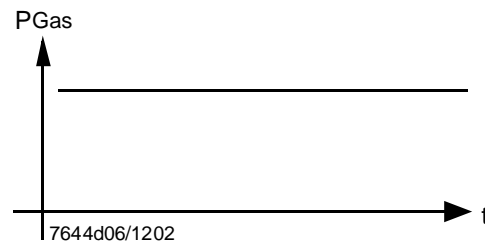


Functioning principle
with safety shutoff
feature

When power is supplied to the actuator, the pump will be switched on and the control valve closed. Then, the pump pumps oil from the nearly filled chamber beneath the piston to the actual pressure chamber above the piston. This causes the piston to move downward, thereby opening the valve against the pressure of the closing spring. The pump remains energized until the closing command is given. When power is removed, or in the event of a power failure, the pump will be deactivated and the control valve opened so that the closing spring pushes the piston back. The return valve is sized such that the counter-stroke required for reaching the fully closed position is completed within about 0.8 seconds.

Functioning principle of pressure governor

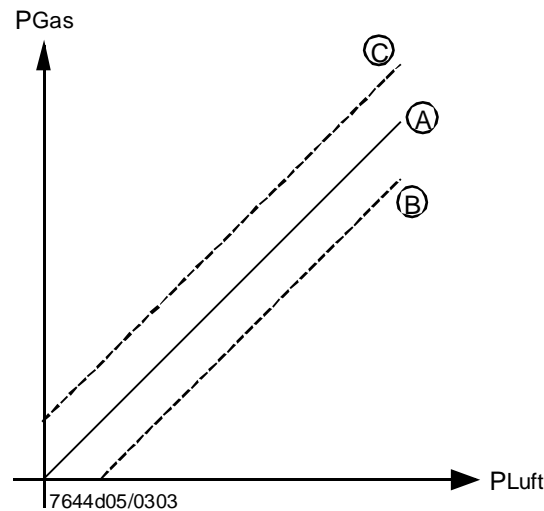
On the attached pressure governor, the outlet pressure (actual value) acts on a spring-supported diaphragm. The force of that counter-spring is adjustable and represents the setpoint. The diaphragm acts via a lever system on the ball valve in the bypass between the pump's suction and pressure side. If the actual value lies below the setpoint, the bypass is closed, enabling the actuator to open the valve. If the actual value exceeds the setpoint, the bypass will open to such an extent that the oil can return from the pressure chamber to the reservoir. The piston retracts and the valve moves towards the fully closed position. This counter-stroke ends as soon as the actual value agrees with the setpoint. In this position, the bypass is opened to such an extent that the amount of oil returning through the bypass equals the pump's output. Since small deflections of the diaphragm are sufficient to trigger the described control functions, control accuracy is very high. The control characteristic is that of a P-controller with a very narrow proportional band.



Functioning principle of zero governor SKP20.130...

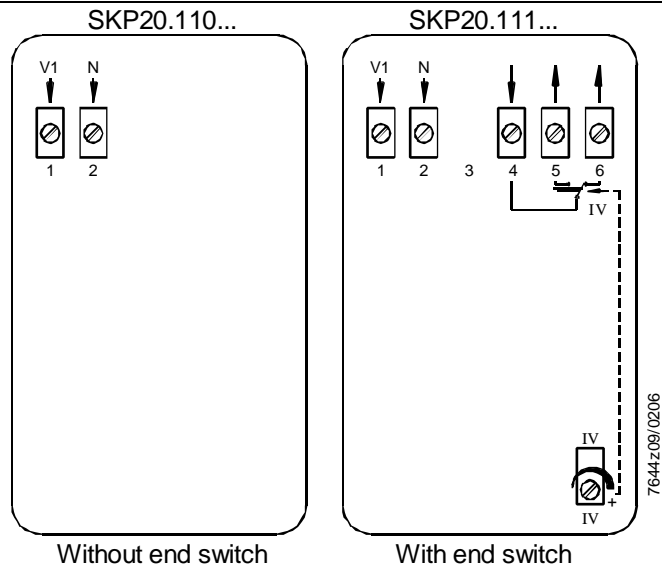
With the SKP20.130..., the fan pressure (air connection) acts on the diaphragm's setpoint side, in place of the setpoint spring.

Working characteristic of SKP20.130...



- Ⓐ Gas / air ratio for stoichiometric combustion
- Ⓑ At low-fire, the parallel displacement of the working characteristic produces a larger amount of excess air in percent. The zero governor permits a parallel displacement in both directions, towards «Excess air» Ⓑ and «Lack of air» Ⓒ

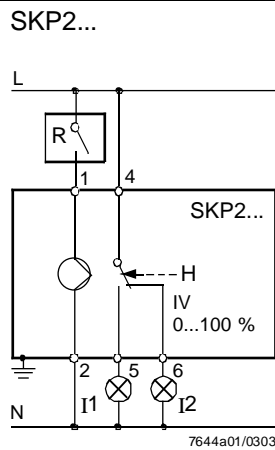
Terminal markings




Without end switch

With end switch

Connection diagram



Legend

-  Fuses, etc., must be in compliance with local safety regulations
- IV Potential-free end switch
(adjustable, only for actuators supplied with an end switch, refer to «Type summary»)
- H Stroke of spindle
- I1 / I2 External indication
- N Neutral conductor
- L Live
- R External switching element (controller, switch, etc.)

Dimensions

Dimensions in mm

SKP20...

