SIEMENS

SKPx5 Series

Technical Instructions
Document No. 7643
SKPx5.xxxUx
March 26, 2026

SKPx5.xxxUx Gas Valve Actuator with Safety Shutoff Function


SKP15.xxxUx


SKP25.xxxUx


SKP55.xxxUx


SKP75.xxxUx

ISO 9001 and 14000 REGISTERED FIRM

Only when assembled to series VGxxx.xxxU gas valves

General description

SKPx5.xxxUx electro-hydraulic actuators are used in combination with VGxxx.xxxU gas valve bodies to provide slow opening, fast closing safety shut-off and, depending on model gas pressure regulation and air/gas ratio control for industrial and commercial burner applications. Since safety shut-off, constant pressure regulation or air/gas ratio control can be performed by a single valve, fewer gas train components and fittings are required to assemble a gas train. This significantly reduces both the size and weight of the gas train. The total pressure drop across the gas train arrangement is reduced, allowing for the use of smaller diameter gas trains in most applications.

The compact SKPx5.xxxUx actuator opens slowly when powered and closes immediately upon power interruption. The modular design allows the SKPx5.xxxUx to be used in combination with all VGxxx.xxxU gas valves bodies from ½" to 6" sizes. The actuator can easily be mounted on the square flange of any VGxxx.xxxU valve with four pre-mounted screws. No gaskets or seals are required when mounting the actuator. A visible position indicator on the front of the actuator displays the entire stroke of the valve. A light indicates when the actuator is powered.

Application

All SKPx5.xxxUx electro-hydraulic actuators combine with VGxxx.xxxU gas valves to provide safety shut-off control for industrial and commercial burner applications.

VGxxx.xxxU or VRD40.xxxU gas valve bodies to be ordered separately.

Type of valve	Medium	Data Sheet
VGG10.xxxU	Natural gas, air	N7636us
VGD20.xxxU VGD4x.xxxU	Natural gas, air	N7631us
VRD40.xxxU	Biogases Recycling gases Air	N7649us

SKP25.xxxUx

The SKP25.xxxUx controls the burner manifold gas pressure according to a fixed setpoint. The SKP25.xxxUx can also be applied as a 1:1 air/gas proportionator or zero governor.

SKP55.xxxUx

The SKP55.xxxUx actuator controls the pressure difference across a restriction in the gas supply line as a function of the pressure difference across a restriction in the air supply duct, so that the air/gas ratio remains constant irrespective of air volume changes. There is no need for an upstream constant pressure regulator when using an SKP55.xxxUx actuator within the applicable pressure range of the VGxxx.xxxU valve body.

SKP75.xxxUx

The SKP75.xxxUx controls the burner manifold gas pressure as a function of the combustion air pressure. There is no need for an upstream constant pressure regulator when using an SKP75.xxxUx actuator within the acceptable pressure range of the VGxxx.xxxU valve body.

If the combustion air pressure exceeds the permissible value of 12" or 20" w.c. (see *Specifications*), the pressure must be reduced by means of a pressure reducing T-fitting AGA78.

Features

SKPx5.xxxUx

- UL listed, FM approved, CSA certified, IRI approval, and ISO 9001 certified. European, Australian and Japanese approved versions available.
- Proof of Closure with Over Travel (POC) option.
- Optional NEMA 4 protection.
- Visual position indication.
- "Power on" indication light.
- Quick connect wiring terminals.
- Optional adjustable auxiliary switch.
- Modular design with 360° actuator rotation for easy field wiring and installation.
- Low (10 VA typical), power consumption.

SKP25.xxxUx

- Safety shut-off function and pressure regulating function in one compact unit.
- Applicable as 1:1 air/gas proportionator or zero governor.
- Accurate pressure control characteristics, and zero offset (droop).
- Integral regulation leak limiter.
- Excellent tracking characteristic.
- Supports high burner turndown ratios such as 40 to 1 when correctly applied. Turndown is dependent on variables including gas inlet pressure and use of AGA25.2.
- Certified as a ventless pressure regulator when properly applied with a AGA25.x vent limiter. See accessories.

SKP55.xxxUx

- Safety shut-off function, pressure regulating function and air/gas ΔP control in one compact unit.
- Simplifies commissioning and reduces start-up time for:
  - o Recuperative burners with combustion air preheating.
  - o Burners with continuously variable air or gas nozzle openings in the burner head.
  - o Burners where either the air or gas pressure is not representative of the actual flow.
  - o Burners with negative combustion air pressure levels.
- Maintains air/gas ratio when the airflow is disrupted.
- Automatic compensation for combustion chamber back pressure fluctuations.

SKP75.xxxUx

- Safety shut-off function, pressure regulating function and air/gas ratio control in one device.
- Compensation for air temperature fluctuations.
- Automatic compensation for combustion chamber back pressure fluctuations.

Product Numbers

Table 1. SKPx5.xxxUx model numbers

Product Number	Operating Voltage	Proof of Closure Switch [3]	Auxiliary Switch [3]	Type of Switch
SKP15.011U1	120 Vac	●	---	SPDT
SKP15.012U1	120 Vac	●	●	SPDT SPDT
SKP15.012U2	230 Vac	●	●	SPDT SPDT
SKP15.013U1	120 Vac	---	---	---
SKP25.011U1	120 Vac	●	---	SPDT
SKP25.012U1	120 Vac	●	●	SPDT SPDT
SKP25.012U2	230 Vac	●	●	SPDT SPDT
SKP25.013U1	120 Vac	---	---	---
SKP25.411U1 [1]	120 Vac	●	---	SPDT
SKP25.611U1 [2]	120 Vac	●	---	SPDT
SKP55.011U1	120 Vac	●	---	SPDT
SKP55.012U1	120 Vac	●	●	SPDT SPDT
SKP55.013U1	120 Vac	---	---	---
SKP75.011U1	120 Vac	●	---	SPDT
SKP75.012U1	120 Vac	●	●	SPDT SPDT
SKP75.013U1	120 Vac	---	---	---

NOTE:
1. High outlet pressure model for 1.5 to 20 psi outlet pressure regulation.
2. High bias model for proportionator function with 0" to – 4" w.c. bias.
3. Proof of closure and auxiliary switches cannot be field installed.

Accessories

	AGA22	Yellow setpoint spring for 6” to 48” w.c. (1.5 to 10 psi for SKP25.411U1)
	AGA23	Red setpoint spring for 40” to 100” w.c. (8.5 to 20 psi for SKP25.411U1)
	AGA25.2	Vent limiter for mounting into vent connection of SKP25.0xxUx or SKP25.4xxUx models for applications with natural gas up to 5 psi, or with propane or butane up to 1.5 psi
	AGA25.3	Vent limiter for mounting into vent connection of SKP25.0xxUx or SKP25.4xxUx models for applications with natural gas 5…20 psi, or with propane or butane between 1.5…10 psi
	AGA28	Black bias spring to install if SKP25.0xxUx for -0.4" to 0.4" w.c. is used as proportionator or zero governor
	AGA29	Unpainted setpoint spring for 0" to 8.5" w.c. (included in SKP25.0xxUx as standard)

AGA66



Sealing gasket to provide NEMA 3, NEMA 3R, and NEMA 4 protection.
Gasket kit to mount SKPxx.xxxUx

- Placed between actuator SKPxx.xxxUx and valve VGxxx.xxxU or valve VRD40.xxxU
- Increases degree of protection from IP54 to IP65
- Refer to Mounting Instruction M7643.2 (74 319 0421 0)

AGA75.U1/4NPT



Damping throttle for SKP55.xxxUx / SKP75.xxxUx, US thread ¼“ NPT

- Optional, pipe connection for ∅6 mm
- Refer to Mounting Instructions 4 319 2078 0

AGA78



Air pressure reducing T-fitting

AGA30.7



Adaptation to SKP25.xxxUx
For motorized pressure correction
Siemens part number: S55851-Z401-A100
See Mounting Instructions A5W00000658.

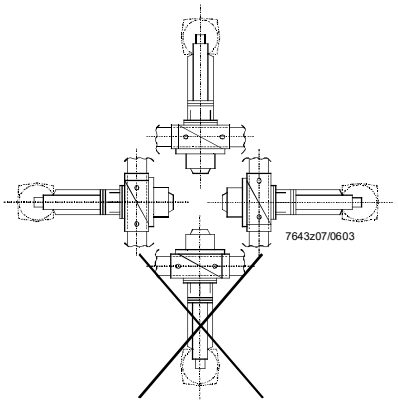
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Motorized setpoint adjuster for SKP25.0xxUx

- For 5.5 mm stroke
- See Data Sheet N4581 and Mounting Instructions A5W00000658 (M7643)

Specifications

Agency approvals	As safety shut-off valve	UL/429, FM/7400, ANSI Z21.21/CSA6.5 C/I Agency marks apply only for SKPx5.xxxUx actuators with VGxxx.xxxU series gas valve bodies.
SKP25.xxxUx, SKP55.xxxUx and SKP75.xxxUx	As a pressure regulator	ANSI Z21.18/CSA 6.3 The maximum inlet pressure for the pressure regulator is dependent on the valve model
Power supply	Operating voltage	120 Vac + 10% to -15% 230 Vac + 10% to -15%
	Operating frequency	50 to 60 Hz + 6%
	Power consumption	10 VA
	Duty cycle	Continuous (100%)
Operating environment	Ambient operating temperature	14°F to 140°F (–10 °C to 60 °C)
	Permissible mounting positions	 Always with the diaphragms in a vertical position
	Maximum inlet gas pressure	Same as VGxxx.xxxU series
	Maximum temperature of air and flue gas at the control connections	140°F (60 °C)

Specifications Continued

Physical characteristics	Weight	
	SKP15.xxxUx	2.4 lb (1.1 kg)
	SKP25.xxxUx	3.5 lb (1.6 kg)
	SKP55.xxxUx	4.2 lb (1.9 kg)
	SKP75.xxxUx	5.1 lb (2.3 kg)
	Enclosure	NEMA 1, 2, 5, and 12 NEMA 3, 3R, and 4 with optional AGA66 sealing gasket (mounted with VGG10.xxxU / VGDxx.xxxU / VRD40.xxxU valves)
	Dimensions	See Figures 13...17
	Specification for valve bodies	See gas valve *Technical Instructions*, for *VGG10.xxxxU* N7636us, for *VGDxx.xxxU* N7631us, for *VRD40.xxxU* N7649us
Connections	Conduit connection	Two 1/2-inch NPSM threaded knock-outs
	Electrical connection	Spring-loaded terminals for 14 AWG wires
	Gas connection	1/4" NPT (see *Installation notes*)
	Air connection	1/4" Rp (see *Installation notes*)
	Gas pressure test connection	Hose barb with close-off screw
SKP75.xxxUx	Combustion chamber pressure test connection	Hose barb with close-off screw
Operating characteristics	Opening speed, typical (approx. 2 mm/s)	The opening time for full stroke varies with valve size
	Closing time	<0.8 seconds slower opening speed at lower temperature

Specifications Continued

Operation / installation	Outlet pressure spring range	0" to 8.5" w.c. (standard, unpainted spring, AGA29)
SKP25.xxxUx	for SKP25.0xxUx models	6" to 48" w.c. (yellow spring, AGA22) 40" to 100" w.c. (red spring, AGA23)
	for SKP25.411U1 models	1.5 to 10 psi (standard, yellow spring, AGA22) 8.5 to 20 psi (red spring, AGA23)
	With air pressure loading in SKP25.0xxUx models	± 0.4" w.c. bias (black spring AGA28)
	With zero governor in SKP25.611U1	0.4" to – 4" w.c. bias
	Maximum sensing line pressure / leakage test pressure	20 psi
	Maximum sensing line vacuum	3 psi
	Minimum sensing line diameter	1/4" inside diameter
	Minimum distance between sensing line and gas valve outlet	5 times the pipe diameter (could be less if proven with application)
	Minimum time required for high to low fire load changes	4 seconds (depending on valve stroke)
SKP55.xxxUx	Differential pressure ratio	1:1
	Permissible pressure differences during operation for accurate control	Gas: minimum 0.1" w.c. Gas: maximum 80" w.c. Air: minimum 0.1" w.c. Air: maximum 80" w.c.
	Low fire bias range	-0.4 to 0.4" w.c.
	Minimum distance of impulse pipe connections	3 pipe diameters before and 5 pipe diameters after any valve, damper, elbow, coupling, or flow disruption
SKP75.xxxUx	Setting range of gas to air pressure ratio	Pg / Pa from 0.4:1 to 9:1
	Permissible pressures:	
	Min. air pressure for accurate control	0.2" w.c. (Pa-Pc)
	Max. air pressure: with setting Pg/Pa <2	20" w.c. (Pa-Pc)
	Max. air pressure: with setting Pg/Pa >2	12" w.c. (Pa-Pc) (with higher air pressures use AGA78)
	Min. downstream gas pressure for accurate control	0.4" w.c. (Pa-Pc or Pg-Pa)
	Max. downstream gas pressure	40" w.c. at any Pg/Pa setting during operation
	Minimum distance between gas sensing line and gas valve outlet (SKP75.xxxUx)	5 times the pipe diameter

☞ **NOTE:**
When the combustion chamber pressure Pc is connected, the above pressures should be considered pressure differentials Pg-Pc and Pa-Pc.

Specifications Continued

Auxiliary features

Proof of closure switch	Non-adjustable
Setting range of auxiliary switch	40% to 100% of stroke
Switch rating	4 A (2 A, cosφ = 0.3)

NOTE:
AUX-circuit not for SELV (safety extra low voltage)!

Operation
(see Figure 1)

Safety shut-off function

The electro-hydraulic actuator consists of a cylinder filled with oil, a piston containing an electric oscillating pump, and a relief system. When power is supplied to the actuator, the relief system closes, and the pump moves oil from the reservoir into the pressure chamber. This action causes the piston to move downward in the cylinder, opening the gas valve. When power to the actuator is interrupted, the relief system opens and the gas valve closes in less than 0.8 seconds.

A position indicator, visible through the transparent window of the terminal box cover, shows the entire possible stroke range of the actuator. A light, which is visible through the lower left transparent window of the terminal box cover, indicates when the actuator receives power. An optional, non-adjustable SPDT proof of closure over travel switch signals the closed position after the gas valve has closed. An optional SPDT auxiliary switch is adjustable between 40% and 100% of the stroke. The adjustment screw and scale are located on the right side in the terminal box, and are visible through the transparent window of the terminal box cover.

The sealing gasket, AGA66, can be installed between the actuator and the gas valve to provide NEMA 3, 3R, and 4 protection rating for VGG10.xxxU / VGDxx.xxxU / VRD40.xxxU valves.

Operation continued

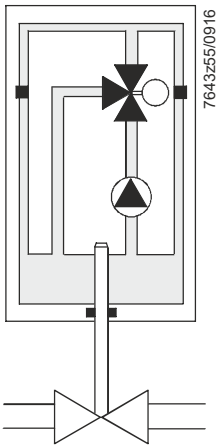


Figure 1. SKP15.xxxUx operation

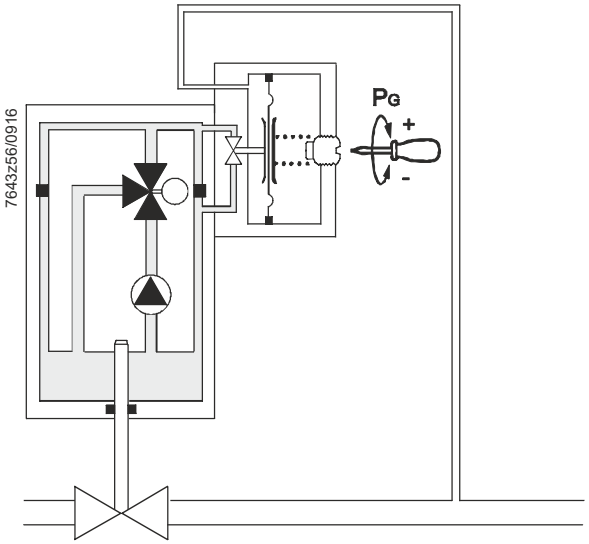


Figure 2. SKP25.xxxUx operation

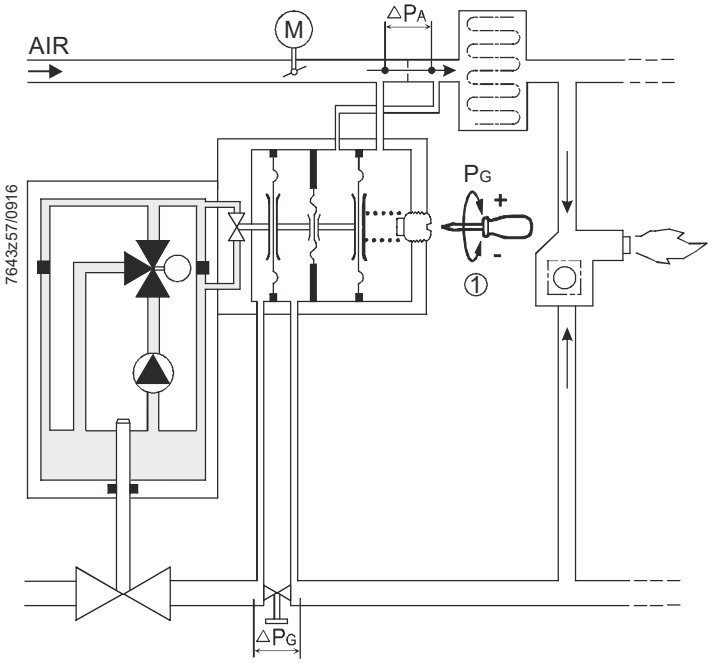


Figure 3. SKP55.xxxUx operation

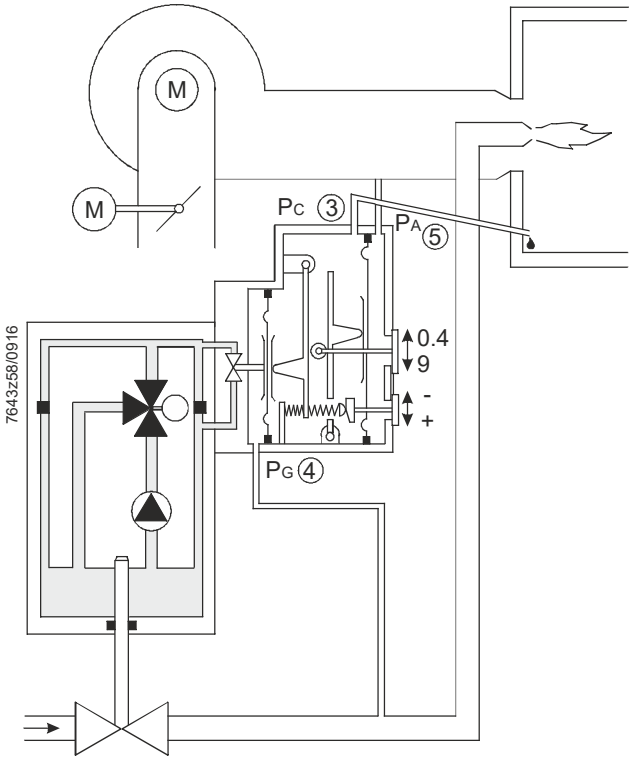


Figure 4. SKP75.xxxUx operation

Operation continued

(see Figure 2)

Regulating function

SKP25.xxxUx

The outlet gas pressure sensing line is connected to the pressure regulator housing. The outlet pressure acts on the regulator diaphragm. The diaphragm is opposed by an adjustable setpoint spring force, which represents the desired gas pressure value. The movement of the diaphragm modulates a hydraulic bypass valve connecting the pressure chamber to the hydraulic fluid reservoir. When the outlet gas pressure is lower than the desired value, the bypass valve is closed by the movement of the diaphragm, causing the actuator piston to open the gas valve.
The opposite occurs when the outlet gas pressure is higher than the desired value; the diaphragm moves to open the bypass causing the actuator piston to close the gas valve. The movement of the actuator piston stops once the outlet gas pressure is equal to the setpoint. In this position the bypass valve is partially open so that the oil flow supplied by the pump is identical to the return flow.
Unlike the conventional direct acting regulators, the SKP25.xxxUx servo operated regulating system displays virtually zero droop (offset) across the turndown range.

The SKP25.0xxUx models may be applied as a 1:1 air/gas proportionator or as a zero governor. For either application, the standard spring has to be replaced with AGA28 spring, which allows adjusting the bias between +0.4" to -0.4" w.c. For proportionator operation, the air pressure sensing line must be connected to the port marked “AIR". High bias model SKP25.611U1 is a 1:1 air/gas proportionator with a factory installed spring for 0.4" to -4.0" w.c. bias.



NOTE:
1. To avoid oscillation, do not oversize the VGxxx.xxxU valve body (see *Technical Instructions,* N7636us and N7631us).
2. SKP25.4xxUx models must not be used as proportionators.

Operation continued

(see Figure 3)

SKP55.xxxUx

During the burner pre-purge period, when the gas valve is closed, only the air pressure difference acts on the regulator causing the air diaphragm to move and close the regulating hydraulic bypass valve. When the actuator is powered, the gas valve begins to open. The downstream gas pressure difference immediately begins to increase until the gas pressure difference is in balance with the air pressure difference (in accordance with the pressure ratio adjusted on the regulator). The bypass valve is now partially open so that the oil flow supplied by the pump is identical to the return flow.

If, for example, heat demand increases, the air damper opens further increasing the differential air pressure. The SKP55.xxxUx air diaphragm moves and causes the bypass valve to close and the gas valve to open further. The opening of the gas valve increases the differential gas pressure moving the gas diaphragm to the right until balance is restored and the flow supplied by the pump is once again identical to the return flow through the regulator bypass.
Unlike conventional direct acting regulators, the SKP55.xxxUx servo operated regulating system displays virtually zero drop (offset) across the turndown range.

☞ **NOTE:**
The SKP55.xxxUx / VGxxx.xxxU is a 1:1 differential pressure air/gas ratio controller. This means that the control adjusts the same pressure difference on the gas side as it senses on the air side. Any other gas to air ratio adjustment will require a modification to one of the restrictions or the installation of an adjustable orifice (this is normally an adjustable metering orifice in the gas line). For this purpose the VGxxx.xxxU gas valve with manual operation kit AGA61 may be used. See gas valve *Technical Instructions* N7636us and N7631us.

☞ **NOTE:**
1. For optimal performance, both the air damper and SKP55.xxxUx /VGxxx.xxxU gas valve must be installed upstream of its pressure differential orifice. For other layouts please consult your authorized Siemens AG Building Technologies Division Products sales representative.
2. To avoid oscillation, do not oversize the VGxxx.xxxU valves (see *Technical Instructions* N7636us and N7631us).

Many burner designs, because of reduced mixing energy at the low fire level, require increased excess air at low fire in order to maintain optimum combustion parameters. To accommodate this requirement the SKP55.xxxUx incorporates a bias adjustment, which allows the characteristic of the regulator to be displaced either towards excess air or reduced air. Pressure fluctuations in the combustion chamber do not influence the performance of the SKP55.xxxUx air/gas ratio controller. There is no need for any compensation circuit.

Operation continued

(see Figure 4)

SKP75.xxxUx

During the burner pre-purge period, when the gas valve is closed, only the air pressure acts on the regulator. This causes the air diaphragm to move to the left and close the regulating hydraulic bypass valve. When the actuator is powered, the gas valve begins to open. The downstream gas pressure immediately begins to increase until the downstream gas pressure is in balance with the air pressure (in accordance with the pressure ratio adjusted on the regulator). The bypass valve is now partially open so that the oil flow supplied by the pump is identical to the return flow.

If, for example, heat demand increases, the air damper would open further increasing the air pressure. The air diaphragm would move to the left, causing the bypass valve to close and the gas valve to open further. The opening of the gas valve increases the downstream gas pressure moving the gas diaphragm to the right until balance is restored and the flow supplied by the pump is once again identical to the return flow through the regulator bypass. Unlike conventional direct acting regulators the SKP75.xxxUx servo operated regulating system displays virtually zero droop (offset) across the turndown range.

The gas to air pressure ratio is adjustable from 0.4:1 to 9:1. The setting is visible through a window in the regulator. Once set, the gas to air pressure ratio remains constant over the entire output range. The gas to air flow ratio will remain constant (if the cross sections of the air and gas orifices in the burner head are fixed). The SKP75.xxxUx is not recommended for use with burners incorporating a sliding / continuously adjustable head arrangement.

Many burner designs, because of reduced mixing energy at the low fire level, require increased excess air at low fire in order to maintain optimum combustion parameters. To accommodate this requirement the SKP75.xxxUx incorporates a bias adjustment, which allows the characteristic of the regulator to be displaced either towards excess air or reduced air. Pressure fluctuations in the combustion chamber do not influence the performance of the SKP75.xxxUx air/gas ratio controller. There is no need for any compensation circuit.



NOTE:
To avoid oscillation, do not oversize the VGxxx.xxxU valves (see *Technical Instructions*, N7636us and N7631us).

Installation

WARNING:
- Personal injury or loss of life may occur if procedures are not followed as specified.
- All installations must be performed by qualified personnel only.
- Do not pull the actuator shaft.
- The AGA66 gasket must be installed between the actuator and the gas valve body to provide NEMA 3, 3R, and 4 protection rating for VGG10.xxxU and VGDxx.xxxU valves if a liquid-tight conduit connection is used.
- Verify proper operation after servicing

NOTE:
Wiring must meet all relevant electrical codes.

- The SKPx5.xxxUx actuator is directly coupled to the VGxxx.xxxU series valve body by four premounted 4 mm Allen (R) key screws.
- The square mounting flange can be rotated in steps of 90° to provide four different mounting positions. The SKPx5.xxxUx actuator can be mounted in any position with the diaphragms vertical, except upside down.
- The actuator can be mounted or replaced while the valve body is under pressure.
- The SKPx5.xxxUx actuator has two knock-outs for the installation of 1/2”-14 NPSM conduit connections.
- When conduit routing is connected, flexible conduit must be used.
- Liquid tight flexible conduit must be used in combination with AGA66 to provide NEMA 3, 3R, and 4 protection.
- The terminal marked GND, located above the wiring terminals, must be connected to the electrical ground. A torque of 1.5…2 Nm has to be applied.

The pressure pick-up connections must be flush with the inner wall of the pipe or housing in order to sense turbulence-free pressures. The pressure pick-up connections should be located at least 5 pipe diameters downstream of the valve, damper, elbow, coupling, orifice, or other flow disturbing fitting. Using the taps on the valve body for gas connection to the regulator may show turbulence.

SKP25.xxxUx, SKP55.xxxUx and SKP75.xxxUx

- If minimum gas pressure detection is required, the pressure switch must be mounted upstream of the regulating gas valve or if mounted downstream electrically by-passed to ensure sufficient gas pressure before starting the burner. If mounted downstream.
- The gas pressure sensing line must be at least 1/4-inch inside diameter.
- The pressure connection pipe should be as short as possible to allow the regulator to react to sudden changes.

Installation continued

SKP55.xxxUx

The pressure connection pipes should be as short as possible to allow the regulator to react to sudden changes. In cases where it is not possible to install an orifice in the air line, (e.g., lack of available air pressure) the SKP55.xxxUx actuator may be connected to the air pressure upstream of the burner and the combustion chamber pressure, using the pressure differential across the burner orifice. This arrangement is not applicable to installations utilizing combustion air preheating systems.

SKP25.xxxUx

Depending on the application and applicable installation regulations, measures to detect and avoid a downstream overpressure situation might be required. To avoid excessive gas pressure downstream of the regulator SKP25.xxxUx, a maximum pressure switch shall be used to switch off the SKP25.xxxUx/VGxxx.xxxUx. The downstream gas pressure and the gas flow will consequently be shut off. The gas release downstream SKP25.xxxUx/VGxxx.xxxUx will be limited to the period for overpressure detection and shut off.
Depending on the upstream gas pressure, a vent limiter AGA25.2 or AGA25.3 may need to be installed into the connection marked AIR/VENT on the SKPx5. More specific information about applying the AGA25.x can be found in the "Accessories" section. If required, a 1/4" Rp vent line can be connected with or without the AGA25.x vent limiter installed.

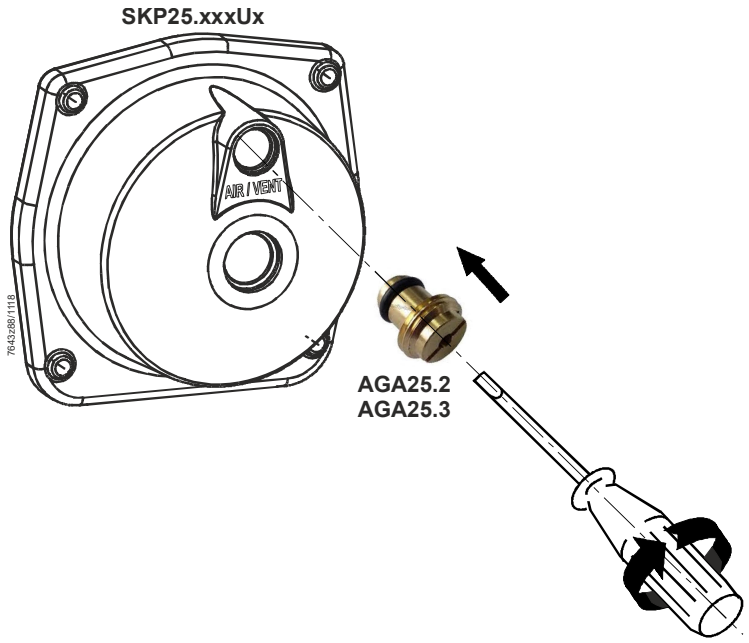


Figure 6. SKP25.xxxUx Connection for venting and installation of the AGA25.2/AGA25.3

Installation continued

SKP55.xxxUx

The pressure connection pipes should be as short as possible to allow the regulator to react to sudden changes. In cases where it is not possible to install an orifice in the air line, (e.g., lack of available air pressure) the SKP55.xxxUx actuator may be connected to the air pressure upstream of the burner and the combustion chamber pressure, using the pressure differential across the burner orifice. This arrangement is not applicable to installations utilizing combustion air preheating systems.

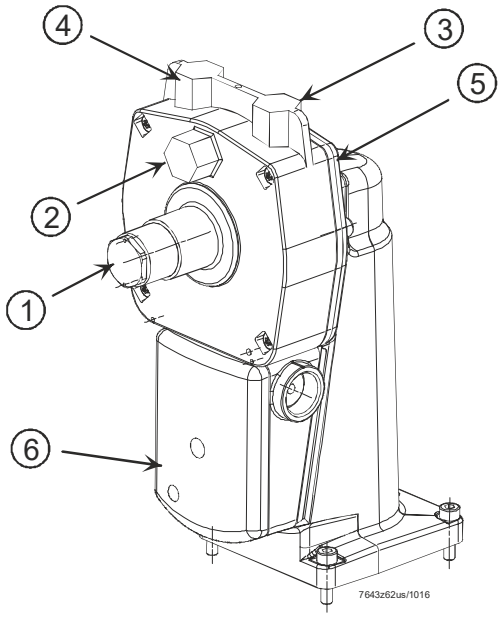


Figure 7. SKP55.xxxUx Connections and adjustments

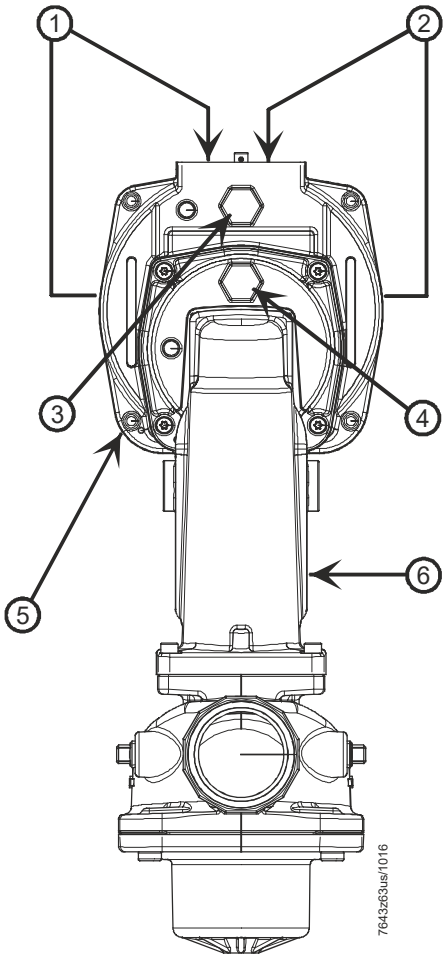
1 Adjustment of the bias (behind cap)
2 Connection for the air pressure (+) sensing line
3 Connection for the air pressure (-) sensing line
4 Connection for the gas pressure (-) sensing line
5 Connection for the gas pressure (+) sensing line
6 Stroke indication

Installation continued

SKP75.xxxUx

- Air proving safety device normally required to guarantee minimum airflow must also be provided when using the SKP75.xxxUx.
- The sensing line for the combustion chamber pressure (if needed) must be installed so that condensing flue gases cannot enter into the regulator but run back into the combustion chamber. If necessary, a water separator must be installed.
- Air pressure sensing lines must be at least ¼-inch inside diameter. For air/gas pressure ratios over three, the air and combustion pressure sensing lines must be at least 3/8-inch inside diameter.
- The SKP75.xxxUx does not work in installations with negative air pressure unless a higher negative chamber pressure is connected to the regulator.

NOTE:
Wiring must meet all relevant electrical standards.



1 Adjustment and indication of the air/gas ratio
2 Adjustment and indication to the bias
3 Connection for the combustion chamber pressure sensing line
4 Connection for the gas pressure sensing line
5 Connection for the air pressure sensing line (on the front)
6 Position indication (on the front)

Figure 8. SKP75.xxxUx Connections and adjustments

Start-up

Regulator



WARNING:
When firing at maximum burner capacity, ensure that the SKPx5.xxxUx / VGxxx.xxxU is not in the fully open position. If this is the case, either the gas valve is sized too small or the gas supply pressure is too low.

SKP25.xxxUx

The gas outlet pressure setpoint adjustment screw is located in the center of the regulator cover. The SKP25.0xxUx models are available with three interchangeable setpoint springs for an adjustable range of 0” to 100” w.c. The SKP25.411Ux models are available with two interchangeable setpoint springs for an adjustable range of 1.5 to 20 psi. The bias for the SKP25.611U1 model is adjustable from 0.4" to -4.0" w.c. (see *Specifications* and Table 1). Clockwise rotation of the setpoint adjustment screw increases the outlet gas pressure. The hexagonal cap must be tightened after the setpoint screw has been adjusted and may be sealed from tampering by means of a wire and lead seal.

Start-up continued

SKP55.xxxUx

1. The setting screw 1 on the SKP55.xxxUx is factory-adjusted so that the air/gas ratio curve intersects the zero point (no bias). If required, on-site adjustment may be achieved as follows:
   - Turn setting screw 1 counterclockwise until spring becomes completely loose.
   - Shut off gas supply upstream of the SKP55.xxxUx actuator.
   - Make sure that there is no air pressure working on the SKP55.xxxUx actuator.
   - Apply power to the SKP55.xxxUx actuator.
   - Turn the setting screw clockwise until valve starts to open.
2. Set the adjustable orifice to the pre-calculated value so that equal pressure difference on both air and gas side results in approximate stoichiometric combustion.
3. Start the burner and run it at approximately 90% capacity by opening the air damper.
4. Measure the combustion values and correct the flow using the adjustable orifice until optimum values are obtained.
5. Return to low fire position by closing the air damper and check the combustion values. If necessary, correct the working characteristic until optimum values are obtained by rotating the setting screw 1. To obtain more gas: rotate clockwise. To obtain less gas: Rotate counter-clockwise.
6. Limit the low fire air damper position (e.g. by cam switch adjustment).
7. If a substantial bias of the working characteristic was needed the adjustment of the 90% position must be checked and corrected, if necessary, by adjusting the orifice. Repeat the procedure from Step 3.
8. Run the burner to the required high fire position and limit the air damper position.
9. Check flue gas values at several intermediate output levels. If corrections are necessary, note:
   - At high fire, correct with the adjustable orifice.
   - At low fire, correct with setting screw 1 on the SKP55.xxxUx actuator.

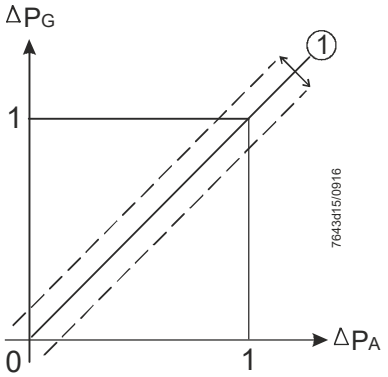


Figure 9. SKP55.xxxUx Adjustments

Start-up continued

SKP75.xxxUx

The pressure ratio and bias adjustment screws are located on top of the regulator under a sealable cover plate. The actual settings can be seen through windows on each side of the regulator.

NOTE:
The burner capacity is controlled by the position of the air damper. The combustion quality (air/gas ratio) is controlled by the settings on the regular (the + and - indications relate to the change in gas flow). Adjustment in clockwise direction decreases the gas flow.

1. Set the air/gas ratio to the desired value using adjusting screw 1 (coarse setting).
2. Start the burner and run it at approximately 90% of full capacity.
3. Measure CO2 or O2 content in the flue gases and correct the ratio by adjusting screw 1 until optimum values are obtained (fine setting).
4. Return to low fire position and measure the CO2 or O2 content in the flue gases. If necessary, correct the setting by adjusting screw 2 (Figure 7) until optimum values are obtained.
5. Limit the damper position for low fire operation. If considerable bias adjustment was necessary to achieve optimum combustion, repeat the procedure from step 3.
6. Run the burner to the required high fire position and limit the air damper position.
7. Check flue gas values at several intermediate output levels. If corrections are necessary, note the following:
   - Adjust the pressure ratio screw 1 at high operation only.
   - Adjust the bias screw 2 at low fire operation only.

If the air pressure exceeds the maximum value of 12" or 20" w.c. (see *Specifications*), the pressure must be reduced with a pressure reducing T-fitting (AGA78).

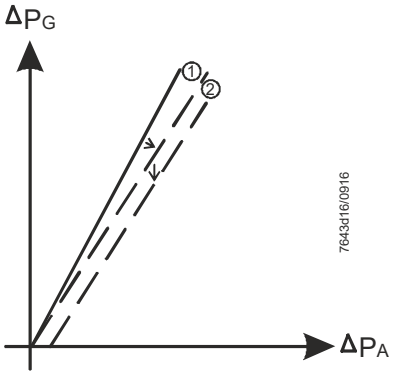


Figure 10. SKP75.xxxUx Adjustments

Pressure Reducing T-Fitting AGA78

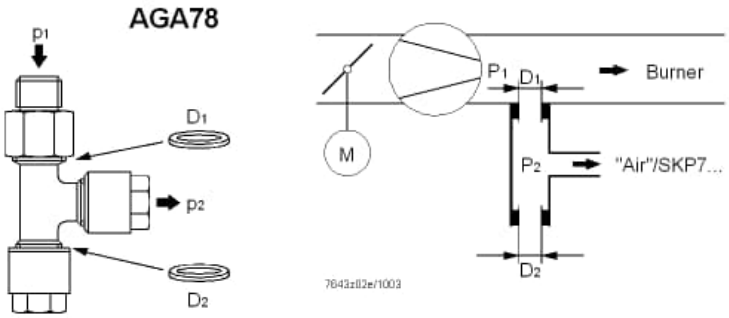


Figure 11 AGA78 Operation.

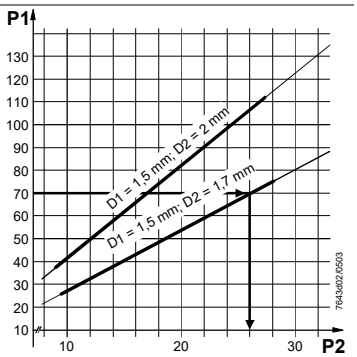


Figure 12. AGA78 Adjustments.

Function

The air is blown out continuously into the atmosphere through the restrictor D2. The air undergoes a drop in pressure across the restrictor D1. The relationship is shown in the diagram (Figure 12).

Example:
Given p1 = 70 mbar, D1 = 1.5 mm, D2 = 1.7 mm
Find: Pressure signal P2 for SKP75.xxxUx
P2 = 26 mbar

Reducing T-fitting AGA78 is supplied ready for mounting, complete with D1 = 1.5 mm and D2 = 1.7 mm. An additional restrictor D2 with a diameter of 2 mm is included with the actuator.

Wiring and switch adjustment

(See *Terminal designations*)

- The actuator is equipped with spring-loaded terminals for 14 AWG wires.
- The actuator has two line and two neutral terminals. Both can be connected to other devices.
- Insert one wire into the opening of the terminal while pressing the lever downward with a screwdriver. Make sure that all strands insert into the opening.
- Adjust the auxiliary switch (if provided) according to the wiring diagram on the label below the terminals (see Figure 12). The adjustment screw and scale are located on the right side of the terminal box, and are visible through the transparent portion of the terminal cover.

☞ **NOTE:**
1. The auxiliary switch is adjustable between 40% and 100% of the stroke. The factory setting is at 40%.
2. The auxiliary switch must not be used for proof of closure detection or other safety interlock functions.
3. The Proof of Closure Switch is non-adjustable.

Service

There are no serviceable parts on the SKPx5.xxxUx series actuators. If inoperative, replace the entire actuator. Tag wires before servicing.

Terminal designations

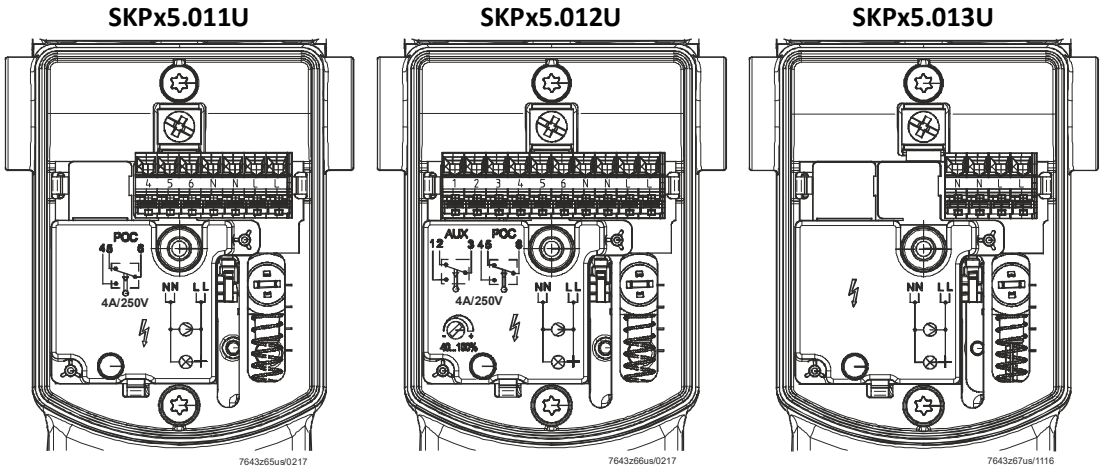


Figure 13. Terminal designations

Dimensions

Dimensions in inches; millimeters [mm] in brackets

SKP15.xxxUx

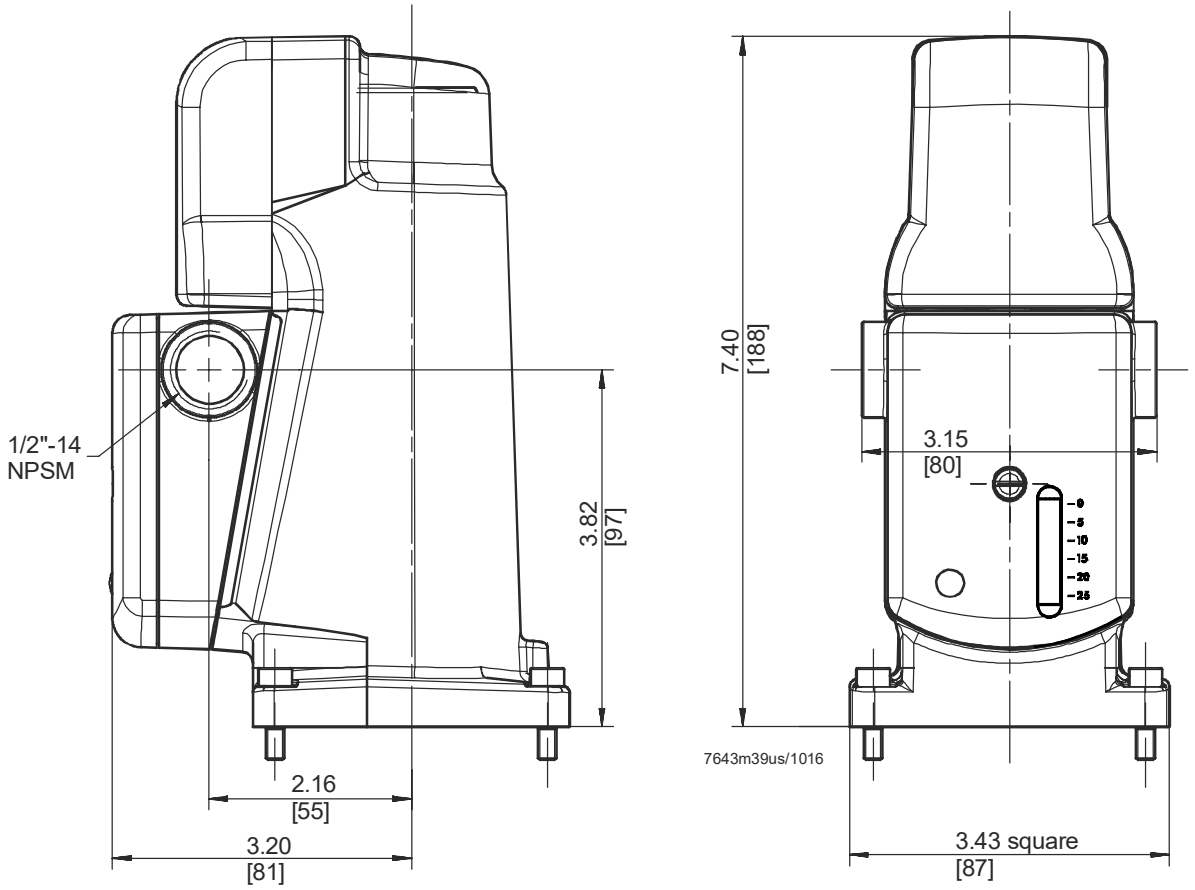


Figure 14. SKP15.xxxUx dimensions

Dimensions continued

Dimensions in inches; millimeters [mm] in brackets

SKP25.0xxUx

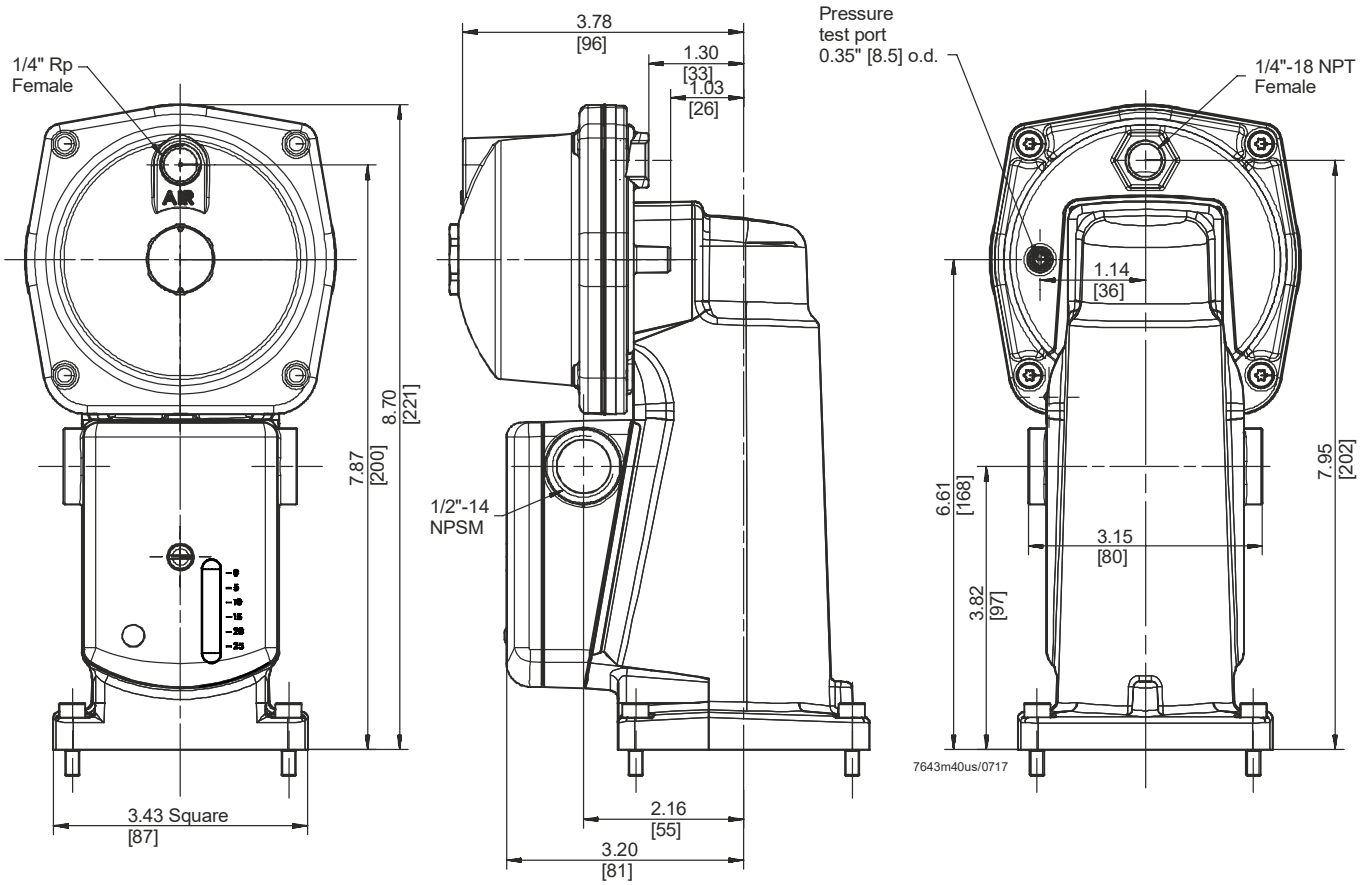


Figure 15. SKP25.0xxUx dimensions

Dimensions continued

Dimensions in inches; millimeters [mm] in brackets

SKP25.4xxUx

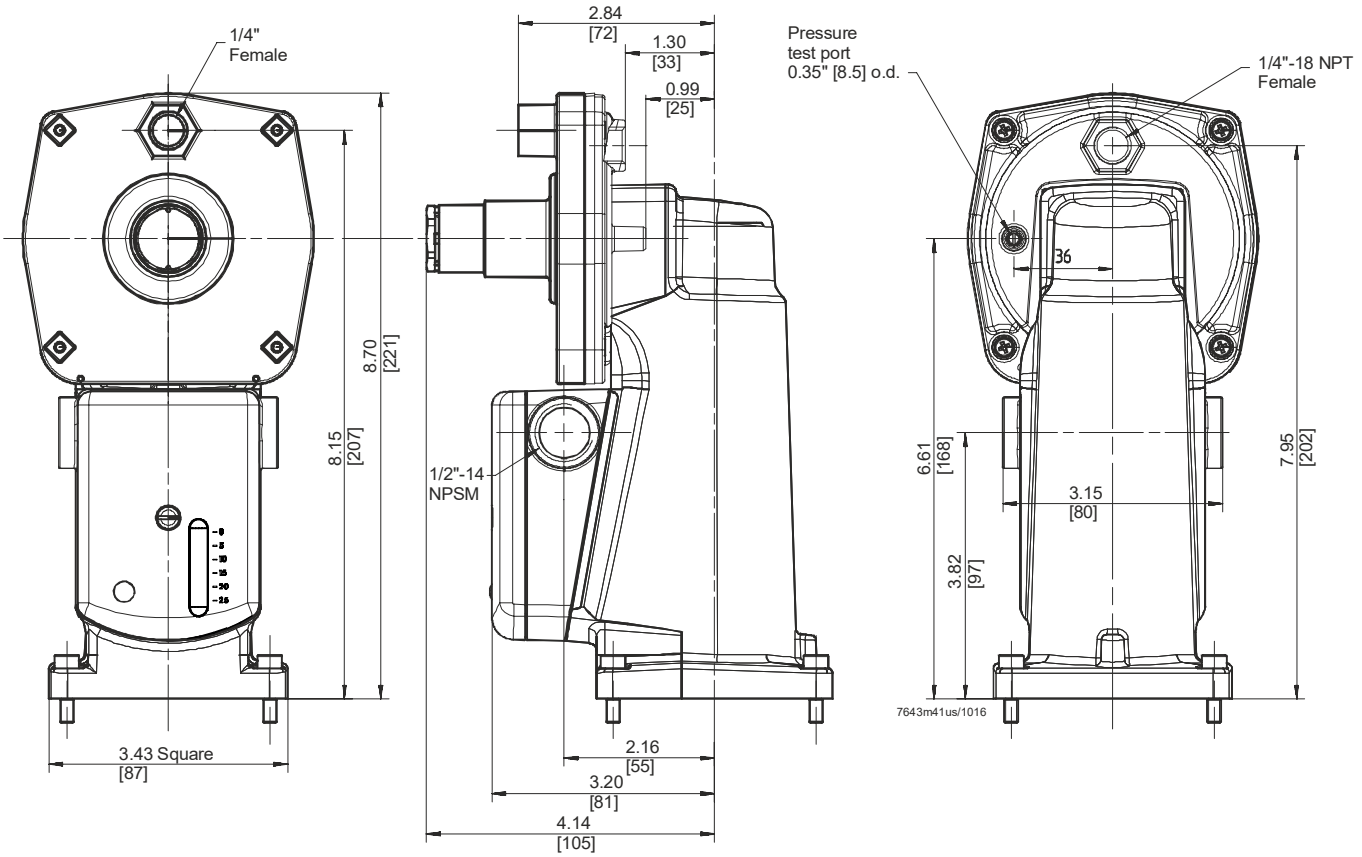


Figure 16. SKP25.4xxUx dimensions

Dimensions continued

Dimensions in inches; millimeters [mm] in brackets

SKP55.xxxUx

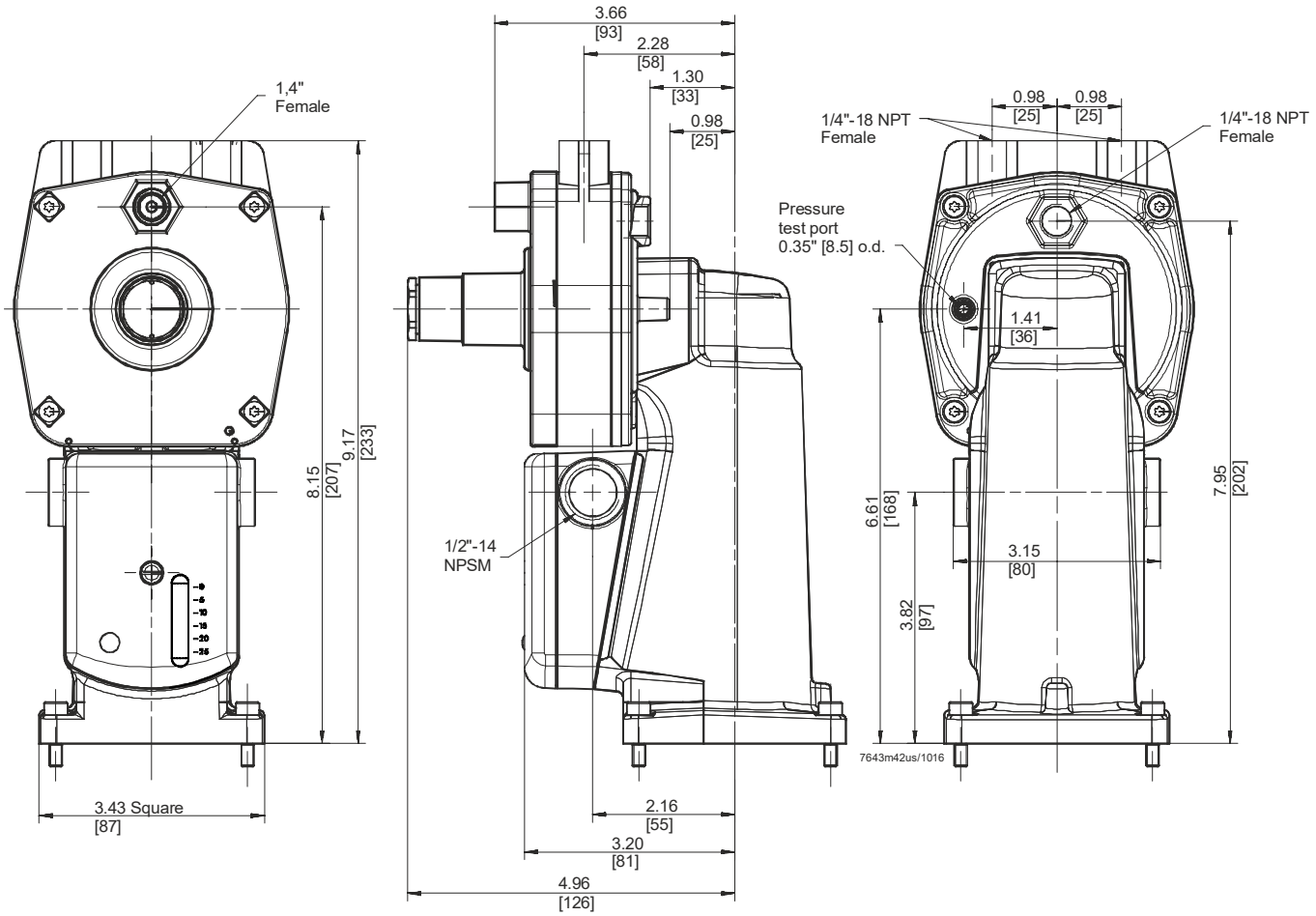


Figure 17. SKP55.xxxUx dimensions

Dimensions continued

Dimensions in inches; millimeters [mm] in brackets

SKP75.xxxUx

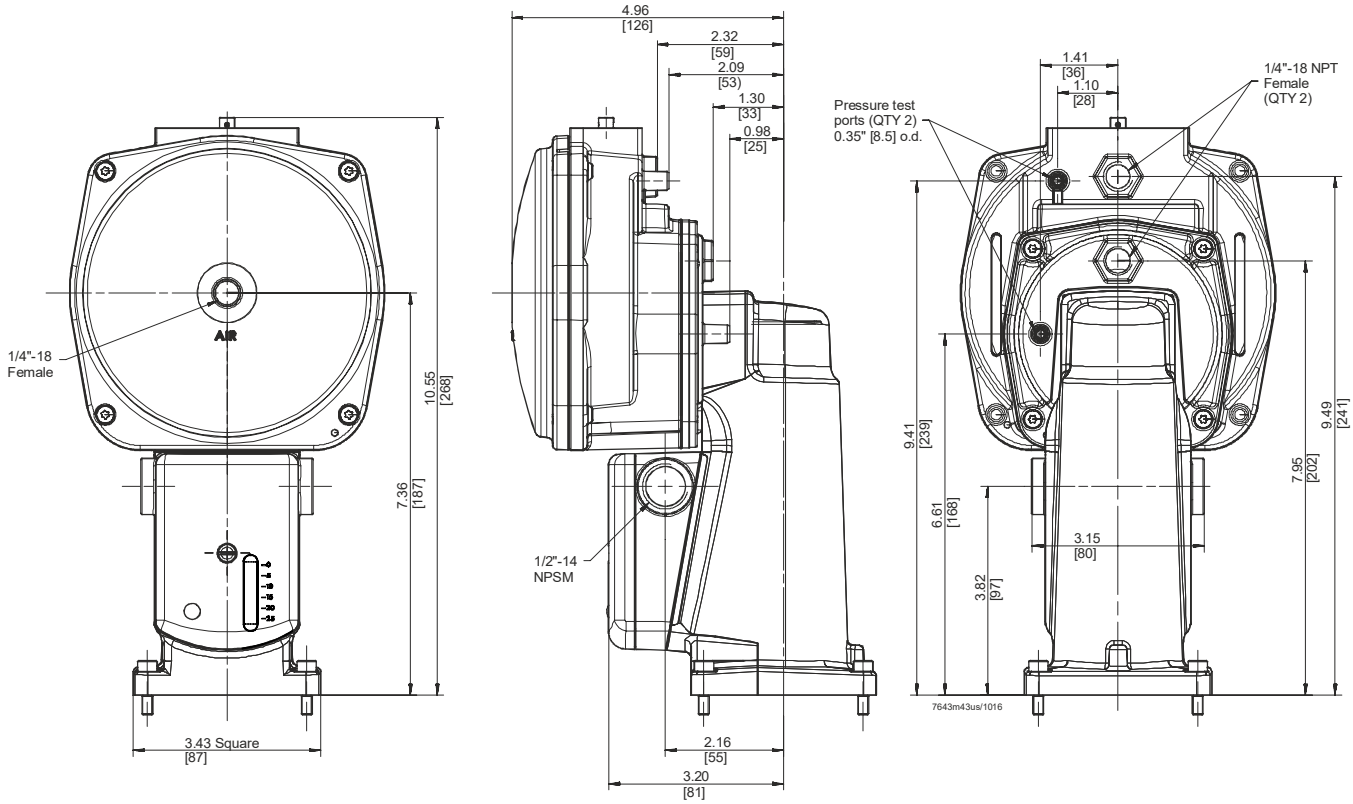


Figure 18. SKP75.xxxUx dimensions

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