



Proportional controlling element

VKP...

Proportional controlling element designed for fitting between counter-flanges, for integration into gas trains.

- Wide modulation range
- Flanged connections 1/2...2"
- Angular rotation 90°
- Maintenance-free
- Suited for use with gases of families I...III and air
- For use with actuators SQN7... or SQM4...
- Can be attached to VGD2... double gas valves

The VKP... and this Data Sheet are intended for use by OEMs which integrate the controlling elements in their products!

Use

Proportional controlling element for the control of gas or air volume in combustion plants with demanding requirements, such as ...

- proportional increase of volumetric flow across angular rotation of 0...90°,
- small start volume/extremely small volume,
- wide modulation range of >1:25,
- high positioning cycle frequencies.



Note!

For supplementary documentation, refer to *Accessories*.

Warning notes



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

Do not interfere with or modify the controlling element!

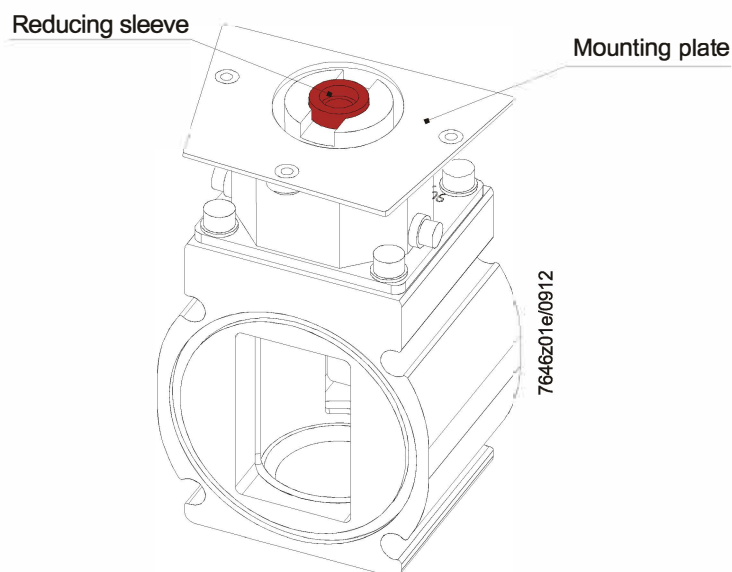
- All activities (mounting, installation and service work, etc.) must be performed by qualified personnel
- Fall or shock can adversely affect the safety functions. Such **controlling elements** must not be put into operation, even if they do not exhibit any damage
- The VKP... must be used in connection with the actuators specified in this Data Sheet
- The VKP... is only suited for the applications covered by this Data Sheet. If not observed, there is a risk of personal injury or damage to property
- The VKP... is intended for exclusive use by OEMs/heating installers. If not observed, there is a risk of personal injury or damage to property

Mounting notes

- Ensure that the relevant national safety regulations are complied with
- Proportional controlling element, actuator and mounting plate can be straightforwardly assembled on site. Special tools are not required
- The 0°-position of the VKP... and the 0°-position of the actuator must correspond
- When the actuator is correctly positioned in relation to the mounting plate, secure the actuator and then the coupling
- Observe the direction of flow and the maximum permissible inlet pressure

ASK33.1

- When using the SQM... actuator (axis dia. 10 mm) in place of the SQN... (axis dia. 8 mm), the center part of the coupling (red reducing sleeve) is removed and the larger mounting plate ASK33.1 be mounted

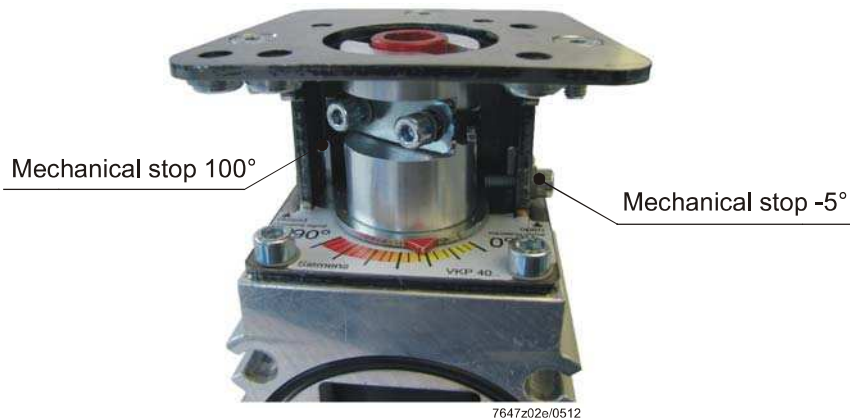


Commissioning notes

Commission the proportional controlling element only when mounting plate, flange and the respective actuator are correctly assembled.

Option when used in connection with burner control LMV2.../LMV3...

A screw can be fitted to provide a mechanical stop either at an angular position of approx. -5° (fully closed) or approx. 100° (fully open). The VKP... is supplied with the mechanical stop at 5° . Depending on the position of the stop, the reference travel (LMV2.../LMV3... parameters) predefined for the relevant actuator is prevented. Incorrectly fitted or interchanged air or gas actuators can thus be detected (also refer to Basic Documentation LMV2.../LMV3...).



Note!

- ☐ Mechanical stop OPEN at -5° fully closed
- ☐ Mechanical stop CLOSED at 100° fully open

Standards and certificates



Conformity to EEC directives
- Directive for gas-fired appliances

2009/142/EC



ISO 9001: 2008
Cert. 00739



ISO 14001: 2004
Cert. 38233

Approved according to EN 13611: CE-0085

Service notes

- The VKP... is maintenance-free
- The VKP... must be commissioned again when mounting plate and actuator are correctly fitted and coupling is fixed
- Check tightness when fitting or replacing flanges

Disposal notes



Prior to disposal, the VKF... must be dismantled and separated into its various materials. Local and currently valid legislation must be observed. The VKP... does not contain electronic components.

Mechanical design

Proportional controlling element VKP...	- Housing with rotation cylinder and coupling - Basic mounting plate for actuator SQN7...
Mounting plate ASK33.1	In all cases, a larger ASK33.1 mounting plate is required to assemble the SQM4... actuator and the VKP... (see <i>Accessories</i>).
Connecting flanges AGF...	When mounting the VKP... in a gas pipe, 2 connecting flanges AGF... are required. See Mounting Instructions 7431908430 (M7646).

Type summary

Product no.	Housing size	Nominal size of built-in rotation cylinder with flow rate/characteristic at relative valve size	Available flange sizes at AGF...
VKP40.15	DN 40	15	1/2"
VKP40.20	DN 40	20	3/4"
VKP40.25	DN 40	25	1"
VKP40.32	DN 40	32	1 1/4"
VKP40.40	DN 40	40	1 1/2"
VKP40.50	DN 40	50	2"

See Mounting Instructions 7431908430 (M7646).

Suitable actuators	Example 1)	Running time in s	Cam switch no.	Mains voltage	Potentiometer	Degree of protection	Availability
SQM33...	2.a - 2.c 3.a - 3.h	---	---	AC 230 V	---	IP54	
SQM40.xx5xxx	2.a - 2.c 3.a - 3.h	---	5	AC 230 V	---	IP54	
SQM45.295A9	2.a - 2.c 3.a - 3.h	---	---	AC 230 V	---	IP54	
SQN30.102A2710	1.a - 1.h	4.5	5	AC 230 V	ASZ12.803	IP40	On request
SQN30.402A1710	1.a - 1.h	30	5	AC 110 V	ASZ12.803	IP40	On request
SQN30.402A2710	1.a - 1.h	30	5	AC 230 V	ASZ12.803	IP40	On request
SQN72.2C4A21	1.a - 1.h	4	4	AC 230 V	ASZ12.30	IP54	On request
SQN72.6C4A21	1.a - 1.h	30	4	AC 230 V	ASZ12.30	IP54	

1) According to Mounting Instructions 7431908430 (M7646)

Ordering

Proportional controlling element, actuator and mounting plate, if required, must be ordered as individual items.

When ordering, please give quantities, descriptions and product nos.

Example:

- 1 proportional controlling element VKP40.50
- 1 mounting plate ASK33.1 (only if SQM33... or SQM4... is used)
- 1 actuator SQM40.165A20
- 2 flanges AGF50

Delivery	Proportional controlling element, actuator, mounting plate and flanges are packed and delivered as separate items.
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Accessories

Mounting plate
ASK33.1



Mounting plate ASK33.1

- Larger mounting plate to replace existing mounting plate when using actuators SQM4... or SQM33...

Connecting flanges
AGF...

Connecting flanges AGF...

- The following flange types with connection thread are available:

Connection thread	Product no. of connecting flange (Rp)	US version (NPT)
1/2"	AGF10.15	AGF10.15U
3/4"	AGF10.20	AGF10.20U
1"	AGF10.25	AGF10.25U
1 1/4"	AGF10.32	AGF10.32U
1 1/2"	AGF10.40	AGF10.40U
2"	AGF10.50	AGF10.50U

Note!

Scope of delivery:

- 1 O-ring
- 4 screws M8x25
- 4 nuts M8
- 4 lock washers 8 mm dia.
- 1 Mounting Instructions



Double nipple

- Required for mounting the gas pressure switch QPL25...
- Double nipple 1/8" to 1/4" (to be provided by supplied by thirds, if required)
- Gas pressure switch QPL15... can be mounted directly on the AGF...

Actuators

Perm. types of actuator	Documentation
SQN30.402A2710	N7808
SQN30.402A1710	N7808
SQM33... (mounting plate ASK33.1 required)	N7813
SQM40.xx5xxx (mounting plate ASK33.1 required)	N7817
SQM45.295A9 (mounting plate ASK33.1 required)	N7814
SQN72.4C4A21	N7804
SQN72.6C4A21	N7804

Fixing material

Fixing material

- To fix the controlling element to a VGD2... double gas valve and to fit the flanges and secure the actuator, the VKP... is supplied with the following material:

Accessories	Number of	Type of package	Size	Mounting location	Remarks
Screws	3		M5x40		3 screws to secure the SQN3...
Screws	4	Together in plastic bag	M5x16	Mounting plate ASK33.1	3 screws to secure the SQN7... 4 screws to secure the SQM4... or SQM33...
Screws	4		M8x95	AGF... fixed to VGD2...	For fixing
Spacers	4		To M8 (10 mm long)	Directly fixed to VGD2...	For screws M8, to be fitted under the head
Double-O-ring	1	Individually in plastic bag	---	Directly fixed to VGD2...	To be fitted between VGD2... and VKP....
Mounting Instructions	1	Folded	A7	---	---

Technical data

General unit data	Types of gas	Gases of families I...III or air Max. 0.1% H ₂ S
	Operating pressure	Max. 70 kPa (700 bar)
	Mounting positions	Optional
	Leakage rate	Inside, in the fully closed position 0.7 m ³ /h / Δp 50 mbar
	Angular rotation	90°
	CLOSED position to reopening	0...-5°
	OPEN position to reclosing	90...95°
	Mechanical stop	Optionally at approx. -5° / approx. 100°
	Weight	See <i>Dimensions</i>
	Internal volume	106 cm ³
	Material	No non-ferrous metals
	Number of control cycles	500,000 OPEN/CLOSED
Environmental conditions	Storage	DIN EN 60721-3-1
	Climatic conditions	Class 1K3
	Mechanical conditions	Class 1M2
	Temperature range	-20...60 °C
	Humidity	<85% r.h.
	Transport	DIN EN 60 721-3-2
	Climatic conditions	Class 2K3
	Mechanical conditions	Class 2M2
	Temperature range	-20...60 °C
	Humidity	<85% r.h.
	Operation	DIN EN 60 721-3-3
	Climatic conditions	Class 3K3
	Mechanical conditions	Class 3M2
	Temperature range	-20...60 °C
	Humidity	<85% r.h.



Caution!
Formation of ice and ingress of water are not permitted!

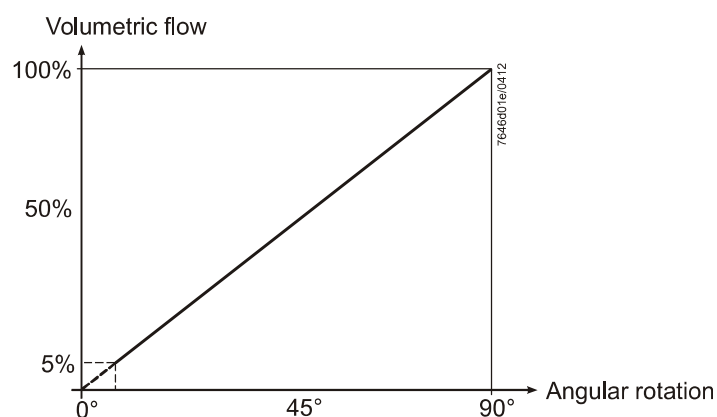
Flow chart

Positioning
characteristic

The differential pressure Δp_{VKP} should be such that positioning characteristic will be as linear as possible.

Δp_{VKP} with rotation cylinder fully open (90°) = 0.25...0.35 * absolute prepressure.

Idealized positioning characteristic:



Flow characteristic with rotation cylinder fully open (90°):

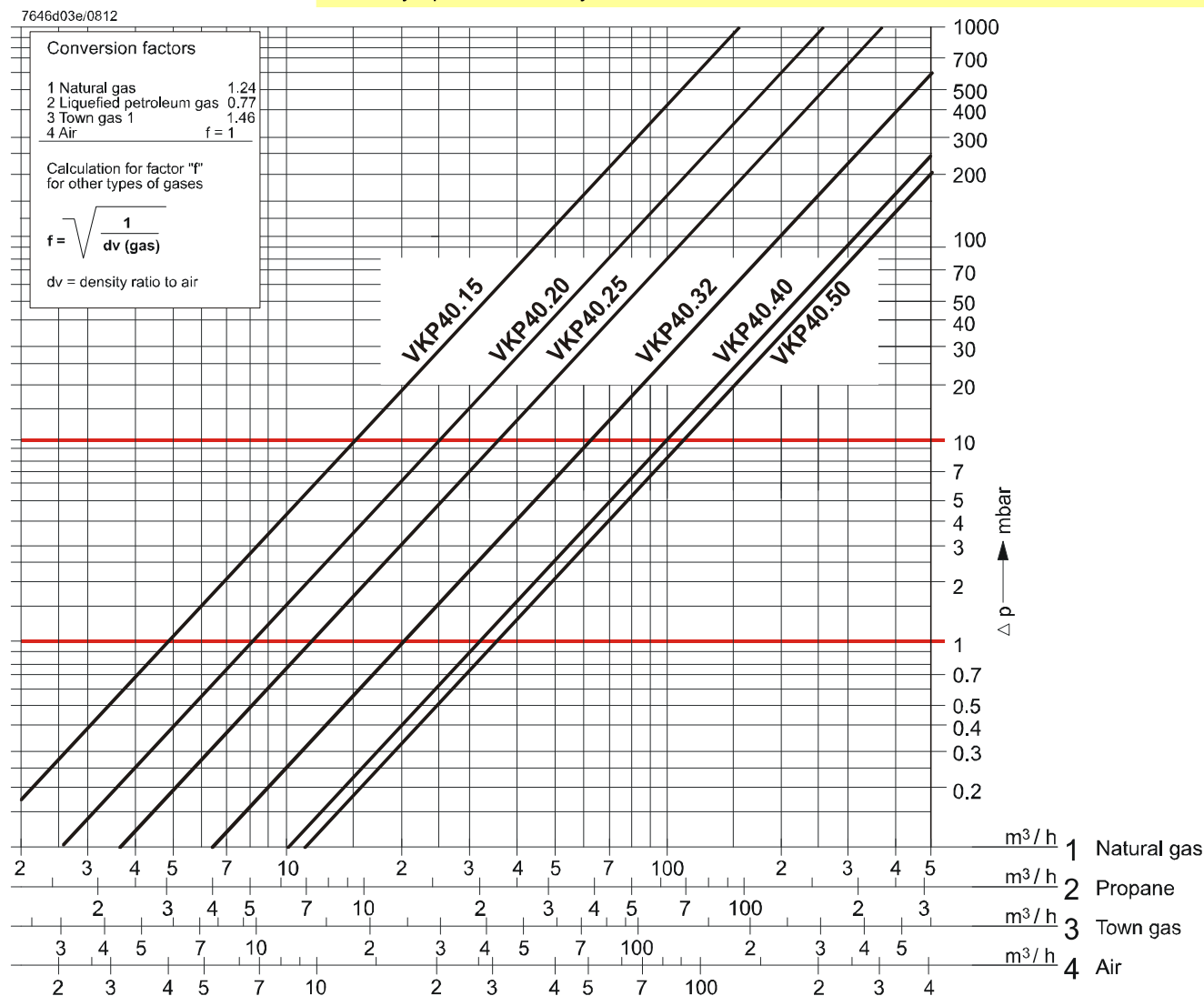
Product no.	Connection	Flanges fitted to both sides	Volumetric flow m ³ /h at Δp 10 mbar when fully open
VKP40.15	1/2"	AGF10.15	15
VKP40.20	3/4"	AGF10.20	25
VKP40.25	1"	AGF10.25	36
VKP40.32	1 1/4"	AGF10.32	63
VKP40.40	1 1/2"	AGF10.40	88
VKP40.50	2"	AGF10.50	112

Flow chart (cont'd)

Flow characteristic



Note!
For fully open VKP... only.



Caution!

- If the gas pressure exceeds the maximum permissible operating pressure, reduce the gas pressure with a pressure controller
- The pressure drop (curves of maximum flow) is based on a fully open rotation cylinder

Conversion of air flow rate to a corresponding gas flow rate (natural gas):

Basis for scale

Abscissa	Medium volumetric flow (QG) in m³/h	Density ratio (dv) to air	Conversion factor $f = \sqrt{\frac{1}{dv}}$
1	Air	1	1
2	Natural gas	0.61	1.28
3	Propane	1.562	0.8
4	Town gas	0.46	1.47

Conversion to air (m³/h) from
other types of gases:

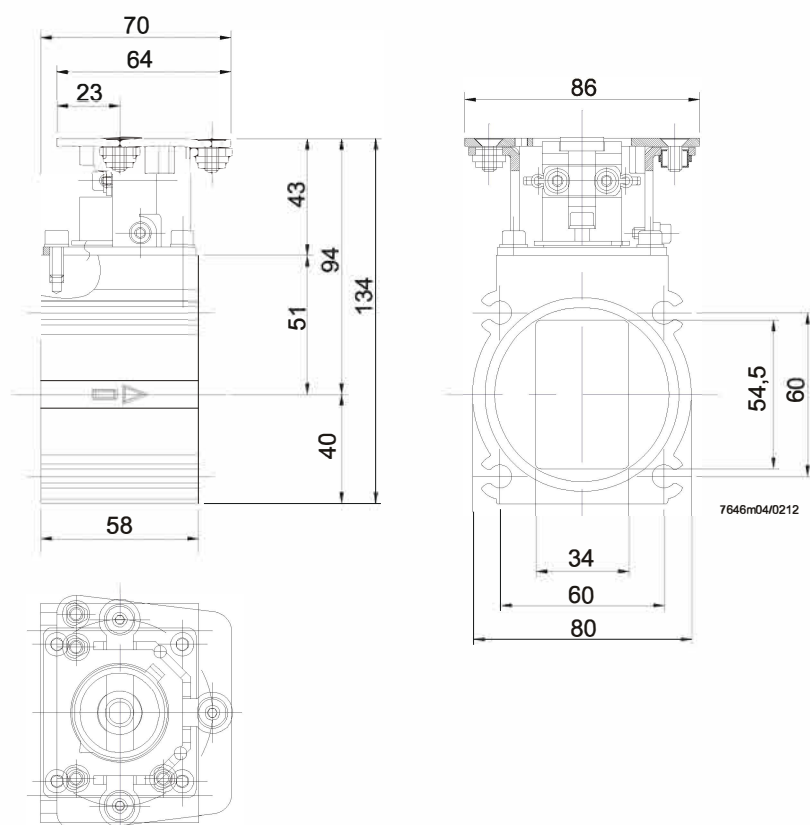
$$QL = \frac{QG}{f}$$

QL = air volume in m³/h that produces the same pressure drop
as QG

Dimensions

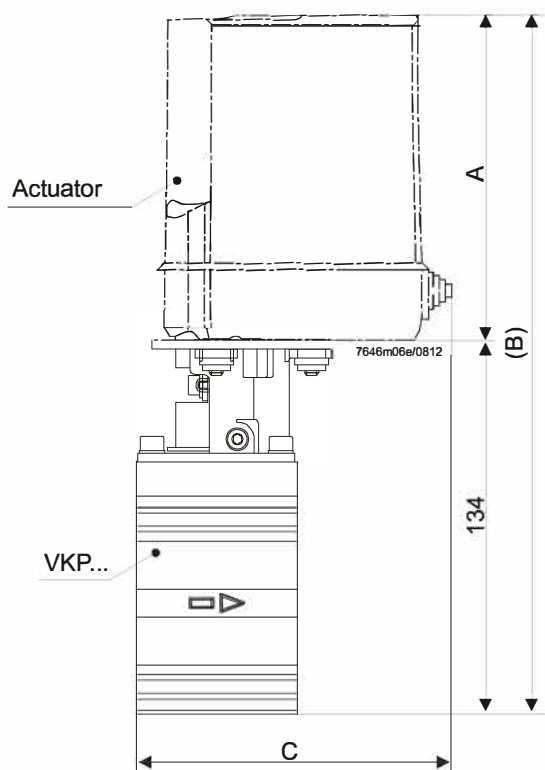
Dimensions in mm

VKP...



Type	Weight [kg]
VKP40.15	1.2
VKP40.20	1.2
VKP40.25	1.2
VKP40.32	1.2
VKP40.40	1.2
VKP40.50	1.2

VKP... with actuator

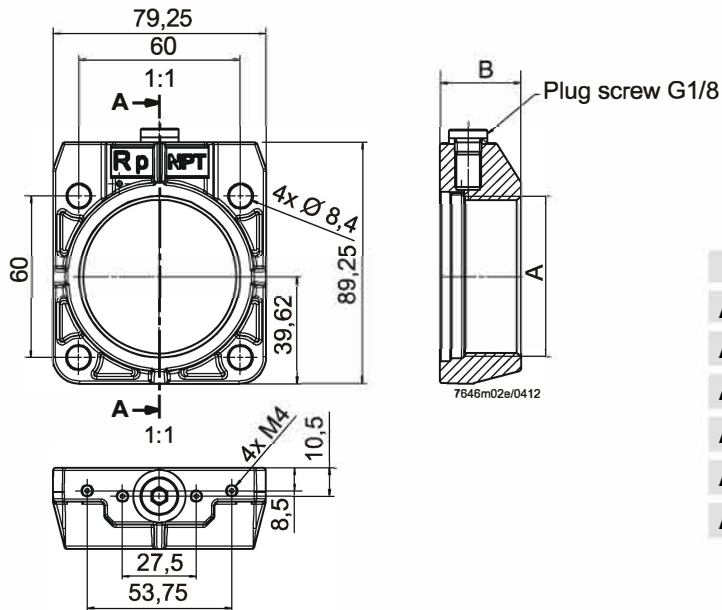


	A	B	C approx.
SQN3...	125	259	100
SQN7...	134	251	100
SQM33...	116	233	130
SQM40...	149	266	150
SQM45...	116	233	130

Dimensions (cont'd)

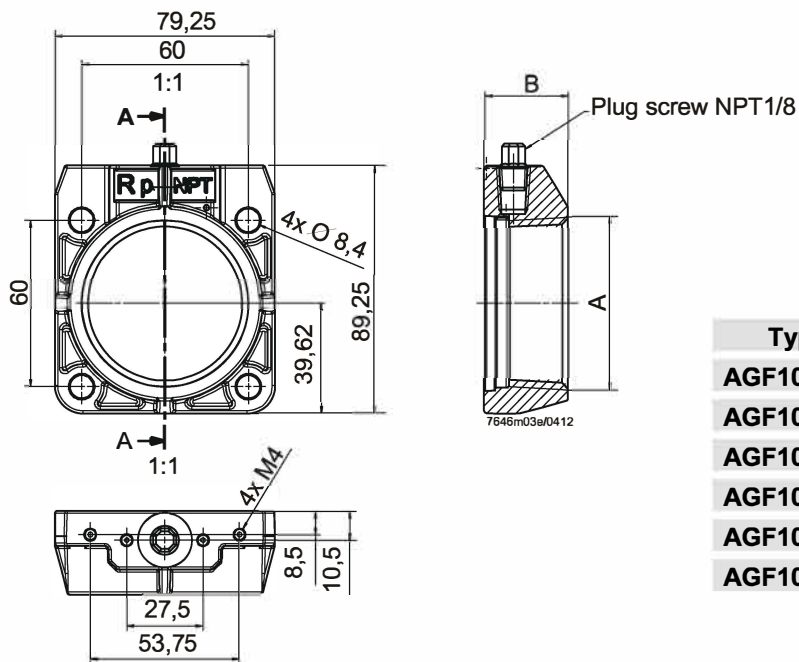
Dimensions in mm

AGF... (Europe)



Type	A	B	Weight [kg]
AGF10.15	RP1/2"	26	0.19
AGF10.20	RP3/4"	26	0.19
AGF10.25	RP1"	26	0.19
AGF10.32	RP1 1/4"	26	0.19
AGF10.40	RP1 1/2"	26	0.19
AGF10.50	RP2"	30	0.19

AGF... (U.S.)



Type	A	B	Weight [kg]
AGF10.15U	NPT1/2"	26	0,19
AGF10.20U	NPT3/4"	26	0,19
AGF10.25U	NPT1"	26	0,19
AGF10.32U	NPT1 1/4"	26	0,19
AGF10.40U	NPT1 1/2"	26	0,19
AGF10.50U	NPT2"	30	0,19

Dimensions in mm

Technical drawing of a square plate with a circular hole and four mounting holes. The drawing includes dimensions for overall size, hole positions, and hole diameters. A section line A-A is indicated. A detail view of the mounting hole shows a 90-degree chamfer and a 5.2mm diameter hole.

Overall dimensions: 90 (width), 136 (height).

Mounting hole positions: 76 ± 0,15 (distance between mounting holes), 122 ± 0,15 (distance from top edge to mounting holes), 14,8 ± 0,1 (distance from side edge to mounting holes).

Central hole: LKR O 68 ± 0,15.

Mounting hole diameter: O 6,5.

Section A-A: 90° (3x) chamfer, O 5,2 (3x) hole diameter.

Other dimensions: 22,3 ± 0,1, 14,8 ± 0,1, O 4,6 ± 0,1 (2x), 22,3 ± 0,1, 33 ± 0,1, O 36, 7646m07e/r0412.



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