

## VKRA: 2-way regulating ball valve with male thread, PN 40

### How energy efficiency is improved

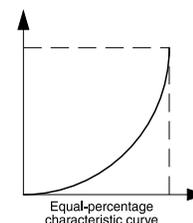
Efficiency means precise control and working with minimum leakage

### Features

- 2-way regulating ball valve for continuous control of cold and hot water in closed circuits
- In combination with valve actuators AKM 105(S), 115(S), 115SA and AKF 112, 113(S) as a control unit
- Equal-percentage ball valve characteristic; control contour in the ball directly integrated
- Characteristic can be set with SUT rotary actuator (SAUTER Universal Technology) to linear or quadratic
- Spindle with large sliding surface and PTFE glide ring
- Low torque due to collar mounted on O-ring
- Ball valve with male thread as per ISO 228-1 (G x" B)
- Body made of DZR (dezincification-resistant) cast brass
- Spindle made of DZR brass with PTFE glide ring
- Ball made of DZR brass, chrome-plated and polished surface
- Spindle seal with double O-ring made of EPDM
- Strainer and screw fitting available as accessories
- Water quality as per VDI 2035



VKRA0\*\*F300



### Technical data

#### Parameters

Nominal pressure	40 bar
Valve characteristic	Equal-percentage
Control ratio of ball valve	500:1
Control ratio with actuator	> 50:1
Leakage rate	Waterproof as per EN 60534-4 L/1, better than class 5
Angle of rotation	90°

#### Ambient conditions

Operating temperature <sup>1)</sup>	-10...130 °C, no condensation
Operating pressure	Liquids: 40 bar (-10...50 °C), 35 bar Gases: 20 bar

#### Standards, directives

Pressure and temperature data	EN 764, EN 1333
Flow parameters	EN 60534 (page 3)

#### Overview of types

Type	Nominal diameter	Connection ISO 228-1	K <sub>VS</sub> value	Weight
VKRA015F350	DN 15	G 1" B	1 m³/h	360 g
VKRA015F340	DN 15	G 1" B	1.6 m³/h	360 g
VKRA015F330	DN 15	G 1" B	2.5 m³/h	360 g
VKRA015F320	DN 15	G 1" B	4 m³/h	360 g
VKRA015F310	DN 15	G 1" B	6.3 m³/h	360 g
VKRA020F320	DN 20	G 1¼" B	4 m³/h	440 g
VKRA020F310	DN 20	G 1¼" B	6.3 m³/h	440 g
VKRA020F300	DN 20	G 1¼" B	10 m³/h	440 g
VKRA025F320	DN 25	G 1½" B	6.3 m³/h	570 g
VKRA025F310	DN 25	G 1½" B	10 m³/h	570 g
VKRA025F300	DN 25	G 1½" B	16 m³/h	570 g
VKRA032F320	DN 32	G 2" B	10 m³/h	840 g
VKRA032F310	DN 32	G 2" B	16 m³/h	840 g

<sup>1)</sup> At operating temperatures <5 °C and >100 °C, the appropriate accessories must be used.



Type	Nominal diameter	Connection ISO 228-1	$K_{vs}$ value	Weight
VKRA032F300	DN 32	G 2" B	25 m <sup>3</sup> /h	840 g
VKRA040F320	DN 40	G 2¼" B	16 m <sup>3</sup> /h	1290 g
VKRA040F310	DN 40	G 2¼" B	25 m <sup>3</sup> /h	1290 g
VKRA040F300	DN 40	G 2¼" B	40 m <sup>3</sup> /h	1290 g
VKRA050F320	DN 50	G 2¾" B	25 m <sup>3</sup> /h	1980 g
VKRA050F310	DN 50	G 2¾" B	40 m <sup>3</sup> /h	1980 g
VKRA050F300	DN 50	G 2¾" B	63 m <sup>3</sup> /h	1980 g

#### Accessories

Type	Description
0510240001	Assembly kit for VK**/BK** ball valves as spare part and as accessory for rotary actuators ASF 112, 113 from index B
0510240011	Adaptor required when temperature of the medium < 5 °C
0510420001	Adaptor required when temperature of the medium > 100 °C
0361951015	Screw fitting for male thread with flat seal, G1 - Rp½
0361951020	Screw fitting for male thread with flat seal, G1¼ - Rp¾
0361951025	Screw fitting for male thread with flat seal, G1½ - Rp1
0361951032	Screw fitting for male thread with flat seal DN 32
0361951040	Screw fitting for male thread with flat seal DN 40
0361951050	Screw fitting for male thread with flat seal DN 50
0560332015	Strainer in gun metal (bronze), -10...150 °C, mesh aperture 0.5 mm, DN 15
0560332020	Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 20
0560332025	Strainer in gun metal (bronze), -10...150 °C, mesh aperture 0.8 mm, DN 25
0560332032	Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 32
0560332040	Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 40
0560332050	Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 50

#### Combination of VKRA with electric actuators

- i** *Warranty: The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators. The warranty does not apply if used with valve actuators from other manufacturers.*
- i** **Definition of  $\Delta p_s$ :** *Maximum admissible pressure drop in the event of a malfunction (pipe break after the ball valve) at which the actuator reliably closes the ball valve using the return spring.*
- i** **Definition of  $\Delta p_{max}$ :** *Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the ball valve.*

#### Pressure differences

Actuator	AKM105F100 AKM105F120	AKM105F122	AKM115F120	AKM115F122
Rotational torque	4 Nm	4 Nm	8 Nm	8 Nm
Control signal	2-/3-point	2-/3-point	2-/3-point	2-/3-point
Running time	30/120 s	30/120 s	120 s	120 s
Operating voltage	230 VAC	24 VAC	230 VAC	24 VAC
Closes against the pressure	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_{max}$ [bar]
VKRA015F350	1.8	1.8	3.5	3.5
VKRA015F340				
VKRA015F330				
VKRA015F320				
VKRA015F310				
VKRA020F320				
VKRA020F310				
VKRA020F300				
VKRA025F320				
VKRA025F310				
VKRA025F300				

Actuator	AKM105F100 AKM105F120	AKM105F122	AKM115F120	AKM115F122
VKRA032F320 VKRA032F310 VKRA032F300 VKRA040F320 VKRA040F310 VKRA040F300 VKRA050F320 VKRA050F310 VKRA050F300	1.2	1.2	2.4	2.4
Cannot be used to close with the pressure				

Actuator	AKM105SF132	AKM115SF132	AKM115SAF232	AKM115SF152
Rotational torque	4 Nm	8 Nm	8 Nm	7 Nm
Control signal	2-/3-point, 0...10 V	2-/3-point, 0...10 V	0...10 V, BACnet MS/TP	2-/3-point, 0...10 V, 4...20 mA
Running time	35/60/120 s	35/60/120 s	35/60/120 s	6 s
Operating voltage	24 VAC/DC	24 VAC/DC	24 VAC/DC	24 VAC/DC
Closes against the pressure	$\Delta p_{\max}$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_{\max}$ [bar]
VKRA015F350 VKRA015F340 VKRA015F330 VKRA015F320 VKRA015F310 VKRA020F320 VKRA020F310 VKRA020F300 VKRA025F320 VKRA025F310 VKRA025F300	1.8	3.5	3.5	3.5
VKRA032F320 VKRA032F310 VKRA032F300 VKRA040F320 VKRA040F310 VKRA040F300 VKRA050F320 VKRA050F310 VKRA050F300	1.2	2.4	2.4	2.4
Cannot be used to close with the pressure				

Actuator	AKF112F120		AKF112F122		AKF113F122		AKF113SF122	
Rotational torque	7 Nm		7 Nm		7 Nm		7 Nm	
Control signal	2-point		2-point		3-point		0...10 V	
Running time	90 s		90 s		90 s		90 s	
Operating voltage	230 VAC		24 VAC/DC		24 VAC/DC		24 VAC/DC	
Closes against the pressure	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]						
VKRA015F350 VKRA015F340 VKRA015F330 VKRA015F320 VKRA015F310 VKRA020F320 VKRA020F310 VKRA020F300 VKRA025F320 VKRA025F310 VKRA025F300	3.5	5.4	3.5	5.4	3.5	5.4	3.5	5.4

Actuator	AKF112F120		AKF112F122		AKF113F122		AKF113SF122	
VKRA032F320								
VKRA032F310								
VKRA032F300								
VKRA040F320								
VKRA040F310	2.4	3.5	2.4	3.5	2.4	3.5	2.4	3.5
VKRA040F300								
VKRA050F320								
VKRA050F310								
VKRA050F300								

Cannot be used to close with the pressure

### Description of operation

The 2-way regulating ball valve can be moved to any intermediate position with an electric actuator. Closing against the operating pressure is possible with actuators AKM 105, 115(S) and 115SA or actuators with spring return AKF 112 and 113(S). Closing with the operating pressure is not admissible.

#### Closes against the pressure



These regulating ball valves are characterised by their reliability and precision and make an important contribution towards environmentally friendly regulation. They meet difficult challenges such as the quick-closing function, overcoming differential pressures, controlling media temperatures and performing the shut-off function, all with a low noise level.

The spindle of the ball valve is automatically connected to the spindle carrier of the actuator. The brass ball controls the equal-percentage flow rate in the control passage. The tightness of the ball is ensured by the PTFE collars incorporated in the body. An O-ring made of EPDM is inserted behind these two collars. These O-rings enable the ball and the two collars to make a small axial movement, providing a high level of tightness and small torques.

The tightness of the spindle is ensured by 2 O-rings. These cannot be replaced.

### Intended use

This product is only allowed to be used in HVAC building systems for control and regulation purposes. Other uses require the prior consent of the manufacturer.

The section "Description of operation" and all product instructions in this data sheet must be observed.

Modifying or converting the product is not permitted.

### Improper use

The VKRA regulating ball valve does not have drinking water approval.

The product is not suitable for use in potentially explosive atmospheres.



#### Notice in accordance with California Proposition 65

The product contains lead. To be marketed in North America, the appropriate warnings must be affixed to the product or packaging.

### Engineering and fitting notes

The ball valves are combined with rotary actuators with or without a spring return. The actuator is mounted directly on the ball valve and fastened with a bayonet connector. The actuator shaft is automatically connected to the spindle, whereby the stem of the ball valve is in an intermediate position. When the system is commissioned, the SUT actuator moves to the open position, and the two devices are connected automatically. The angle of rotation of the ball valve is also detected by the actuator, and no further adjustments are required. With the SUT actuators, the characteristic can be set to linear or quadratic as required. To avoid the ball valve being jammed in the end positions, the SUT actuator makes a movement of approx. 30° angle of rotation if the end positions of the positioning signal have not changed within 3 days.

So that impurities are retained in the water (welding beads, rust particles, etc.) and the PTFE collar is not damaged, it is necessary to install dirt filters, for example one for each floor or pipe run. For dirt filters, see the accessories, and note the usage and temperature range for each type. Requirements for water quality as per VDI 2035.

All ball valves must be used in closed circuits only. In open circuits, an excessively high oxygen mixture can destroy the ball valves. To avoid this, an oxygen binding agent must be used; here the compatibility must be clarified with the manufacturer of the solution with regard to corrosion. The material list shown below may be used here.

The fittings are usually insulated in the systems. However, note that the flange into which the actuator is inserted is not insulated.

To prevent any disturbing flow noise from being audible in quiet rooms, the pressure difference over the ball valve must not exceed 50% of the specified values.

The crank handle is fixed to the actuator. To operate this crank handle, the manual adjustment knob on the actuator must be pushed downwards. The actuator remains inactive until this knob is shifted into the top position again. There is also a squared end on the crank handle that matches the squared end on the spindle of the ball valve.

#### Additional technical data

Pressure and temperature data	EN 764, EN 1333
Flow parameters	EN 60534, page 3
Technical manual on control units	7000477001
Parameters, fitting notes, control, general information	Applicable EN, DIN, and AD standards, TRD rules and accident prevention regulations
CE conformity: PED 2014/68/EU	Fluid group II, no CE label as per PED, art. 4.3
UKCA conformity: Pressure Equipment (Safety) Regulations 2016	Fluid group II, no UKCA label as per PE(S)R, art. 8(3)

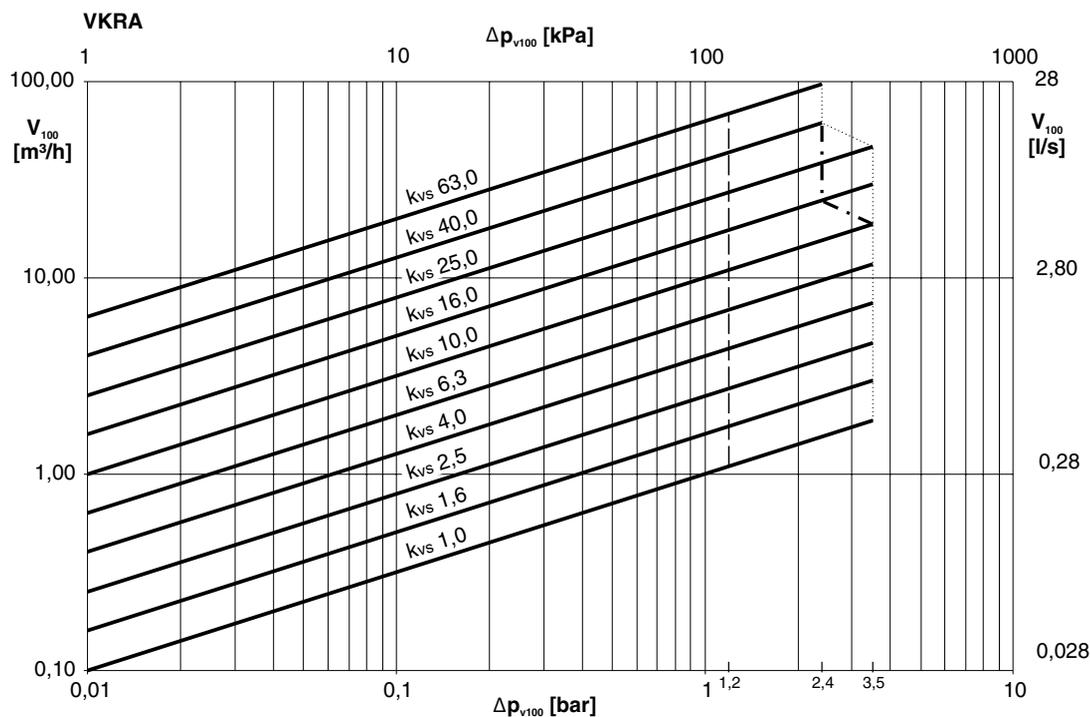
#### Using with water

When using water mixed with glycol or an inhibitor, the compatibility of the materials and seals used in the ball valve should be clarified with the manufacturer. The material list in the Declaration on materials and the environment MD 56.092 can be used for this purpose. When glycol is used, we recommend using a concentration of between 20% and 50%.

#### Fitting position

The control unit can be fitted in any position, but the hanging position is not recommended. Condensate, drops of water, etc. must be prevented from entering the actuator.

## Flow-rate chart



— — — — —

$\Delta p_v = 1,2$  bar

de Luft, Niederdruckdampf  
fr Air, vapeur basse pression  
en Air, low pressure steam  
it Aria, vapore a bassa pressione  
es Aire, vapor baja presión  
sv Luft, Lågtrycksånga  
nl Lucht, lage druk stoom

.....

$\Delta p_v = 3,5$  bar

de Wasser, Wasser-Glycol  
fr Eau, eau-glycol  
en Water, water-glycol  
it Acqua, acqua-glicole  
es Agua, agua-glicol  
sv Vatten, Vatten-Glykol  
nl Water, water-glycol

- - - - -

$\Delta p_v = 2,4$  bar

VKRA / BKRA 032F300  $k_{vs}25$   
VKRA / BKRA 032F310  $k_{vs}16$   
VKRA / BKRA 040F310  $k_{vs}25$

## Additional version information

The body of the ball valve is made of DZR moulded brass (EN 12165) with male thread as per ISO 228-1. Spindle seal with double O-ring made of ethylene propylene.

## Material numbers as per DIN

Component	DIN material no.	DIN designation
Body of the ball valve	CW602N	CuZn36Pb2As
Connector	CW602N	CuZn36Pb2As
Ball, polished, chrome-plated	CW602N	CuZn36Pb2As
Stem	CW602N	CuZn36Pb2As
O-ring	EPDM	
Collar	PTFE	

## Definition of pressure differences

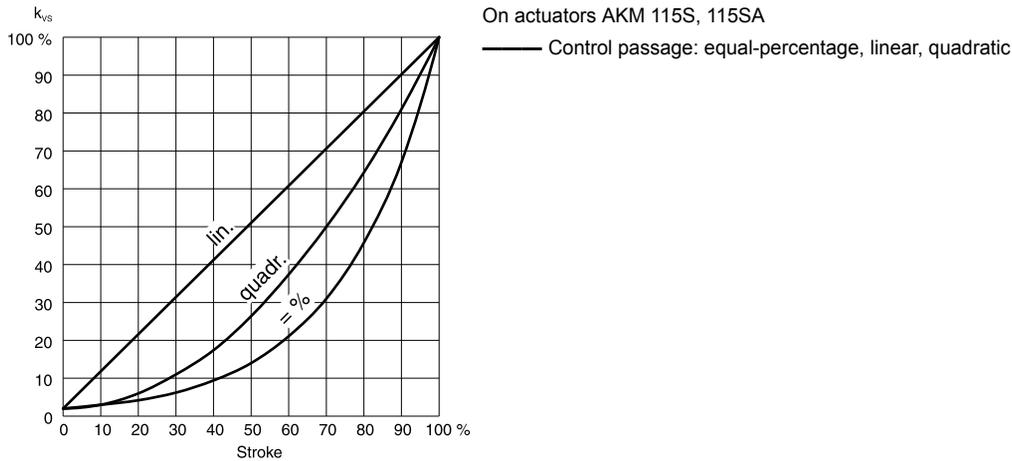
$\Delta p_v$ : Maximum admissible pressure difference over the valve at every stroke position, limited by noise level and erosion. With this parameter, the valve is characterised as a flow element with specific hydraulic behaviour. Monitoring the cavitation and erosion along with the associated noise increases both the service life and the operational capacity.

$\Delta p_{max}$ : Maximum admissible pressure difference over the valve at which the actuator can reliably open and close the valve. The following are considered: Static pressure and flow effects. This value ensures trouble-free stroke movement and tightness. The value  $\Delta p_v$  of the valve is never exceeded.

**$\Delta p_s$ :** Maximum admissible pressure difference over the valve in the event of a malfunction (e.g. power failure, excessive temperature or pressure, pipe break) at which the actuator can close the valve tightly and, if necessary, maintain the entire operating pressure against atmospheric pressure. Because this is a safety function with a rapid stroke movement,  $\Delta p_s$  can be greater than  $\Delta p_{max}$  or  $\Delta p_v$ . The flow disturbing effects that arise here are quickly passed through. They are of secondary importance with this method of operation. For 3-way valves, the values only apply to the control passage.

**$\Delta p_{stat}$ :** Line pressure behind the valve. This essentially corresponds to the idle pressure when the pump is switched off, caused for example by the fluid level in the system, increased pressure due to pressure tanks or steam pressure. For valves that close with pressure, the static pressure plus the pump pressure are used.

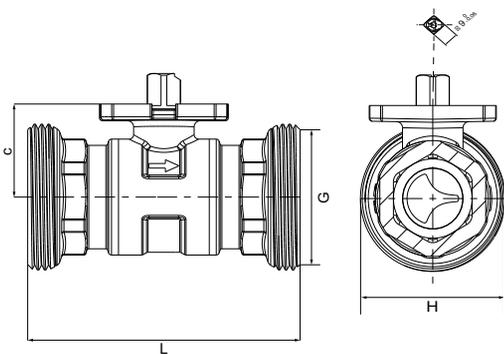
**Characteristic for control passage for actuators with positioner**



**Disposal**

When disposing of the product, observe the currently applicable local laws. More information on materials can be found in the Declaration on materials and the environment for this product.

**Dimension drawing**



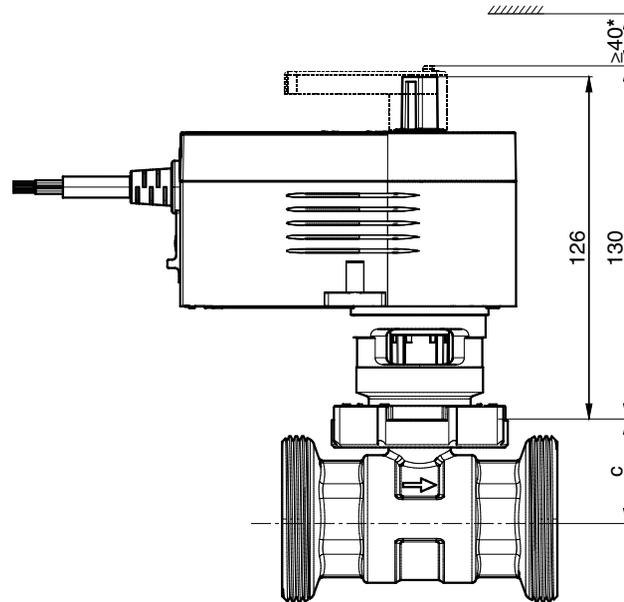
DN	c (mm)	G (inch)	L (mm)	H (mm)
15	27.6	G 1" B	87	33.25
20	27.6	G 1¼" B	89.4	41.9
25	30.5	G 1½" B	90	47.8
32	34.3	G 2" B	100	59.6
40	39.8	G 2¼" B	116.2	65.6
50	52.8	G 3¼" B	124.8	81.4

### Combinations

*i* All dimensions in mm.

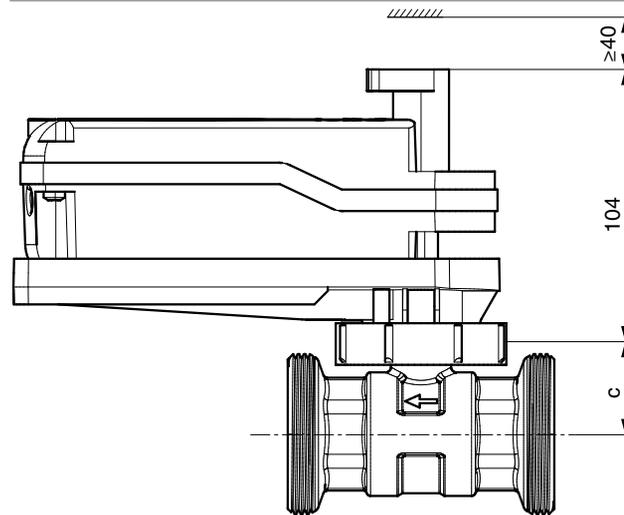
*i* For dimension *c*, see table above.

AKM 105, 115(S), 115SA<sup>2)</sup>



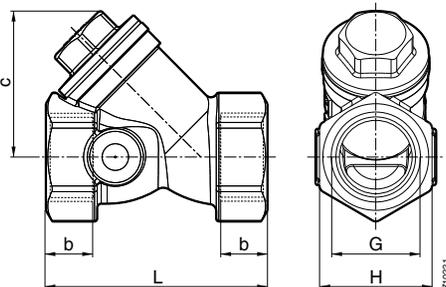
\*) with auxiliary change-over contacts 0510480001 or 0510480002:  $\geq 72$  mm

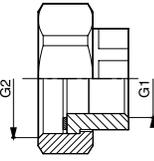
AKF 112, 113(S)



<sup>2)</sup> Observe length of AKM 115SA (see PDS 53.100)

Accessories

05603320**	DN	b (mm)	c (mm)	G (inch) ISO 228-1	L (mm)	H (mm)
	15	12	38	G ½	54	27
	20	15	43	G ¾	67	34
	25	16	53	G 1	79	41
	32	17	64	G 1¼	98	51
	40	18	70	G 1½	106	57
	50	20	85	G 2	122	69

03619510**	DN	G1 (inch) (ISO 228-1)	G2 (inch) (ISO 228-1)
	15	Rp ½	G 1
	20	Rp ¾	G 1¼
	25	Rp 1	G 1½
	32	Rp 1¼	G 2
	40	Rp 1½	G 2¼
	50	Rp 2	G 2¾

All dimensions in mm.

0510420001	0510240011
