

## Maintenance instruction for Ramén Sector Valve type KS / KSP

### Function

Ramén Ball Sector Valve is made from a half ball, a ball sector, which is journal led in a valve body via two shafts. One part of the ball sector sphere is used for shut-off. The other part of the sphere has a hole with a diameter which is about 80% of the nominal valve size. The ball sector is turned 90° from fully open to fully close. Some smaller valve sizes have a more reduced orifice and operation angle as follows; DN40/32 (70°), DN40/25 (60°), DN25/15 (65°), DN25/5 (60°), DN25/A-K (72°).

### Identification of valve

Valve size and material combination can be identified by marking code on the valve body according to the following example:

<b>PN 16</b>	= Pressure class PN
<b>→</b>	= standard flow direction
<b>KS</b>	= Type
<b>DN 100</b>	= Valve size DN
<b>1</b>	= Material combination as per below table
<b>SS 2343</b>	= Material in body

### Check of valve size

The valve size can be checked by measuring the outlet port diameter which is the same as the valve size. The inlet flow bore diameter is always reduced to about 80% of the outlet port diameter. Sizes DN25 and 40 may be further reduced.

**Valve material codes**

The valve body has a material code stamped in per following table.

Material code for type KS/KSP					
Code number	1	1A	1B	1C	1E
<b>Body (Item 1)</b>	SS2343 (CF8M)	SS2343 (CF8M)	SS2343 (CF8M)	SS2343 (CF8M)	SS2343 (CF8M)
<b>Shafts (Item 5+6)</b>	SS2324 (AISI 329)	SS2324 (AISI 329)	SS2324 (AISI 329)	SS2324 (AISI 329)	SS2324 (AISI 329)
<b>Ball Sector (Item 3)</b>	SS2343 (CF8M)	SS2343 (CF8M) + Hard chrome	SS2343 (CF8M) + Hard chrome	SS2343 (CF8M) + Hard chrome	SS2343 (CF8M) + Hard chrome
<b>Seat holding ring (Item 2)</b>	SS2343 (AISI 316/316L)	SS2343 (AISI 316/316L)	SS2343 (AISI 316/316L)	SS2343 (AISI 316/316L) + Hard chrome	SS2343 (AISI 316/316L) + Hard chrome
<b>Seat ring (Item 10)</b>	Carbon/graphite filled PTFE	Carbon/graphite filled PTFE	SS2343 (AISI 316/316L) + Stellite	SS2343 (AISI 316/316L) + Stellite	SS2343 (AISI 316/316L) + Stellite deep execution
<b>Shaft bearing (item 9)</b>	Standard= modified TFE (LR) Special= SST/PTFE compound (MP)				
<b>Shaft sealing type KS o-ring (Item 13+14)</b>	Viton	Viton	Viton	Viton	Viton
<b>Shaft sealing type KSP, stuffing box (Item 13)</b>	PTFE	PTFE	PTFE	PTFE	PTFE
<b>Seat back-up o-ring (Item 15)</b>	Viton	Viton	Viton	Viton	Viton
<b>Seat back-up spring &amp; seal ring (Item 15A+15B)</b>	SS2324/PTFE (AISI329/PTFE)	SS2324/PTFE (AISI329/PTFE)	SS2324/PTFE (AISI329/PTFE)	SS2324/PTFE (AISI329/PTFE)	SS2324/PTFE (AISI329/PTFE)
<b>Sealing between inlet cover ring and body (Item 16)</b>	Viton	Viton	Viton	Viton	Viton
<b>Valves supplied with other o-ring material than Viton has material code suffix:</b>	(EP)=EPDM (KKT/KTT)= Kalrez/Vitoflon (FS)=Fluor Silicon (AF)=Aflas (X)= Other quality				

UJ-E-KS

## Pressure and temperature limits

Temperature related max working pressure in bar for material SS-2343 (CF8M):

PN	-40 <sup>0</sup> C	+20 <sup>0</sup> C	+50 <sup>0</sup> C	+75 <sup>0</sup> C	+100 <sup>0</sup> C	+150 <sup>0</sup> C	+200 <sup>0</sup> C	+250 <sup>0</sup> C
PN10	10	10	9	8,5	8	7,5	7	7
PN16	16	16	14,5	13,5	13	12	11,5	11
PN25	25	25	23	21,5	20,5	19	18	17,5
PN40	40	40	37	35	33	31	29	28

Temperature limits for seat- and sealing material.

Material	O-ring seals (Type KS)					Seat ring (Type KS / KSP)		Shaft Sealing (type KSP)	
	Viton	Viton GLT	EPDM peroxide		Kalrez	Vitoflon	PTFE carbon/graphite filled	Stellited SST	PTFE braid
Min temperature	-10 <sup>0</sup> C	-40 <sup>0</sup> C	-20 <sup>0</sup> C		-10 <sup>0</sup> C	-10 <sup>0</sup> C	-40 <sup>0</sup> C	-40 <sup>0</sup> C	-40 <sup>0</sup> C
Max temperature	+170 <sup>0</sup> C	+170 <sup>0</sup> C	+120 <sup>0</sup> C (+140 <sup>0</sup> C)		+200 <sup>0</sup> C (+250 <sup>0</sup> C) <sup>1)</sup>	+200 <sup>0</sup> C	+170 <sup>0</sup> C	+200 <sup>0</sup> C (+250 <sup>0</sup> C) <sup>1)</sup>	+250 <sup>0</sup> C

1) with shaft bearing material MP (option)

Temperature limits for shaft bearing material

Material	Standard (type LR)	Option (type MP)
Min temperature	-40 <sup>0</sup> C	-40 <sup>0</sup> C
Max temperature	+200 <sup>0</sup> C	+250 <sup>0</sup> C

### Attention!

The temperature limits for sealing material varies depending on which type of media and pressure it will be exposed to. Contact the manufacturer of sealing material or your valve supplier in all cases of hesitation.

## Valve actuator

The valve is normally equipped with an actuator. Depending on the application it can be a hand lever or a remotely controlled pneumatic or electric actuator. The actuator may have limit switches (on-off application) or positioner (continuous control).

## Installation

**This product shall only be inspected, installed and used by a person who has relevant training or experience. If any questions or hesitation, contact your valve supplier or Ramén Trading AB.**

If the valve shall be equipped with actuator this shall be done before installation in the pipe line. Separate instruction is supplied on request.

Before installation of the valve, check that the valve data is in conformity with actual type of service with reference to media, pressure and temperature.

**If the valve shall be used as shut-off valve against atmosphere at the end of the pipe, where possible leakage can cause person injury or property damage, there are special limits for max working pressure and, if necessary, demands on blocking the actuator. Contact your valve supplier.**

Piping shall be thoroughly cleaned. Check that the pipe flanges are parallel and that the piping system can not be subject to uncontrolled forces caused by pressure peaks, or pipe forces caused by variations in temperature.

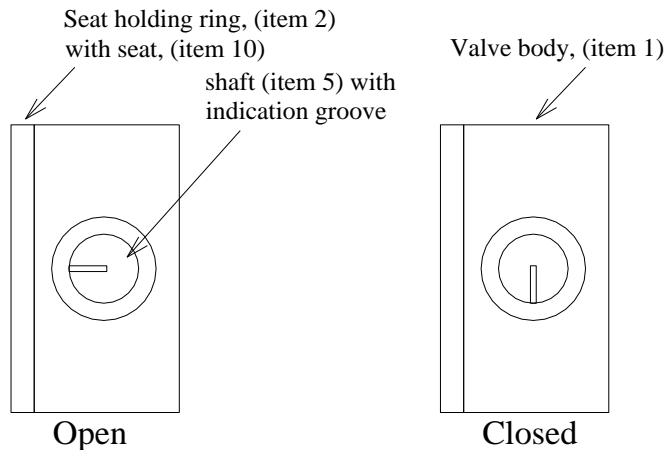
### **IMPORTANT!**

**Install the valve in such position that injury on person, or damage on property, is avoided in case of leakage from sealing or flange joints. Also, make sure that, in case of leakage, inflammable media do not come in contact with electrical components or hot surfaces which can cause fire or damage on property.**

The valve shall be operated into fully open position after installation and the pipe system be properly flushed before put into service.

## Valve position indication

The actual position of the ball sector can be defined on the lower shaft end, opposite to the actuator:



## Maintenance

Ramén Ball Sector valve requires no lubrication and a minimum of maintenance. If any part of the valve should become damaged it can be replaced by a spare part. Spare parts are obtained from the valve distributor. Any spare parts order must indicate valve type (KS), size (DN), material combination and item number according to the spare parts list.

### Design change

Valves type KS, DN40-300, which from the year 1997 are delivered with a number 2 stamped before or after the type (2KS or KS2) are supplied with a locking ring, pos 4A on the inside end of the shaft (DN40-50) or on the bearing sleeve (DN80-300).

## Disassembly

### DN 25 (1")

- Loosen and remove screws (11) and inlet cover ring (2).
- Lift out seat ring (10) carefully from its groove using a pointed tool and the O-rings (15 and 16).
- Loosen the nut (12) and pull out fastening flange (1A).
- Push bearing sleeve (4) into the valve and remove split ring (4A).
- Pull bearing sleeve (4) out from the valve body (1), and shaft with ball sector (3) out from the bearing sleeve (4).
- Remove Rulon bearing (9) from the shaft (3).
- Remove O-rings (13 and 14). Be careful not to damage sliding ring (13A). See "Reassembly"
- Remove the ball sector (3) from the valve body (1).

**DN 40-50 (1½"-2")**

- a) Loosen screws (11) and inlet cover ring (2)
- b) Lift out seat ring (10) carefully from its groove using a pointed tool and the O-rings (15 och 16).
- c) Lift out seat support ring (7).
- d) Loosen locking rings (18) and washer (17) at both trunnion shaft ends.
- e) Push the ball sector slightly so that the locking ring, 4A, can be removed using a small screw driver. Pull out trunnion shaft (6) by fastening it in a jaw vice and then knocking on the actuator flange on the valve body.
- f) Push out trunnion shaft (5) by means of a rod inserted through the shaft hole.
- g) Remove Rulon bearing (9) from the shafts.
- h) Remove O-rings (13 and 14). Be careful not to damage sliding ring (13A). See "Reassembly"

**DN 80-250 (3"-10")**

- a) Loosen screws (11) and inlet cover ring (2)
- b) Lift out seat ring (10) carefully from its groove using a pointed tool and the O-rings (15 and 16).
- c) Lift out seat support ring (7).
- d) Loosen locking rings (12) enough to loosen the bearing sleeves (4). Push the ball sector slightly so that the locking ring, 4A, can be removed using a small screw driver.
- e) Pull out the bearing sleeves (4) from the shafts and out of the valve body, and/or trunnion shaft (6) by fastening it in a jaw vice and then knocking on the actuator flange on the valve body.
- f) Push out trunnion shaft (5) and eventually the sleeve (4) by means of a rod inserted through the shaft hole.
- g) Remove Rulon bearing (9) from the shafts.
- h) Remove O-rings (13 and 14). Be careful not to damage sliding ring (13A). See "Reassembly"

**DN 300 (12")**

- a) Loosen nuts (21), remove bolts (20) and clamping rings (19)
- b) Remove inlet cover ring (2)
- c) Lift out seat support ring (7).
- d) Lift out seat ring (10) carefully from its groove using a pointed tool and the O-rings (15 and 16).
- e) Loosen screws (12) enough to loosen the bearing sleeves (4).
- f) Pull the bearing (4) out from the shafts and out of the body or/and knock on the shaft (6) and eventually on the bearing.
- g) Push out the shaft (5) and eventually the bearing by means of a rod inserted through the shaft hole.
- h) Remove O-rings (13 and 14). Be careful not to damage sliding ring (13A). See "Reassembly".

## Reassembly

Proceed in reverse order. O-rings (13, 14, 15 and 16) shall be lubricated with suitable grease before reassembling. Please note "Important when assembling" below. If the o-rings show sign of wear or other damage, check if the most appropriate o-ring material has been used. Check the sliding ring (13A) replace if necessary. The sliding ring is not necessary for the valve function but will increase the efficiency and life of the shaft seal. Proper mounting of the sliding ring may be done only with the appropriate tool as shown in fig 2.

### Important when reassembling:

#### DN25 (1")

- a) Check carefully that the groove for the o-rings (13 and 14) is clean and free from damage. Also check the conical entrance on the bearing sleeve and lower shaft hole on the body.
- b) Apply silicon grease generously on the O-rings before assembling. Mount the sliding rings (13A), and the ball sector (3) with tool shown in fig 2.
- c) Mount o-ring (13) on the **drive shaft** but **not** on the lower shaft. Insert the drive shaft into the big inlet hole in the body and then into the big shaft hole so that the ball sector now is in the body.
- d) Mount O-ring (14) on bearing sleeve (4) and roll up the bearing (9) on its place in the bearing sleeve. Carefully mount the bearing sleeve on the drive shaft taking notice that the bearing (9) and O-ring (13) not is damaged.
- e) Mount the split ring (4A) in its groove on the bearing sleeve(4) then push the bearing sleeve out from the body until the split ring meets the valve body. Hold the bearing sleeve in this position and push the lower shaft through its hole in the body as much as it needs to mount the O-ring (13) from the outside of the valve body. Apply lubricant generously.
- f) **With greatest care**, push the shaft and O-ring into its place in the valve body using a proper tool, f. ex. the sliding ring tool, see fig 2. Use the tool to push the O-ring, alternately pull the shaft, until the O-ring reaches its sealing position. This position is reached when the ball sector sphere are in the middle of the body.
- g) Mount O-ring (15) and seat (10) in the holding ring (2) and O-ring (16). Turn the ball sector clockwise into closed position.
- h) Mount the seat holding ring with screws (11). Check that the seat holding ring is in full contact with body. Eventually the holding ring can be pressed to the body with help of a jaw vice with soft grips.
- i) Turn the bearing sleeve so that the hole for the stop screw (1B) pointing in right direction, then push the flange (1A) into position. Mount stop screw (1B) carefully checking that it goes fully into the hole in the bearing sleeve.
- j) Mount the nut (12) slightly with fingers. Fasten the flange (1A) into a vice and tighten nut (12) hard with a box-spanner.
- k) Turn ball sector between open and closed a few times to ensure that the necessary torque is normal, approx 5 Nm, during the hole stroke.

(7/10)



**DN 40-50 (1½"-2"), reassembly is done in reverse order.**

Sliding ring (13A) can only be mounted with the tool shown in fig 2.

When O-ring (13) has been placed in its groove on the shaft (5) and drive shaft (6) and then pushed into the body great care must be taken not to damage the o-ring. Fig. 3 shows a suitable method and dimensions on a tool that will protect the O-ring (13) and Rulon bearing (9) when assembling.

Check that the locking ring (4A) is undamaged and kept in some tension in its groove after reassembly. Change ring if necessary.

**DN 80 - 300 (3"-12"), reassembly is done in reverse order.**

Sliding ring (13A) can only be mounted with the tool shown in fig 2.

Carefully push the bearing sleeve (4) with the O-ring (14). When the O-ring passes the drilled hole for the stop screw (12) it might be pressed into the hole with risk for damage. Check that the hole is free from sharp edges or burrs. When the O-ring passes the hole it can be pushed back from out side with a blunt end pin.

Check that the locking ring (4A) is undamaged and kept in some tension in its groove after reassembly. Change ring if necessary.

### After reassembly

Pressure test the valve with air from the valves outlet side and with the valve closed. The valve immersed in water or with leakage spray shall be bubble tight over shaft seals and seat. I small bubbles can be detected around the shafts it can be enough to actuate the valve a few times allowing the O-rings to find its correct position. If the valve still leaks the o-ring has been damaged and must be changed. Valves with PTFE-seat shall be bubble tight in both directions. Valves with stellited seat will never be bubble tight. These valves can be tested with water. Max leakage for a new valve is 0,01% of the valves  $C_v/K_v$ s-value.

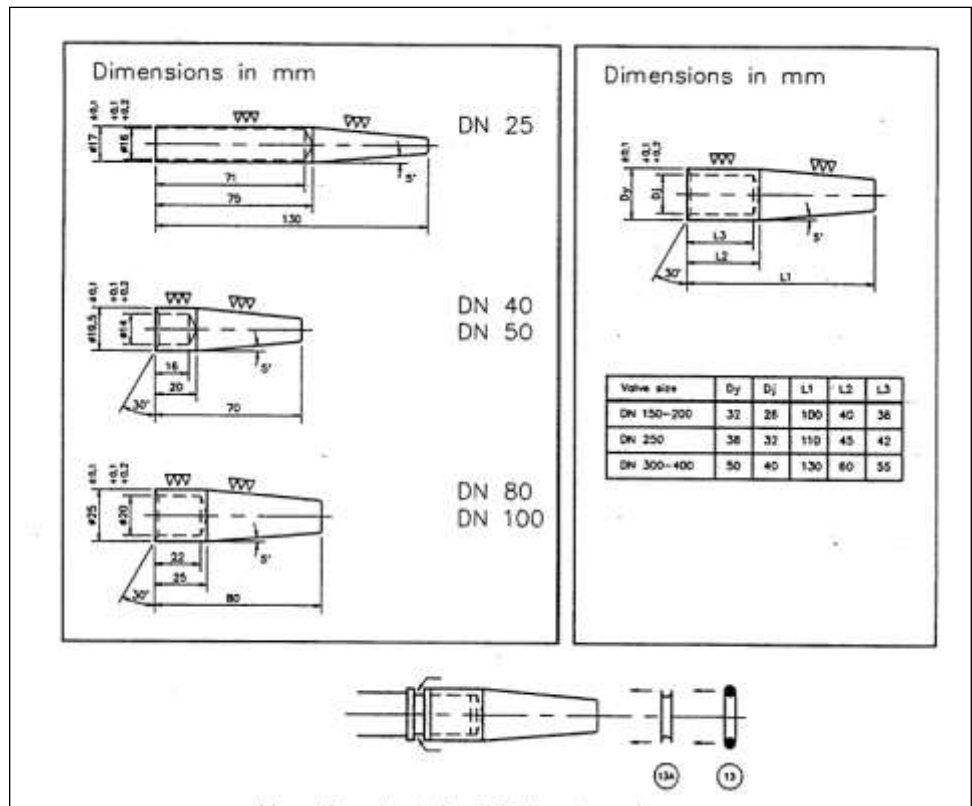
### Mounting actuator on the valve

**IMPORTANT!**

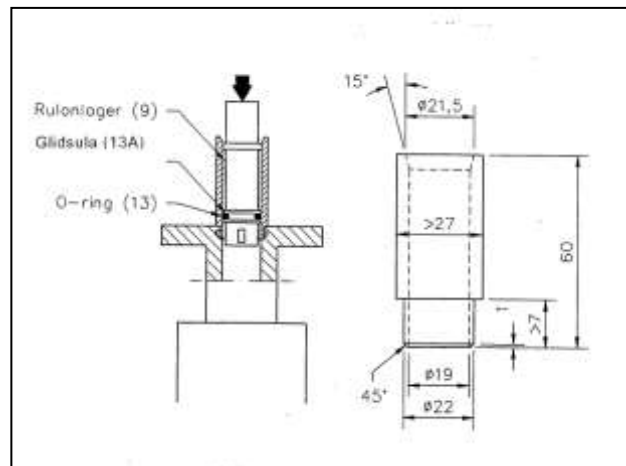
- a) Avoid to axially move the ball sector in the valve body. Never hammer on the drive shaft end when mounting the actuator.
- b) The ball sector must not be turned more than 90° necessary to operate the valve from closed to open position. If the ball sector accidentally has been turned out of the range, the screws on the inlet cover must be loosened and the contact pressure between ball sector and seat ring reduced to zero before the ball sector is returned to right position.
- c) When the actuator is properly mounted and adjusted it shall turn the ball sector 90° between open and closed. Closed position of the ball sector sealing surface shall for optimum tightness be such that the seat ring is located in the middle of the sealing surface as indicated in fig. 4.

Separate instruction for mounting of actuator can be required from Ramén or your valve distributor.





**Fig. 2**  
Tool for mounting  
gliding ring and O-ring.



**Fig 3**  
Tool for mounting  
shaft and drive shaft.

**Fig. 4**  
Ball sector position when  
valve is closed.

