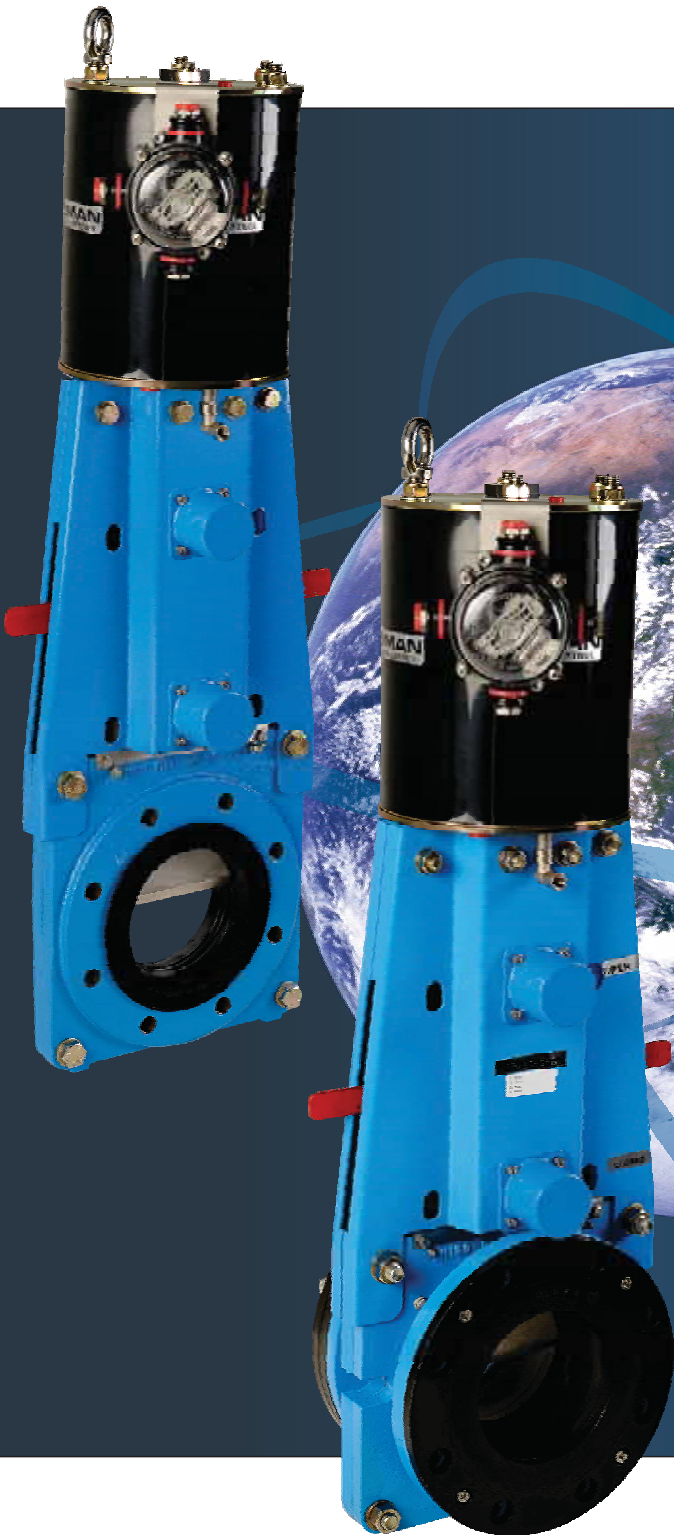




World Class Performance
in Abrasive, Scaling and
Corrosive Slurries, Sludge,
Liquids, and Bulk Solids



RF VALVE SKG® F & W - IOM MANUAL
Installation, Operation & Maintenance



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PROLOGUE

This document offers simple guidelines in maximising the operational life of all RF VALVE SKG branded knife gate valves.

- SKG F: Slurry Knife Gate, Flanged
- SKG W: Slurry Knife Gate, Wafer

The purpose of this manual is to:

- Outline storage, transportation and handling procedures
- Outline installation procedures
- Outline operational procedures
- Outline maintenance procedures



Specifications

RF-SKG F (Flanged)

The heavy duty slurry knife gate valve shall be a flanged, bi-directional valve with a packingless design. The full port bore shall be formed by two heavy duty elastomer sleeves, one on either side of the gate. Each sleeve shall have a J-ring design stiffener to maintain the shape of the sleeve. Upon closing, the gate will progressively separate the sleeves and once fully closed, will form a bubble tight seal with the upstream sleeve. The yoke shall consist of two yoke plates that fully enclose the gate, spindle and clevis to protect these components from slurry splatter. The yoke design will allow for easy mounting of proximity or limit switches. Steel proximity switch covers must be provided to prevent damage during transport and operation. Provision must be made for lockouts in the open and closed position with open and closed indicators. The top bracket must accept manual, pneumatic or electric actuation for easy conversion in the field.

RF-SKG W (Wafer)

The heavy duty slurry knife gate valve shall be a wafer style, bi-directional valve with a packingless design. The full port bore shall be formed by two heavy duty elastomer sleeves, one on either side of the gate. The roundness of the sleeve shall be maintained by an embedded stiffener ring near the sealing face and a steel disc on the mating face. Upon closing, the gate will progressively separate the sleeves and once fully closed, will form a bubble tight seal with the upstream sleeve. The yoke shall consist of two yoke plates that fully enclose the gate, spindle and clevis to protect these components from slurry splatter. The yoke design will allow for easy mounting of proximity or limit switches. Steel proximity switch covers must be provided to prevent damage during transport and operation. Provision must be made for lockouts in the open and closed position with open and closed indicators. The top bracket must accept manual, pneumatic or electric actuation for easy conversion in the field.



Storage Procedures

Valves stored for long periods of time need to comply with storage procedures to ensure their effectiveness when installed, the following procedures should be complied with:

1. Indoor, dry, vented storage is recommended
2. SKG type valves should be stored with their gates in the open position, alleviating stresses on their sleeves

Please note that if “spring to extend” or “spring to extract” cylinders are mounted to any valve the gate will be in the position where the cylinder spring is fully extended

3. Equipment should not be exposed to temperature and humidity extremes
4. Equipment should not be exposed to direct sunlight and ozone generating equipment
5. Equipment should not be exposed to excessive moisture
6. Equipment should not be exposed to excessive vibration
7. Ensure all pneumatic and hydraulic cylinders have their supply ports plugged to prevent any contamination
8. Protect all rubber components from heat and exposure to ozone
9. In cold conditions, keep equipment dry
10. Do not store heavy objects on the valve equipment
11. For extended storage “hardboard” covers should be attached to the valve flanges
12. When accessories are mounted to valves, the respective storage instructions of the manufacturer shall be observed as a priority

Transportation and Handling Procedures

Valves to be transported in solid crates adapted to the valve sizes being transported. Contents of the crates should be kept in place by means of foam packing material. Accessories fitted to the valves should be protected using suitable protection material.

When handling equipment please ensure correct protective equipment is used for one self and for the handling of valves.



Installation Procedures

Installation procedures are slightly different for each of the RF-SKG branded knife gate valves, therefore each range will be addressed individually

Some general guidelines relevant to all ranges include:

- Prior to installation, the adjoining pipe work must be checked for alignment. Misaligned pipework must be corrected before installation to avoid tension, leaks or even cracking of valve bodies
- RF-SKG valves have been designed to be used with full flat faces metal flanges
- All parts, particular the gate and stem must be free from any dust and dirt before installation
- Valves with exposed rubber-lining need to have precautionary measures exercised while cutting or welding near the valve
- Valves must be installed to grant access to any peripheral accessories such as proximity switches and valve mounted solenoid valves
- Valves should ideally be installed in the vertical position, any valve which requires an installation other than vertical must consider supporting the actuator adequately
- Never use a valve to support pipe work, proper pipe supports should be placed on either side of the valve
- When tightening pipe flange bolts use a good cross bolting sequence to ensure equal loading of the flanges. Refer to Table 2: Flange bolt tightening torques
- Valves being fitted into existing pipe work will require a gap of the face to face value of the valve plus a minimum of 10mm
- Once the valve is installed cycle the valve once to ensure it operates correctly. Also ensure any valve accessories are in proper adjustment
- All RF-SKG knife gate valves are bi-directional, therefore suitable for process flow in either direction. The addition of a deflector cone will make the valve uni-directional
- Pneumatically and electrically actuated valves should never be “instantly” closed as this could cause “water hammer” which will cause severe damage to both the valve and pipe work. The recommended speed is 2-3 seconds per inch of travel
- If site requires additional painting to valves ensure that the stem, piston rod, gate, seals and accessories do not get painted.

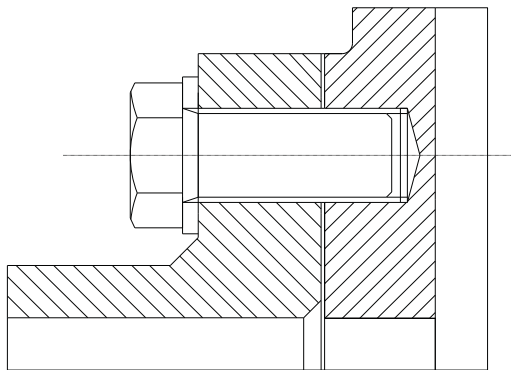


When installing valves please take note of the flange bolting guidelines for:

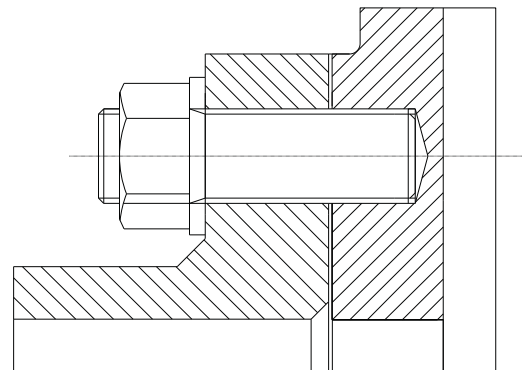
- Tapped blind holes
- Through holes on flanged valves
- Through holes on wafer valves

Flange bolting guide lines: Tapped blind holes

Using hex bolts: make sure the bolt does not bottom out

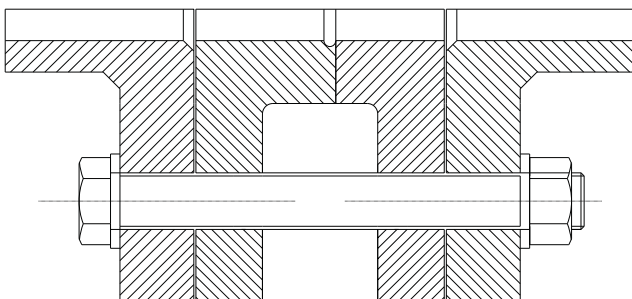


Using engineering studs: This is the preferred method

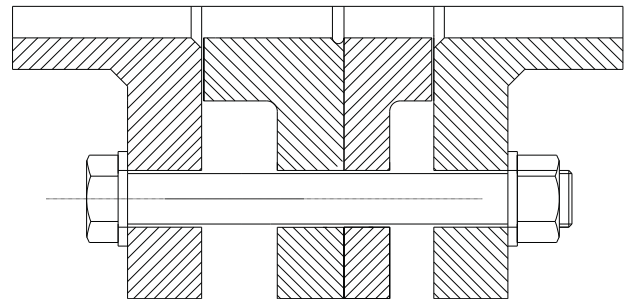


Flange bolting guide lines: Through holes, Flanged and Wafer design

Flanged



Wafer





Additional Product Specific Installation Procedures

RF-SKG F (Flanged)

- Valves should not be installed where its discharge could impact on electrical equipment or pedestrian access
- An optional drain plate is available to divert the discharge if required
- The valve gate should always be positioned to full open before installing the valve and tightening the pipe flanges
- Valve HAS counter flanges and therefore does not require an engaging pipe flange on both ends
- When the valve is installed horizontally into a vertical pipeline, flushing is recommended to get rid of idle media trapped in the valve body
- Drain plates can be fitted to the open end of the valve to eliminate discharge during cycling. Drilled and tapped holes are supplied in the valve body, the actual drain plate must be ordered as an optional extra
- When drain plates are fitted to the valve flushing must be introduced on site to eliminate media build up in the valve body which will result in jamming
- Refer to Table 1: Flange bolting lengths

RF-SKG W (Wafer)

- Valves should not be installed where its discharge could impact on electrical equipment or pedestrian access
- An optional drain plate is available to divert the discharge if required
- The valve gate should always be positioned to full open before installing the valve and tightening the pipe flanges
- Valve DOES NOT have counter flanges and therefore does require an engaging pipe flange on both ends
- When the valve is installed horizontally into a vertical pipeline, flushing is recommended to get rid of idle media trapped in the valve body
- Drain plates can be fitted to the open end of the valve to eliminate discharge during cycling. Drilled and tapped holes are supplied in the valve body, the actual drain plate must be ordered as an optional extra
- When drain plates are fitted to the valve flushing must be introduced on site to eliminate media build up in the valve body which will result in jamming
- Refer to Table 1: Flange bolting lengths
- Refer to Table 2: Flange bolt tightening torques



TABLE 1: FLANGE BOLTING LENGTHS

SIZE	SKG W				SKG F		
	BOLT LENGTH	ENGINEERING STUDS	WASHERS QTY	NUTS QTY	BOLT LENGTH	WASHERS QTY	NUTS QTY
DN50		5/8" x 2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)			
DN65		5/8" x 2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)			
DN80		5/8" x 2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)	5/8"x2.75" (16 OFF)	5/8" (16 OFF)	
DN100		5/8" x 2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)	5/8"x2.75" (16 OFF)	5/8" (16 OFF)	
DN125		3/4" x 2" (16 OFF)	3/4" (16 OFF)	3/4" (16 OFF)			
DN150		3/4" x 2.16" (16 OFF)	3/4" (16 OFF)	3/4" (16 OFF)	3/4"x2.75" (16 OFF)	3/4" (16 OFF)	
DN200		3/4" x 2.55" (16 OFF)	3/4" (16 OFF)	3/4" (16 OFF)	3/4"x2.75" (16 OFF)	3/4" (16 OFF)	
DN250		7/8" x 2.75" (24 OFF)	7/8" (24 OFF)	7/8" (24 OFF)	7/8"x2.95" (24 OFF)	7/8" (16 OFF)	
DN300		7/8" x 2.95" (24 OFF)	7/8" (24 OFF)	7/8" (24 OFF)	7/8"x2.95" (24 OFF)	7/8" (24 OFF)	
DN350		1" x 2.95" (24 OFF)	1" (24 OFF)	1" (24 OFF)	1"x3.93" (24 OFF)	1" (24 OFF)	
DN400		1" x 3.34" (24 OFF)	1" (32 OFF)	1" (32 OFF)	1"x3.93" (32 OFF)	1" (32 OFF)	
DN450	1 1/8x7.09" (4 OFF)	1 1/8"x3.35"(24 OFF)	1 1/8" (32 OFF)	1 1/8" (28 OFF)	1 1/8"x4.43" (32 OFF)	1 1/8" (32 OFF)	
DN500	1 1/8x8.27" (4 OFF)	1 1/8"x 4" (32 OFF)	1 1/8" (40 OFF)	1 1/8" (36 OFF)	1 1/8"x4.43" (40 OFF)	1 1/8" (40 OFF)	
DN600	1 1/4x8.27" (4 OFF)	1 1/4"x 4" (32 OFF)	1 1/4" (40 OFF)	1 1/4" (36 OFF)	1 1/4"x4.43" (40 OFF)	1 1/4" (40 OFF)	



TABLE 2: Flange Bolt Tightening Torques

VALVE SIZE DN	RECOMMENDED TIGHTENING TORQUE N/M
50	50
65	50
80	50
100	50
125	94
150	94
200	94
250	153
300	153
350	229
400	229
450	323
500	323
600	323

Operating Instructions

- Always check that the valve is compliant to piping, flange and pressure specifications
- Handwheel operated valves must only be operated by hand, DO NOT use a bar or similar tool to create leverage
- Always ensure that the valve is fully closed or fully open, except when designed for modulation
- Pneumatically operated valves must be actuated with instrument air free from moisture
- Valves not operated for long periods of time should be greased and cycled every 3 months
- DO NOT operate any valve at pressures / temperatures higher than those recommended for



Maintenance Procedures

Maintenance procedures are slightly different to each of the RF-SKG branded knife gate valves, therefore each range will be addressed individually

Some general periodic maintenance guidelines, relevant to all ranges include:

- General maintenance checks should be conducted regularly, these checks should incorporate checking valve functionality and making sure that all sealing materials and members are lubricated sufficiently
- Recommended grease for rubber and seal components are silicon based
 - OKS S1110 SILICON GREASE
 - Dow # 111 silicon based lubricant
 - Rhone - Poulenc Rhodorsil 111
 - Dow 44
 - Dow 7
 - SilGlyde by AGS Company

DO NOT USE HYDROCARBON BASED LUBRICANTS

- Stem rods and piston rods shall be free of dirt and contamination and shall always be well lubricated, this should not be necessary more than twice annually unless the stem cover has been removed or the stem boot damaged, use a suitable mechanical grease
- On all actuated valves make sure the operating mechanism is isolated prior to any adjustments or maintenance being carried out



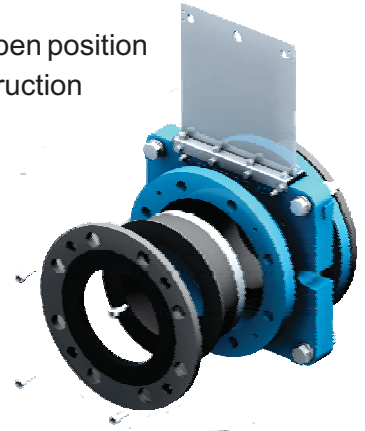
Additional Product Specific Maintenance Procedures

RF-SKG F (Flanged)

• Counter flange and sleeve removal

This operation may only be done with the valve removed from the line and in the open position

- Disconnect all accessories to the valve that are not part of the valve's construction (Air feeds, electrical and hydraulic connections etc)
- Remove the valve from the line
- Remove the allen cap screws securing the counterflange
- The counter flange and sleeves may then be removed



• Counter flange and sleeve replacement

- Thoroughly clean any residue slurry from the valve body
- Apply a liberal coating of the approved silicon grease to the body halves
- Coat the exterior of the sleeves with a thin coating of grease, this allows the sleeve to move freely in the body casting
- Replace the counter flange housing, coat the inner counter flange face with a smear of grease
- Replace the allen cap screws and tighten evenly

IT IS RECOMMENDED TO REPLACE BOTH SLEEVES

• Gate replacement

Ensure that the valve is in the open position

- Support the valve in the vertical position
- Remove sleeves and counter flanges from the valve as per above instructions
- Remove fitted proximity switches and protective covers
- Slacken the upper and lower bolts which secure the yoke plates by removing the nuts
- Carefully remove the "front" yoke plate and refit the lower yoke bolt nuts "finger tight"
- Loosen the rear yoke plate away from the valve body
- Remove the split pin retaining the clevis pin and then remove the clevis pin
- Remove the actuator
- The gate may then be removed from the body of the valve
- To replace with a new gate reverse the sequence of operation above



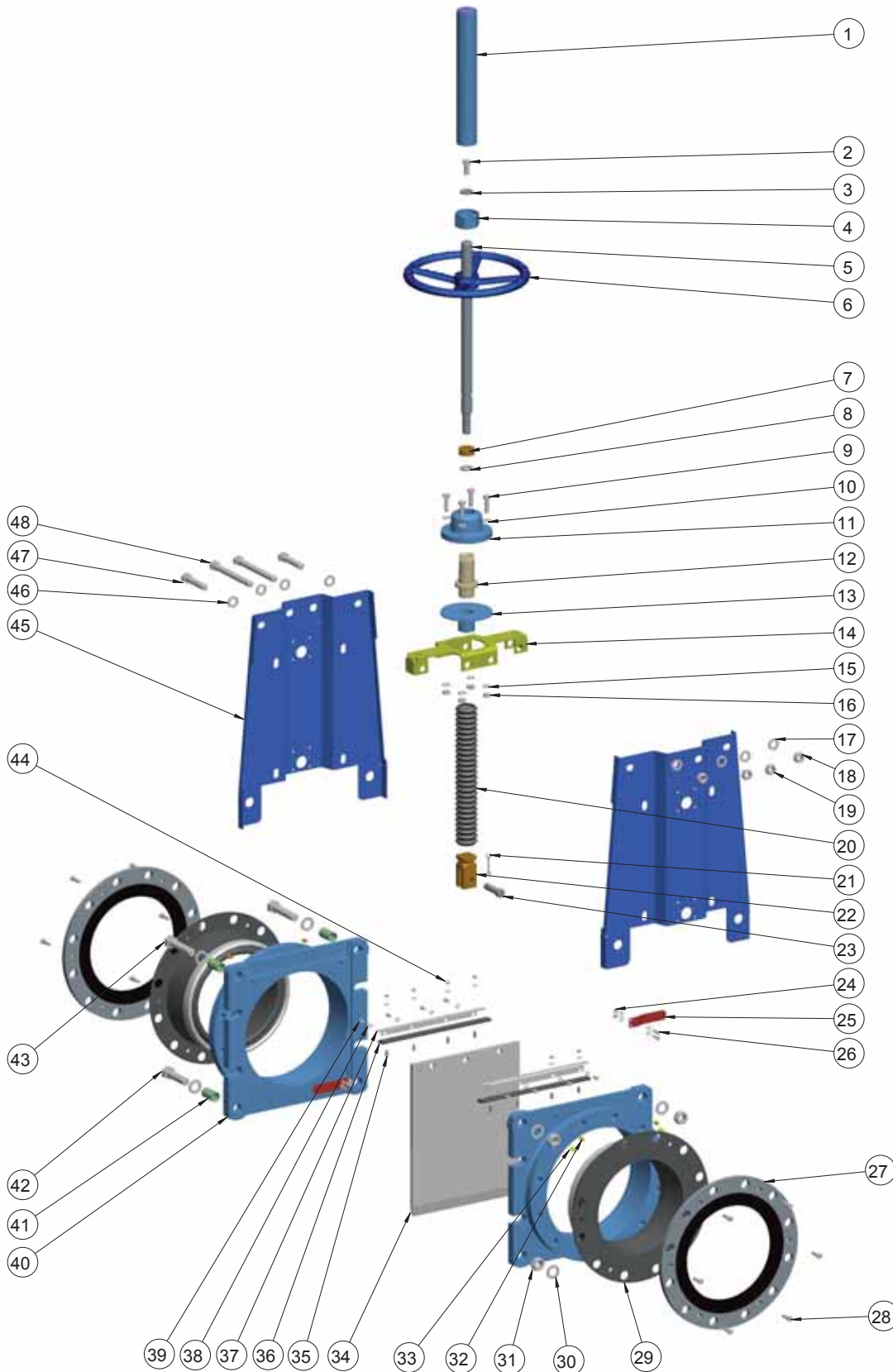
• Gate wiper replacement

- Remove the bolts holding the gate wiper in place
- Remove the assembled wiper unit
- Remove the bolts holding the HDPE wiper pad to the L frame
- Replace the HDPE wiper
- Fasten the bolts holding the HDPE wiper to the L frame
- Fit the assembled unit back to the body by fastening the bolts
- Do this from both sides



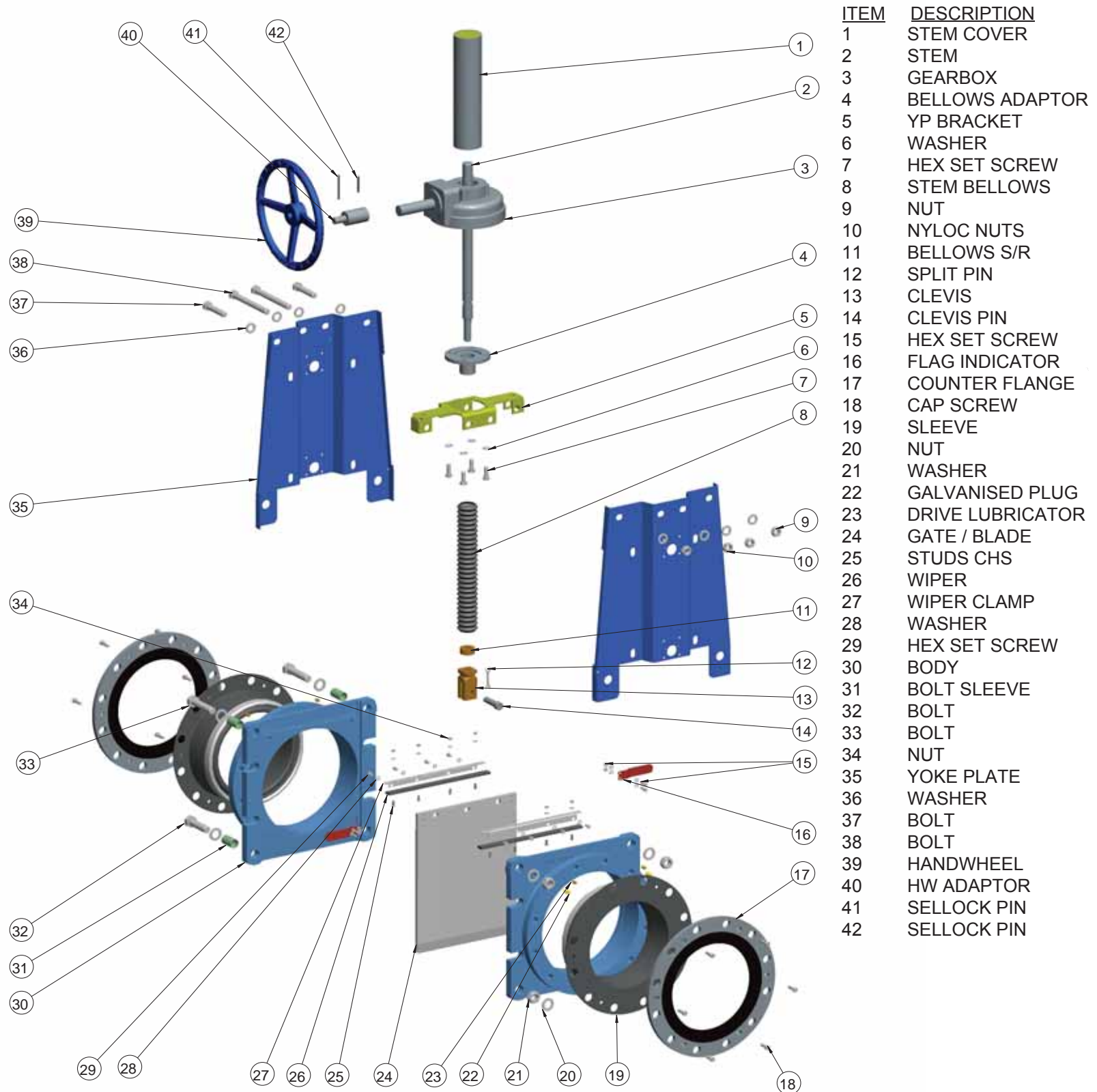


SKGF-M EXPLODED VIEW



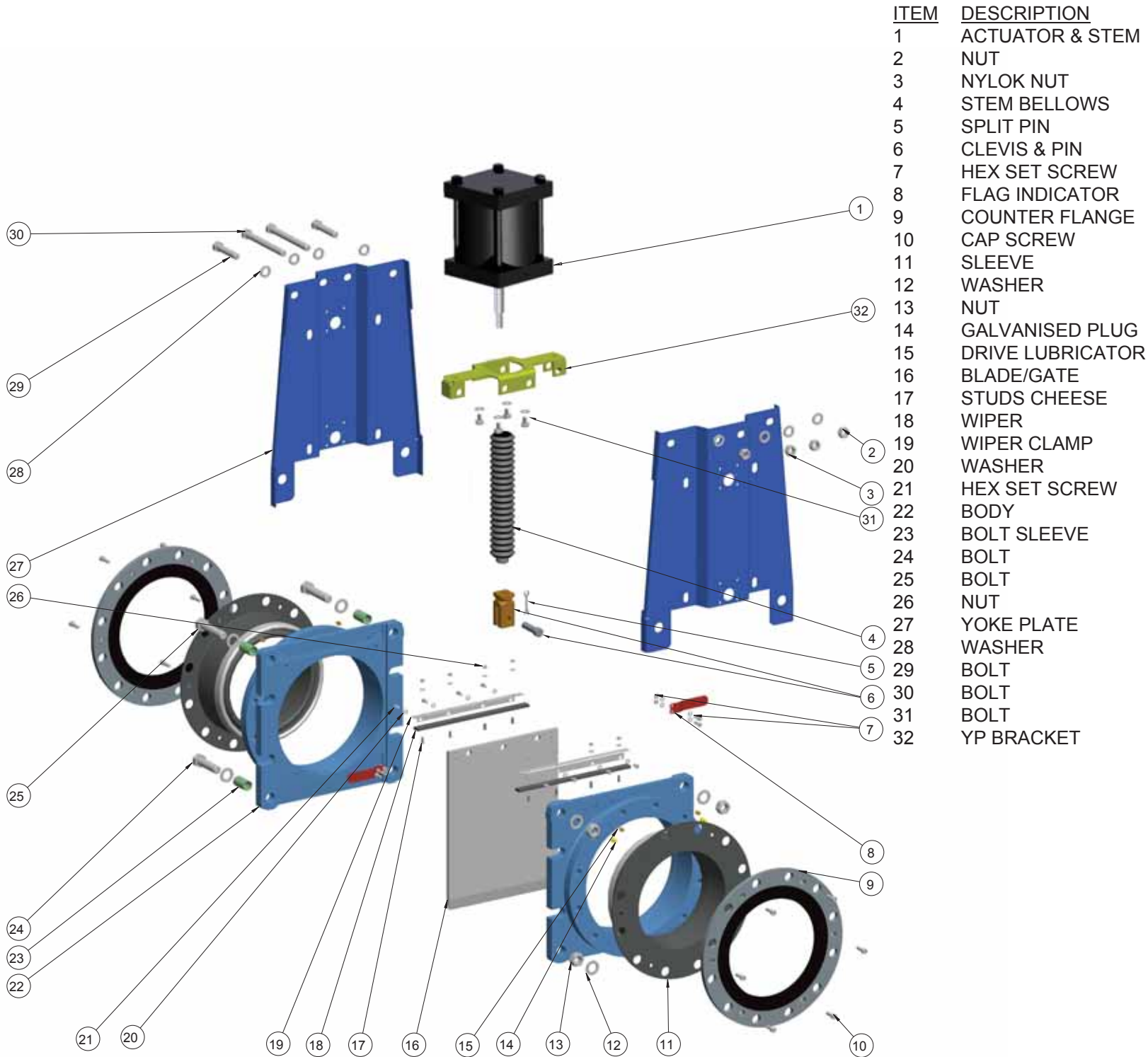
ITEM	DESCRIPTION
1	STEM COVER
2	BOLT
3	STEM WASHER
4	NUT FOR STEM COVERS
5	STEM
6	HANDWHEEL
7	BELLOWS STOP RING
8	NUT LOCK
9	BOLT
10	WASHER
11	THRUST HOUSING
12	THRUST NUT
13	BELLOW ADAPTOR
14	YOKE PLATE BRACKET
15	WASHER
16	NUT
17	WASHER
18	NUT
19	NYLOC NUTS
20	STEM BELLOWS
21	SPLIT PIN
22	CLEVIS
23	CLEVIS PIN
24	NUT
25	FLAG INDICATOR
26	HEX SET SCREW
27	COUNTER FLANGE
28	CAP SCREW
29	SLEEVE
30	WASHER
31	NUT
32	DRIVE LUBRICATOR
33	GALVANISED PLUG
34	GATE / BLADE
35	STUDS
36	WIPER
37	WIPER CLAMP
38	WASHER
39	HEX SET SCREW
40	BODY
41	BOLT SLEEVE
42	BOLT
43	BOLT
44	NUT
45	YOKE PLATE BRACKET
46	WASHER
47	BOLT
48	BOLT

SKGF-MG EXPLODED VIEW



ITEM	DESCRIPTION
1	STEM COVER
2	STEM
3	GEARBOX
4	BELLOWS ADAPTOR
5	YP BRACKET
6	WASHER
7	HEX SET SCREW
8	STEM BELLOWS
9	NUT
10	NYLOC NUTS
11	BELLOWS S/R
12	SPLIT PIN
13	CLEVIS
14	CLEVIS PIN
15	HEX SET SCREW
16	FLAG INDICATOR
17	COUNTER FLANGE
18	CAP SCREW
19	SLEEVE
20	NUT
21	WASHER
22	GALVANISED PLUG
23	DRIVE LUBRICATOR
24	GATE / BLADE
25	STUDS CHS
26	WIPER
27	WIPER CLAMP
28	WASHER
29	HEX SET SCREW
30	BODY
31	BOLT SLEEVE
32	BOLT
33	BOLT
34	NUT
35	YOKE PLATE
36	WASHER
37	BOLT
38	BOLT
39	HANDWHEEL
40	HW ADAPTOR
41	SELLOCK PIN
42	SELLOCK PIN

SKGF-P EXPLODED VIEW



ITEM	DESCRIPTION
1	ACTUATOR & STEM
2	NUT
3	NYLOK NUT
4	STEM BELLOWS
5	SPLIT PIN
6	CLEVIS & PIN
7	HEX SET SCREW
8	FLAG INDICATOR
9	COUNTER FLANGE
10	CAP SCREW
11	SLEEVE
12	WASHER
13	NUT
14	GALVANISED PLUG
15	DRIVE LUBRICATOR
16	BLADE/GATE
17	STUDS CHEESE
18	WIPER
19	WIPER CLAMP
20	WASHER
21	HEX SET SCREW
22	BODY
23	BOLT SLEEVE
24	BOLT
25	BOLT
26	NUT
27	YOKE PLATE
28	WASHER
29	BOLT
30	BOLT
31	BOLT
32	YP BRACKET



Additional Product Specific Maintenance Procedures

RF-SKG W (Wafer)

• Sleeve removal

This operation may only be done with the valve removed from the line and in the open position

- Disconnect all accessories to the valve that are not part of the valve's construction (Air feeds, electrical and hydraulic connections etc)
- Remove the valve from the line
- Remove sleeve from the valve

• Sleeve replacement

- Thoroughly clean any residue slurry from the valve body
- Apply a liberal coating of the approved silicon grease to the body halves
- Coat the exterior of the sleeves with a thin coating of grease, this allows the sleeve to move freely in the body casting



IT IS RECOMMENDED TO REPLACE BOTH SLEEVES

• Gate replacement

Ensure that the valve is in the open position

- Support the valve in the vertical position
- Remove sleeves from the valve as per "sleeve removal" instructions
- Remove fitted proximity switches and proximity protective covers
- Slacken the upper and lower bolts which secure the yoke plates by removing the nuts
- Carefully remove the "front" yoke plate and refit the lower yoke bolt nuts "finger tight"
- Loosen the rear yoke plate away from the valve body
- Remove the split pin retaining the clevis pin and then remove the clevis pin
- Remove the actuator
- The gate may then be removed from the body of the valve
- To replace with a new gate reverse the sequence of operation above

• Gate wiper replacement

- Remove the bolts holding the gate wiper in place
- Remove the assembled wiper unit
- Remove the bolts holding the HDPE wiper pad to the L frame
- Replace the HDPE wiper
- Fasten the bolts holding the HDPE wiper to the L frame
- Fit the assembled unit back to the body by fastening the bolts
- Do this from both sides



Other World Class Performance Slurry Valves

RF Valve® and aiRFlex® pinch valves

The world's most complete line of pinch valves in standard ASME/ANSI B16, DIN and ISO face-to-face dimensions from 1" to 60" (DN25 to DN1500).

- Patented non-stretch, anti-stress folds in all elastomer tubes
- In-line elastomer tube change capability without removing the valve from the pipeline
- Most advanced wear sensing technology for preventative maintenance alert



Insamcor® MH and MLB slurry valves

Bi-directional wafer mono-flange knife gate valves suitable for end-of-line installation.

- Combination primary transverse seal and secondary stuffing box seal for severe applications
- Mechanically retained moulded seat with no seat pockets
- MH sizes 2" to 24" (DN50 to DN600)
- MLB sizes 28" to 48" (DN700 to DN1200)



Insamcor® LW semi-lugged slurry valves

Bi-directional wafer semi-lugged knife gate valve designed for slurry applications.

- Stuffing box seal to atmosphere
- Mechanically retained moulded seat with no seat pockets
- Self-cleaning flush out corners prevent slurry build-up in sealing area
- Easy mounting of proximity or limit switches
- Sizes 2" to 24" (DN50 to DN600)



Insamcor® PB ported blade slurry valves

Bi-directional ported blade valve suitable for slurries containing large particles.

- Two heavy duty elastomer sleeves are compressed against a ported blade through its entire travel
- The ported blade allows granular slurries of size similar to the blade thickness to be drawn through the seals and flushed out of the valve
- Sizes 2" to 24" (DN50 to DN600)



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