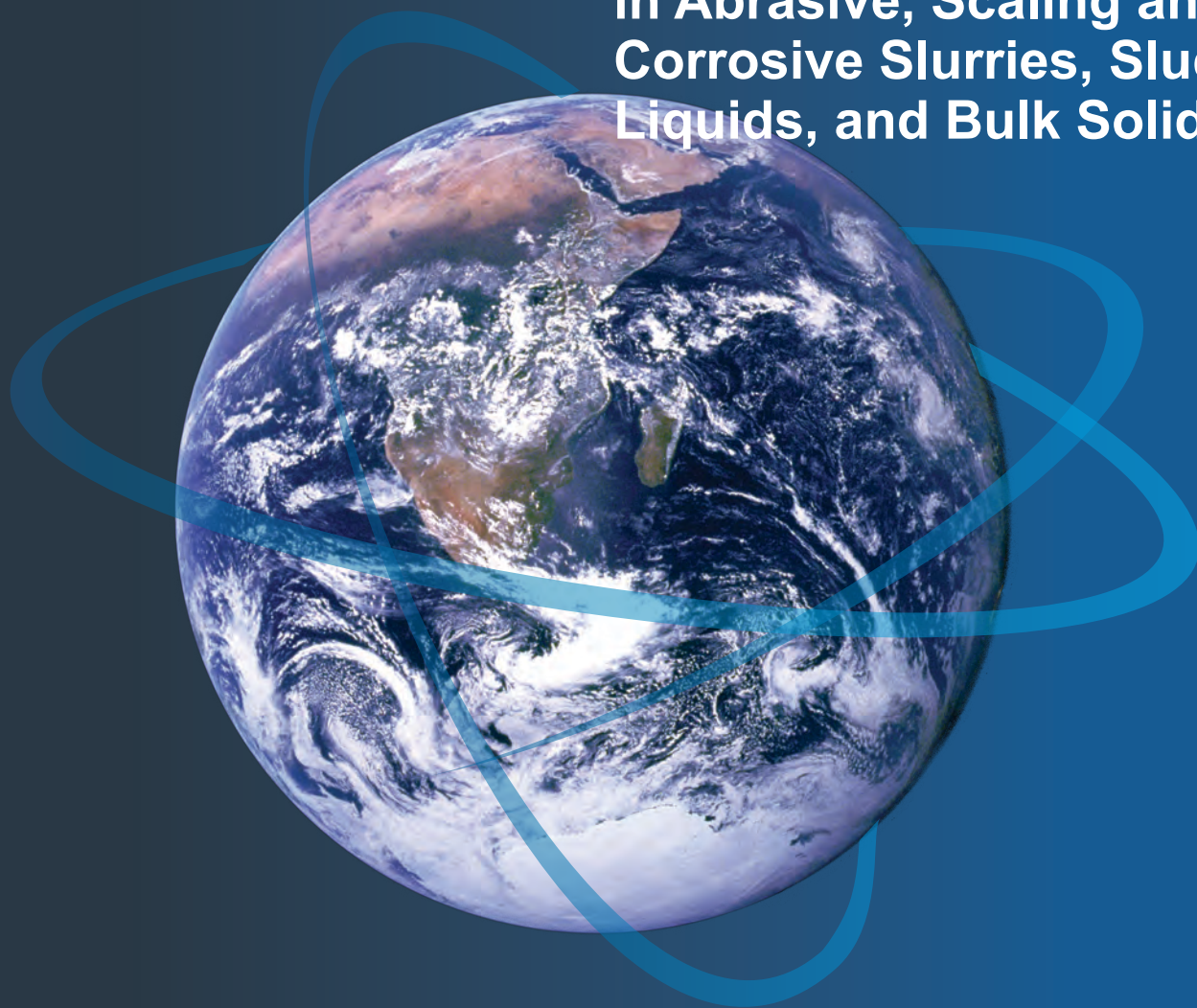




**World Class Performance  
in Abrasive, Scaling and  
Corrosive Slurries, Sludge,  
Liquids, and Bulk Solids**



# ***IOM MANUAL***

***Installation, Operation & Maintenance Manual***



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

- SKG F: Slurry Knife Gate, Flanged
- SKG W: Slurry Knife Gate, Wafer
- LW: Lugged Wafer
- MH: Mono Flanged, High Pressure
- MLB: Mono Flanged, Large Bore
- PB: Ported Blade

**The purpose of this manual is to:**

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

**If more technical information is required, please contact your local DFC distributor or any of our global operations:**

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## Specifications

### RF - SKG 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 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.

### RF-INSAMCOR LW Ductile Iron - Soft Rubber Lined

The knife gate valve will be of wafer style and semi lugged design with the bore and connecting faces soft rubber lined. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be fully moulded with a lip seal and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through a combination adjustable stuffing box acting as the primary seal and a secondary transverse seal. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation.

### RF-INSAMCOR LW Ductile Iron - Fusion Bonded Epoxy

The knife gate valve will be of wafer style and semi lugged design with a fusion bonded epoxy coated ductile iron body. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be fully moulded with a lip seal and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through a combination adjustable stuffing box acting as the primary seal and a secondary transverse seal. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation.



## **RF-INSAMCOR LW - Stainless Steel**

The knife gate valve will be of wafer style and semi lugged design with a CF8M stainless steel body. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be machined PTFE and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through an adjustable stuffing box and gland design. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation and PTFE anti-friction pads to keep the gate centralised and eliminate scoring between the gate and the body.

## **RF-INSAMCOR MH Ductile Iron - Soft Rubber Lined**

The knife gate valve will be of wafer style and mono ring flanged with the bore and connecting faces soft rubber lined. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be fully moulded with a lip seal and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through a combination transverse seal acting as the primary seal and a secondary adjustable stuffing box seal. The transverse seal must be repackable under full line pressure in the open and closed position while the stuffing box seal must be replaceable, with the valve in the fully open position. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation.

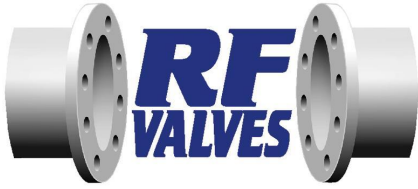
## **RF-INSAMCOR MH Ductile Iron - Fusion Bonded Epoxy**

The knife gate valve will be of wafer style and mono ring flanged with a fusion bonded epoxy coated ductile iron body. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be fully moulded with a lip seal and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through a combination transverse seal acting as the primary seal and a secondary adjustable stuffing box seal. The transverse seal must be repackable under full line pressure in the open and closed position while the stuffing box seal must be replaceable, with the valve in the fully open position. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation.

## **RF-INSAMCOR MLB Ductile Iron - Soft Rubber Lined**

The knife gate valve will be of wafer style and mono ring flanged with the bore and connecting faces soft rubber lined. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be extruded and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through a combination transverse seal acting as the primary seal and a secondary adjustable stuffing box seal. The transverse seal must be repackable under full line pressure in the open and closed position while the stuffing box seal must be replaceable, with the valve in the fully open position, under full line pressure. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation.





## **RF-INSAMCOR MLB Ductile Iron - Fusion Bonded Epoxy**

The knife gate valve will be of wafer style and mono ring flanged with a fusion bonded epoxy coated ductile iron body. The design will allow for bi-directional flow against maximum operating pressure. The body seal must be extruded and must be mechanically retained in the valve body. The gate's sides must remain in contact with the body seal during opening and closing of the valve and the gate must be guided by the valve body. The sealing to atmosphere must be achieved through a combination transverse seal acting as the primary seal and a secondary adjustable stuffing box seal. The transverse seal must be repackable under full line pressure in the open and closed position while the stuffing box seal must be replaceable, with the valve in the fully open position, under full line pressure. The internal bore will include self-cleaning flush out corners and there will be no seat pockets or cavities in the bore for media to settle in. The valve must incorporate PTFE scrapers to keep the blade free from any foreign matter over the whole width of the gate during operation.

### **RF-INSAMCOR PB**

Heavy duty ported blade knife gate valve shall be a wafer, bi-directional valve with flushing abilities. The bore shall be formed by two heavy duty elastomer sleeves, one either side of the gate integrally moulded with a stiffener ring. The stiffener ring shall maintain the shape of the sleeve. The sleeves shall be compressed between the pipe flanges once installed.

The valve shall be of full port design. When in the open and closed position the stainless steel gate shall always be in contact with either side of the gate. On closing particles of similar size to the valves blade thickness shall be capable of being deposited into the lower chest area of the valve where a flushing arrangement is preferred. In order to prevent build-up of product the flushing ports shall be piped up and fully operational or the bottom door removed. The sealing to atmosphere must be achieved through an adjustable stuffing box seal.

The yoke design will allow for easy mounting of proximity or limit switches. Provision must be made for lockouts in the open and closed position. The mounting plate 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
- 2a. SKG type valves should be stored with their gates in the open position, alleviating stresses on their sleeves
- 2b. LW, MH and MLB type valves should be stored with their gates in the 5% open position
- 2c. PB valves should be stored with their gates in the closed position

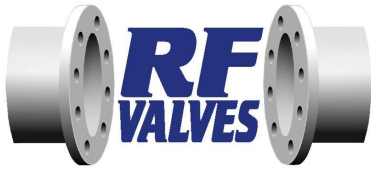
**Please note that if “spring to extend” or “spring to extract” cylinders are mounted to any valve the gate will be in the position where the cylinder spring is fully extended**

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 DFC 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
- DFC 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 DFC 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.

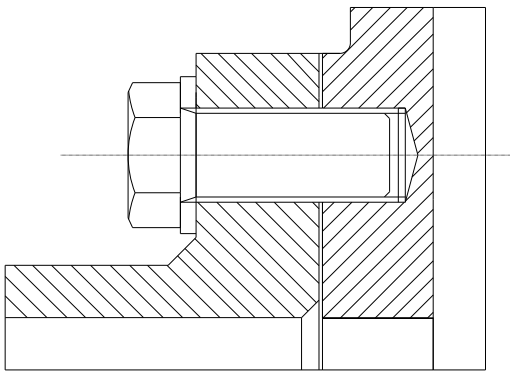


**When installing valves please take note of the flange bolting guidelines for:**

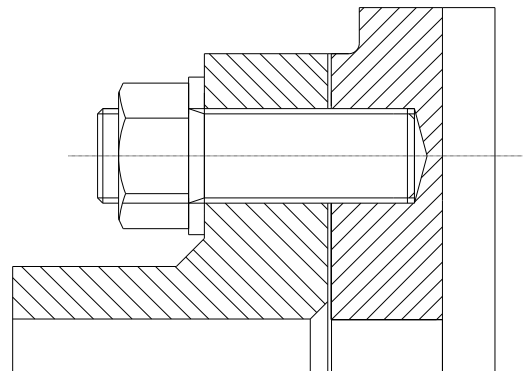
- Tapped blind holes
- Through holes on flanged valves
- Through holes on wafer valves

## **Flange bolting guide lines: Tapped blind holes**

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

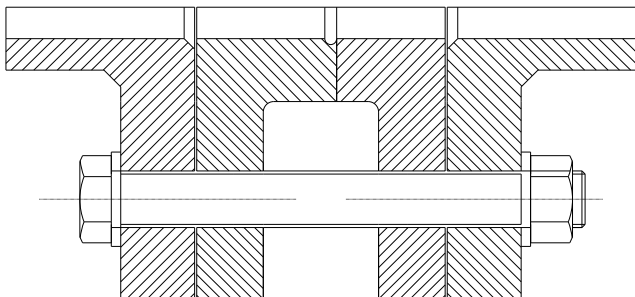


Using engineering studs: This is the preferred method

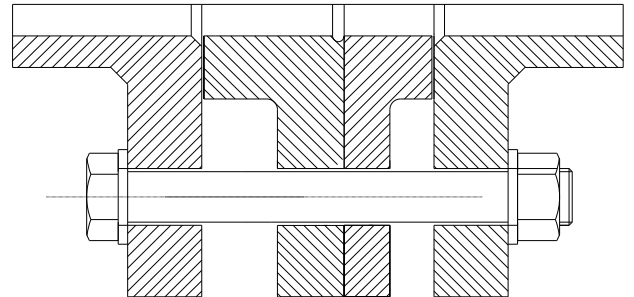


## **Flange bolting guide lines: Through holes, Flanged and Wafer design**

### **Flanged**



### **Wafer**





## Additional Product Specific Installation Procedures

### RF - SKG F

- 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

- 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



## **RF-INSAMCOR - PB**

- The valve 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 sides
- PB valves require either a flushing system to be connected to the bottom door of the valve or alternatively that the bottom door plate be removed totally from the valve. The latter option is only viable if discharge from the valve is into a tank / reservoir or of no concern to the site
- Refer to Table 1: Flange bolting lengths
- Refer to Table 2: Flange bolt tightening torques

## **RF-INSAMCOR - LW**

- Gaskets between valve face and pipe flange face will be required for fusion bonded epoxy valves not for soft rubber lined valves
- Refer to Table 1: Flange bolting lengths

## **RF-INSAMCOR - MH**

- Ensure sufficient clearance between the transverse seal packing edge and the nearest obstacle, space to repack the transverse seal using a packing tool is required
- Gaskets between valve face and pipe flange face will be required for fusion bonded epoxy valves not for soft rubber lined valves
- Refer to Table 1: Flange bolting lengths

## **RF-INSAMCOR - MLB**

- Ensure sufficient clearance between the transverse seal packing edge and the nearest obstacle, space to repack the transverse seal using a packing tool is required
- Gaskets between valve face and pipe flange face will be required for fusion bonded epoxy valves not for soft rubber lined valves
- Refer to Table 1: Flange bolting lengths



**SANS 1000/3: BS4504 T10: PN10**

AS2129 TABLE "D"

# World Class Performance



TABLE 1 CONTINUED

AS2129 TABLE "E"													
DN SIZE	MH			LW			SKG W			SKG F			
	BOLT LENGTH	ENGINEERING STUDS	WASHERS QTY	NUTS QTY	BOLT LENGTH	ENGINEERING STUDS	QTY	BOLT LENGTH	ENGINEERING STUDS	QTY	WASHERS QTY	NUTS QTY	
DN50	M16x100 (4 OFF)		M16 (8 OFF)	M16 (4 OFF)	M16x100 (4 OFF)		M16 (8 OFF)	M16x50 (8 OFF)	M16 (8 OFF)	M16 (8 OFF)			
DN65	M16x105 (6 OFF)		M16 (8 OFF)	M16 (4 OFF)	M16x105 (6 OFF)		M16 (8 OFF)	M16x50 (8 OFF)	M16 (8 OFF)	M16 (8 OFF)			
DN80	M16x105 (6 OFF)	M16x50 (4 OFF)	M16 (20 OFF)	M16 (10 OFF)	M16x105 (6 OFF)	M16x50 (4 OFF)	M16 (20 OFF)	M16x50 (8 OFF)	M16 (8 OFF)	M16 (8 OFF)	M16x70 (8 OFF)	M16 (8 OFF)	
DN100	M16x110 (6 OFF)	M16x55 (4 OFF)	M16 (20 OFF)	M16 (10 OFF)	M16x110 (6 OFF)	M16x55 (4 OFF)	M16 (20 OFF)	M16x50 (8 OFF)	M16 (8 OFF)	M16 (8 OFF)	M16x70 (8 OFF)	M16 (8 OFF)	
DN125	M16x120 (8 OFF)	M16x60 (4 OFF)	M16 (20 OFF)	M16 (10 OFF)	M16x120 (8 OFF)	M16x60 (4 OFF)	M16 (20 OFF)	M16x50 (8 OFF)	M16 (8 OFF)	M16 (8 OFF)			
DN150	M16x130 (6 OFF)	M16x70 (4 OFF)	M16 (20 OFF)	M16 (10 OFF)	M16x130 (6 OFF)	M16x70 (4 OFF)	M16 (20 OFF)	M16x55 (16 OFF)	M16 (16 OFF)	M16 (16 OFF)			
DN200	M16x150 (6 OFF)	M16x70 (4 OFF)	M16 (20 OFF)	M16 (10 OFF)	M16x150 (6 OFF)	M16x70 (4 OFF)	M16 (20 OFF)	M16x55 (16 OFF)	M16 (16 OFF)	M16 (16 OFF)	M20x70 (16 OFF)	M20 (16 OFF)	
DN250	M20x155 (8 OFF)	M20x70 (4 OFF)	M20 (24 OFF)	M20 (16 OFF)	M20x155 (8 OFF)	M20x70 (4 OFF)	M20 (24 OFF)	M20x65 (16 OFF)	M20 (16 OFF)	M20 (16 OFF)	M20x70 (16 OFF)	M20 (16 OFF)	
DN300	M20x170 (8 OFF)	M20x75 (8 OFF)	M20 (32 OFF)	M20 (16 OFF)	M20x170 (8 OFF)	M20x75 (8 OFF)	M20 (32 OFF)	M20x70 (24 OFF)	M20 (24 OFF)	M20 (24 OFF)	M20x75 (16 OFF)	M20 (16 OFF)	
DN350	M20x170 (8 OFF)	M20x80 (8 OFF)	M20 (32 OFF)	M20 (16 OFF)	M20x170 (8 OFF)	M20x80 (8 OFF)	M20 (32 OFF)	M20x75 (24 OFF)	M24 (24 OFF)	M24 (24 OFF)	M24x100 (24 OFF)	M24 (24 OFF)	
DN400	M24x200 (8 OFF)	M24x80 (8 OFF)	M24 (32 OFF)	M24 (16 OFF)	M24x200 (8 OFF)	M24x80 (8 OFF)	M24 (32 OFF)	M24x85 (24 OFF)	M24 (24 OFF)	M24 (24 OFF)	M24x100 (24 OFF)	M24 (24 OFF)	
DN450	M24x200 (8 OFF)	M24x80 (8 OFF)	M24 (32 OFF)	M24 (16 OFF)	M24x200 (8 OFF)	M24x80 (8 OFF)	M24 (32 OFF)	M24x85 (24 OFF)	M24 (32 OFF)	M24 (32 OFF)	M24x100 (32 OFF)	M24 (32 OFF)	
DN500	M24x210 (12 OFF)	M24x90 (8 OFF)	M24 (32 OFF)	M24 (16 OFF)	M24x210 (12 OFF)	M24x90 (8 OFF)	M24 (32 OFF)	M24x100 (24 OFF)	M24 (32 OFF)	M24 (28 OFF)	M24x100 (32 OFF)	M24 (32 OFF)	
DN600	M30x250 (12 OFF)	M30x100 (8 OFF)	M30 (32 OFF)	M30 (16 OFF)	M30x250 (12 OFF)	M30x100 (8 OFF)	M30 (32 OFF)	M30x100 (24 OFF)	M30 (32 OFF)	M30 (28 OFF)	M30x100 (32 OFF)	M30 (32 OFF)	
ASME B16.5 CLASS 150													
DN SIZE	MH			LW			SKG W			SKG F			
	BOLT LENGTH	ENGINEERING STUDS	WASHERS QTY	NUTS QTY	BOLT LENGTH	ENGINEERING STUDS	QTY	BOLT LENGTH	ENGINEERING STUDS	QTY	WASHERS QTY	NUTS QTY	
DN50	5/8"x3.93" (4 OFF)		5/8" (8 OFF)	5/8" (4 OFF)	5/8"x3.93" (4 OFF)		5/8" (8 OFF)	5/8"x2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)			
DN65	5/8"x3.93" (4 OFF)		5/8" (8 OFF)	5/8" (4 OFF)	5/8"x3.93" (4 OFF)		5/8" (8 OFF)	5/8"x2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)			
DN80	5/8"x3.93" (2 OFF)	5/8"x1.96" (4 OFF)	5/8" (8 OFF)	5/8" (4 OFF)	5/8"x3.93" (2 OFF)	5/8"x1.96" (4 OFF)	5/8" (8 OFF)	5/8"x2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)	5/8"x2.75" (16 OFF)	5/8" (16 OFF)	
DN100	5/8"x3.93" (6 OFF)	5/8"x2.16" (4 OFF)	5/8" (20 OFF)	5/8" (10 OFF)	5/8"x3.93" (6 OFF)	5/8"x2.16" (4 OFF)	5/8" (20 OFF)	5/8"x2" (16 OFF)	5/8" (16 OFF)	5/8" (16 OFF)	5/8"x2.75" (16 OFF)	5/8" (16 OFF)	
DN125	3/4"x4.92" (6 OFF)	3/4"x2.36" (4 OFF)	3/4" (20 OFF)	3/4" (10 OFF)	3/4"x4.92" (6 OFF)	3/4"x2.36" (4 OFF)	3/4" (20 OFF)	3/4"x2" (16 OFF)	3/4" (16 OFF)	3/4" (16 OFF)			
DN150	3/4"x4.92" (6 OFF)	3/4"x2.75" (4 OFF)	3/4" (20 OFF)	3/4" (10 OFF)	3/4"x4.92" (6 OFF)	3/4"x2.75" (4 OFF)	3/4" (20 OFF)	3/4"x2" (16 OFF)	3/4" (16 OFF)	3/4" (16 OFF)			
DN200	3/4"x5.90" (6 OFF)	3/4"x2.75" (4 OFF)	3/4" (20 OFF)	3/4" (10 OFF)	3/4"x5.90" (6 OFF)	3/4"x2.75" (4 OFF)	3/4" (20 OFF)	3/4"x2.55" (16 OFF)	3/4" (16 OFF)	3/4" (16 OFF)			
DN250	7/8"x6.29" (8 OFF)	7/8"x2.75" (8 OFF)	7/8" (32 OFF)	7/8" (16 OFF)	7/8"x6.29" (8 OFF)	7/8"x2.75" (8 OFF)	7/8" (32 OFF)	7/8"x2.75" (24 OFF)	7/8" (24 OFF)	7/8" (24 OFF)			
DN300	7/8"x6.29" (8 OFF)	7/8"x2.95" (8 OFF)	7/8" (32 OFF)	7/8" (16 OFF)	7/8"x6.29" (8 OFF)	7/8"x2.95" (8 OFF)	7/8" (32 OFF)	7/8"x2.95" (24 OFF)	7/8" (24 OFF)	7/8" (24 OFF)			
DN350	1"x6.89" (8 OFF)	1"x3.14" (8 OFF)	1" (32 OFF)	1" (16 OFF)	1"x6.89" (8 OFF)	1"x3.14" (8 OFF)	1" (32 OFF)	1"x2.95" (24 OFF)	1" (24 OFF)	1" (24 OFF)			
DN400	1"x7.87" (10 OFF)	1"x3.14" (12 OFF)	1" (44 OFF)	1" (22 OFF)	1"x7.87" (10 OFF)	1"x3.14" (12 OFF)	1" (44 OFF)	1"x3.34" (24 OFF)	1" (24 OFF)	1" (24 OFF)			
DN450	1.18"x8.66" (12 OFF)	1.18"x3.54" (8 OFF)	1.18" (40 OFF)	1.18" (20 OFF)	1.18"x8.66" (12 OFF)	1.18"x3.54" (8 OFF)	1.18" (40 OFF)	1.18"x3.35" (24 OFF)	1.18" (24 OFF)	1.18" (28 OFF)			
DN500	1.18"x9.44" (14 OFF)	1.18"x3.54" (12 OFF)	1.18" (52 OFF)	1.18" (26 OFF)	1.18"x9.44" (14 OFF)	1.18"x3.54" (12 OFF)	1.18" (52 OFF)	1.18"x4" (32 OFF)	1.18" (40 OFF)	1.18" (38 OFF)			
DN600	1.14"x11.02" (14 OFF)	1.14"x3.93" (12 OFF)	1.14" (52 OFF)	1.14" (26 OFF)	1.14"x11.02" (14 OFF)	1.14"x3.93" (12 OFF)	1.14" (52 OFF)	1.14"x4" (32 OFF)	1.14" (40 OFF)	1.14" (38 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

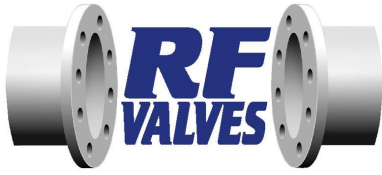
Maintenance procedures are slightly different to each of the DFC branded knife gate valves, therefore each range will be addressed individually

### **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



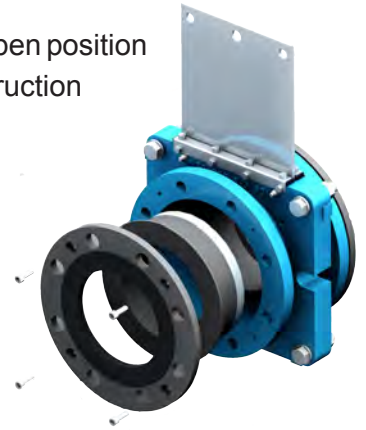
## Additional Product Specific Maintenance Procedures

### RF - SKG 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

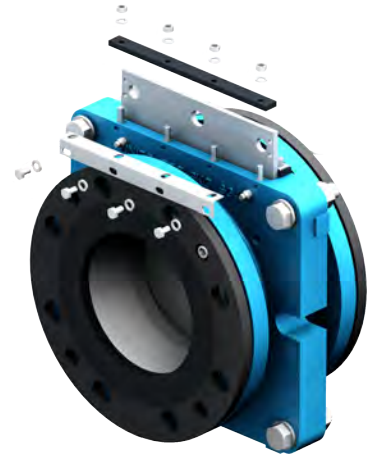
- Support the valve in the vertical position
- Remove sleeves and counter flanges from the valve as per above instructions
- Remove fitted proximity switches and protective covers
- Slacken the upper and lower bolts which secure the yoke plates by removing the nuts
- Carefully remove the “front” yoke 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

# World Class Performance



## • 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





## RF - SKG W

### • 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





## RF-INSAMCOR - PB

### • Stuffing box seal - leak to atmosphere

This operation may be done in line and under full line pressure

- The bottom of each yoke plate has cut-outs to fit a spanner onto the gland follower nuts
- Tighten these nuts evenly, this will compress the gland packing material and prevent further leakage to atmosphere
- Always tighten the nuts evenly to ensure that the gland follower is “pulled down” straight and not forced against one side of the gate but rather keeping the gate in the middle of the follower at all times

### • Stuffing box packing replacement

This can be done both in-line or out of line

#### • In-line

- Open the gate fully
- Remove fitted proximity switches and accessories
- Remove the stuffing box and gland fastening nuts
- Lift the gland follower around the blade until it hits the stem
- Remove the packing material
- Insert new packing material
- Drop the gland follower till it meets the packing material
- Replace the stuffing box and gland fastening nuts
- Tighten nuts adequately

#### • Out of line

- Support the valve in the vertical position
- Remove sleeves from the valve as per “sleeve removal” instructions
- Remove fitted proximity switches and accessories
- Remove the stem clevis bolt
- Remove the actuator
- Remove both yoke plates
- Remove the stuffing box and gland nuts and remove the gland follower over the blade
- Remove the gland packing
- Fit new gland packing
- Assemble by reversing the sequence of operation above





### • Sleeve removal

This operation may only be done with the valve removed from the line

- 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 half open position

- Support the valve in the vertical position
- Remove sleeves from the valve as per above instructions
- Remove fitted proximity switches and proximity protective covers
- Remove the stem clevis bolt
- Remove the actuator
- Remove both yoke plates
- Remove the stuffing box and gland nuts and remove the gland follower over the blade
- Remove the gland packing
- The gate may then be removed from the body of the valve
- To replace with a new gate reverse the sequence of operation above



## RF-INSAMCOR - LW

### • Stuffing box seal - leak to atmosphere

This operation may be done in line and under full line pressure

- The bottom of each yoke plate has cut-outs to fit a spanner onto the gland follower nuts or enter from the side opening between the yoke plates
- Tighten these nuts evenly, this will compress the gland packing material and prevent further leakage to atmosphere
- Always tighten the nuts evenly to ensure that the gland follower is “pulled down” straight and not forced against one side of the gate but rather keeping the gate in the middle of the follower at all times

### • Stuffing box packing replacement

This can be done both in-line or out of line

**NB - WHEN DONE IN LINE ENSURE THAT THE LINE IS ISOLATED. UNDER NO PRESSURE**

#### • In-line

- Open the gate fully
- Remove fitted proximity switches and accessories
- Remove the stuffing box and gland fastening nuts
- Lift the gland follower around the blade until it hits the stem
- Remove the packing material
- Insert new packing material
- Drop the gland follower till it meets the packing material
- Replace the stuffing box and gland fastening nuts
- Tighten nuts adequately

#### • Out of line

- Support the valve in the vertical position
- Remove fitted proximity switches and accessories
- Remove the stem clevis bolt
- Remove the actuator still attached to the mounting plate
- Remove both yoke plates
- Remove the stuffing box and gland nuts and remove the gland follower over the blade
- Remove the gland packing
- Fit new gland packing
- Assemble by reversing the sequence of operation above





## • Seal kit replacement

A seal kit consists of all seals and scrapers within the RF-INSAMCOR LW knife gate valve. This operation may only be done with the valve removed from the line and preferably in a workshop

## • Stripping the valve

- Remove fitted proximity switches and accessories
- Remove valve from line and return to a workshop
- Position valve with housing on the workbench (thicker body half)
- Remove stem / piston rod bolt
- Remove lower yoke bolts that hold the yokes to the valve body
- Remove entire topwork assembly
- Remove gland fastening nuts
- Remove gland
- Remove all valve body fasteners
- Split valve cover from the housing
- Remove gland packing material



- Remove blade from housing
- Remove moulded body seal and scrapers from housing
- Remove transverse seal and scrapers from cover
- Remove barrier scrapers from both housing and cover (Soft Rubber Lined valves only)
- Use a wire brush and clean the internals of both the housing and cover - DO NOT damage rubber lining on soft rubber lined valves

## • Assembling the valve

- Place housing on the workbench with the blade recess facing up
- Fit o-ring cord behind the transverse seal attached to the moulded body seal
- Fit o-ring cord behind the loose transverse seal
- Fit loose transverse seal to the cover
- Fit moulded body seal to the housing
- Fit 4x2 PTFE scrapers in the transverse seals on both the housing and cover
- Fit barrier scrapers to both housing and cover (Soft rubber lined valves only) Barrier scraper consist of 2 x DIA 2mm o-ring cords, 1 x 6x6 square lip seal, 2 x 4x2 PTFE scraper blades



Barrier scraper assembly

- Fit stopper blade and push to the completely closed position
- Fit the cover on top of the housing
- Fasten body bolts
- Fit stuffing box packing material. For each layer of packing make sure the join is on opposite sides of the stuffing box
- Fit gland follower
- Tighten gland fastening nuts
- Fit topworks by fastening two lower yoke bolts
- Fasten stem / piston rod fastener





## RF-INSAMCOR - MH

### • Leak to atmosphere through the stuffing box

This can be rectified in two ways. The MH valve has combination transverse and stuffing box sealing to atmosphere

#### • Scenario A: Tighten the stuffing box gland

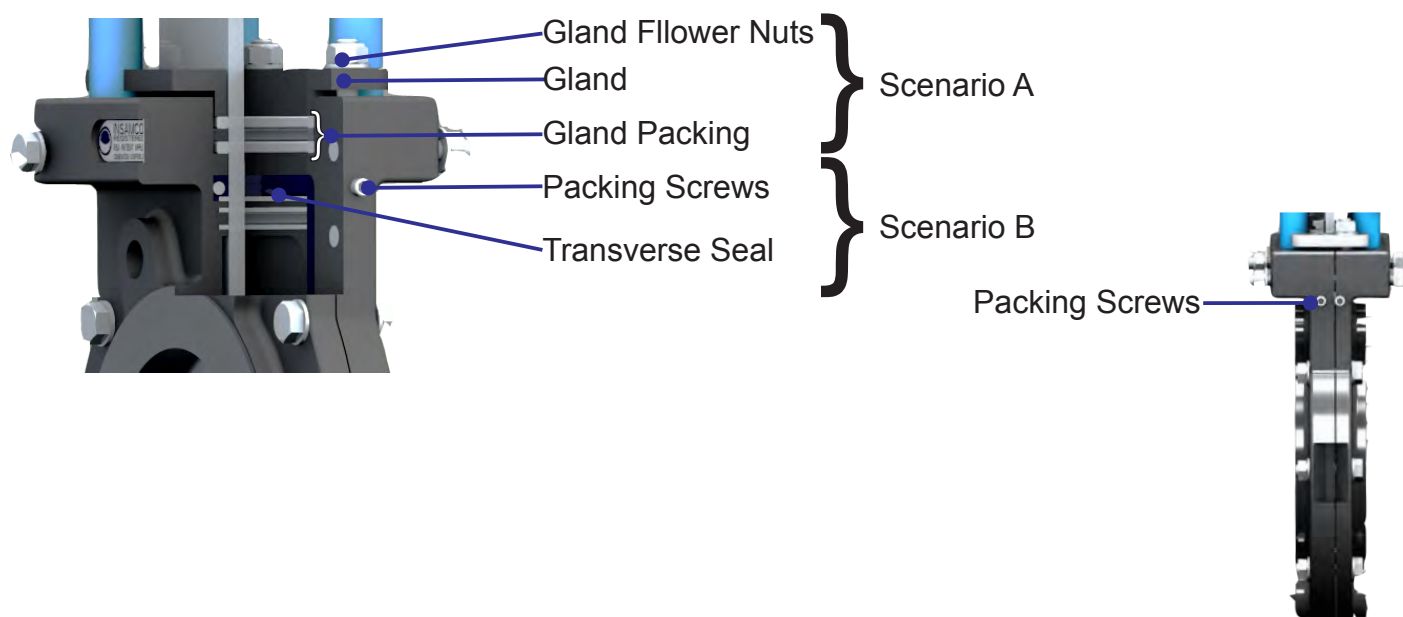
This operation may be done in line and under full line pressure

- Fit a spanner onto the gland follower nuts
- Tighten these nuts evenly, this will compress the gland packing material and prevent further leakage to atmosphere
- Always tighten the nuts evenly to ensure that the gland follower is “pulled down” straight and not forced against one side of the gate but rather keeping the gate in the middle of the follower at all times

#### • Scenario B: Re-packing the transverse seal

This operation may be done in line and under full line pressure

- Each valve is supplied with a packing tool and transverse seal packing material
- Remove 1 packing screw with the aid of an allen key. There are 4 packing screws per valve, 2 per side
- Using the packing tool and transverse seal packing material push the material into the space where the packing screw was removed
- Fit the packing screw again and repeat to all 4 packing screws evenly, making sure the gate is kept central. DO NOT OVERPACK ONE SIDE OF THE VALVE, instead repeat the sequence twice if necessary



## • Stuffing box packing replacement

This can be done both in-line or out of line

**NB - WHEN DONE IN LINE ENSURE THAT THE LINE IS ISOLATED. UNDER NO PRESSURE**

### • In-line

- Open the gate fully
- Remove fitted proximity switches and accessories
- Remove the stuffing box and gland fastening nuts
- Lift the gland follower around the blade until it hits the stem
- Remove the packing material
- Insert new packing material
- Drop the gland follower till it meets the packing material
- Replace the stuffing box and gland fastening nuts
- Tighten nuts adequately

### • Out of line

- Support the valve in the vertical position
- Remove fitted proximity switches and accessories
- Remove the stem clevis bolt
- Remove the actuator still attached to the mounting plate
- Remove pillars
- Remove the stuffing box and gland nuts and remove the gland follower over the blade
- Remove the gland packing
- Fit new gland packing
- Assemble by reversing the sequence of operation above



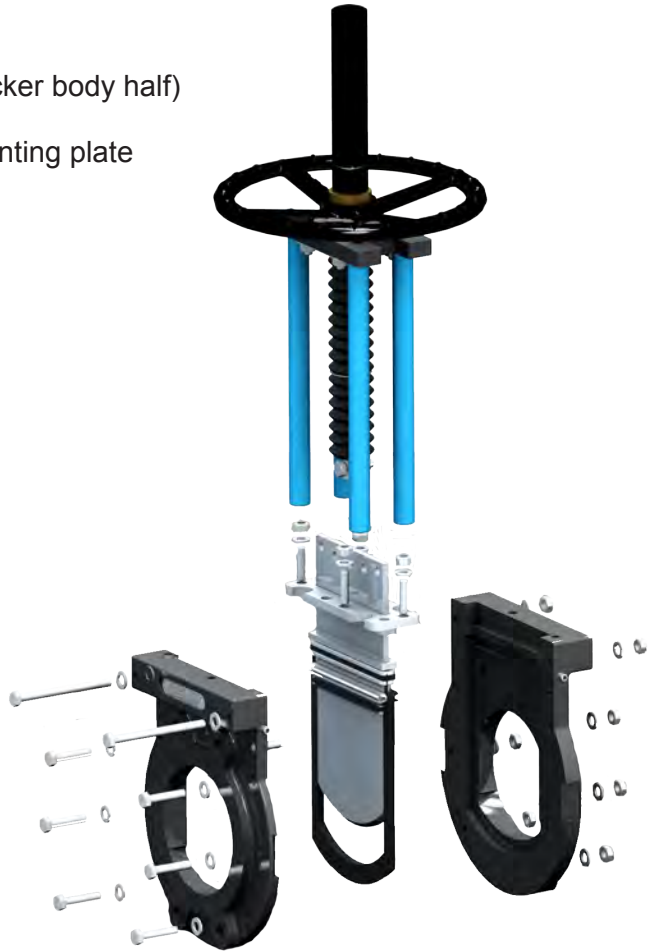


## • Seal kit replacement

A seal kit consists of all seals and scrapers within the RF-INSAMCOR LW knife gate valve. This operation may only be done with the valve removed from the line and preferably in a workshop

## • Stripping the valve

- Remove fitted proximity switches and accessories
- Remove valve from line and return to a workshop
- Position valve with housing on the workbench (thicker body half)
- Remove stem / piston rod bolt
- Remove pillar bolts that hold the pillars to the mounting plate
- Remove entire topwork assembly
- Remove gland fastening nuts
- Remove gland
- Remove all valve body fasteners
- Split valve cover from the housing
- Remove gland packing material



- Remove blade from housing
- Remove moulded body seal and scrapers from housing
- Remove transverse seal and scrapers from cover
- Remove barrier scrapers from both housing and cover (Soft Rubber Lined valves only)
- Use a wire brush and clean the internals of both the housing and cover - DO NOT damage rubber lining on soft rubber lined valves

## • Assembling the valve

- Place housing on the workbench with the blade recess facing up
- Fit transverse seal packing material behind the transverse seal attached to the moulded body seal
- Fit transverse seal packing material behind the loose transverse seal
- Fit loose transverse seal to the cover
- Fit moulded body seal to the housing
- Fit 4x2 PTFE scrapers in the transverse seals on both the housing and cover
- Fit barrier scrapers to both housing and cover (Soft rubber lined valves only) Barrier scraper consist of 2 x DIA 2mm o-ring cords, 1 x 6x6 square lip seal, 2 x 4x2 PTFE scraper blades



Barrier scraper assembly

- Fit stopper blade and push to the completely closed position
- Fit the cover on top of the housing
- Fasten body bolts
- Fit stuffing box packing material. For each layer of packing make sure the join is on opposite sides of the stuffing box
- Fit gland follower
- Tighten gland fastening nuts
- Fit topworks by fastening pillars to the mounting plate
- Fasten stem / piston rod fastener



## RF-INSAMCOR - MLB

### • Leak to atmosphere through the stuffing box

This can be rectified in two ways. The MLB valve has combination transverse and stuffing box sealing to atmosphere

#### • Scenario A: Tighten the stuffing box gland

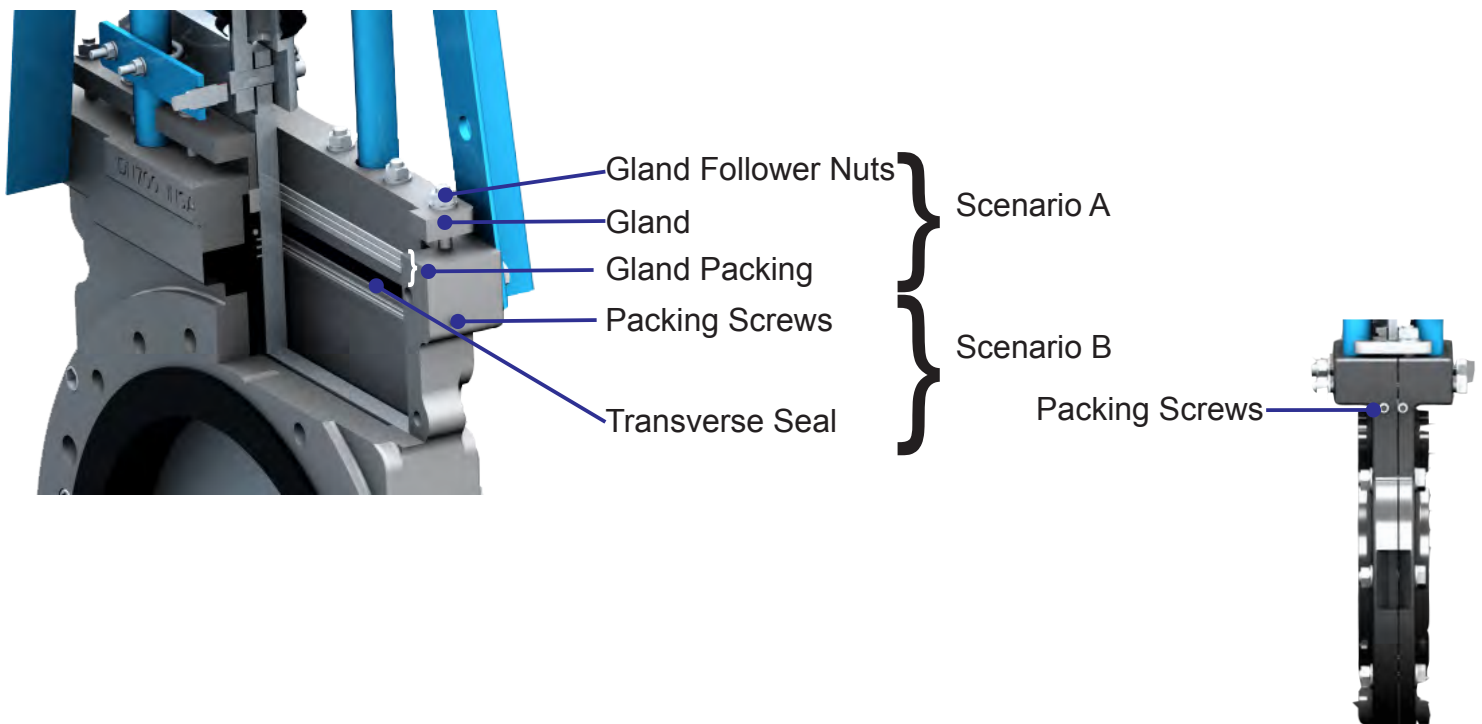
This operation may be done in line and under full line pressure

- Tighten the gland follower nuts evenly, this will compress the gland packing material and prevent further leakage to atmosphere
- Always tighten the nuts evenly to ensure that the gland follower is “pulled down” straight and not forced against one side of the gate but rather keeping the gate in the middle of the follower at all times

#### • Scenario B: Re-packing the transverse seal

This operation may be done in line and under full line pressure

- Each valve is supplied with a packing tool and transverse seal packing material
- Remove 1 packing screw with the aid of an allen key. There are 4 packing screws per valve, 2 per side
- Using the packing tool and transverse seal packing material push the material into the space where the packing screw was removed
- Fit the packing screw again and repeat to all 4 packing screws evenly, making sure the gate is kept central. DO NOT OVERPACK ONE SIDE OF THE VALVE, instead repeat the sequence twice if necessary





## • Stuffing box packing replacement

This can be done both in-line or out of line

**NB - WHEN DONE IN LINE ENSURE THAT THE LINE IS ISOLATED. UNDER NO PRESSURE**

### • In-line

- Open the gate fully
- Remove fitted proximity switches and accessories
- Remove the stuffing box and gland fastening nuts
- Lift the gland follower around the blade until it hits the stem
- Remove the packing material
- Insert new packing material
- Drop the gland follower till it meets the packing material
- Replace the stuffing box and gland fastening nuts
- Tighten nuts adequately

### • Out of line

- Support the valve in the vertical position
- Remove fitted proximity switches and accessories
- Remove the stem clevis bolt
- Remove the actuator still attached to the mounting plate
- Remove all angle frames / pillars
- Remove the stuffing box and gland nuts and remove the gland follower over the blade
- Remove the gland packing
- Fit new gland packing
- Assemble by reversing the sequence of operation above





## • Seal kit replacement

A seal kit consists of all seals and scrapers within the RF-INSAMCOR MLB knife gate valve. This operation may only be done with the valve removed from the line and preferably in a workshop

## • Stripping the valve

- Remove fitted proximity switches and accessories
- Remove valve from line and return to a workshop
- Position valve with housing on the workbench (thicker body half)
- Remove stem / piston rod bolt
- Remove lower angle iron bolts that hold the yokes to the valve body
- Remove entire topwork assembly
- Remove gland fastening nuts
- Remove gland
- Remove all valve body fasteners
- Split valve cover from the housing
- Remove gland packing material



- Remove blade from housing
- Remove extruded body seal, o-ring and scrapers from housing
- Remove transverse seal and scrapers from cover and housing
- Remove barrier scrapers from both housing and cover (Soft Rubber Lined valves only)
- Use a wire brush and clean the internals of both the housing and cover - DO NOT damage rubber lining on soft rubber lined valves

## • Assembling the valve

- Place housing on the workbench with the blade recess facing up
- Fit transverse seal packing material behind the two loose transverse seals
- Fit loose transverse seal to the cover and housing
- Fit extruded body seal to the housing locating in the machined groove and ending next to the transverse seal ends where there is a location point
- Fit 4x2 PTFE scrapers in the transverse seals on both the housing and cover
- Fit barrier scrapers to both housing and cover (Soft rubber lined valves only) Barrier scraper consist of 2 x DIA 2mm o-ring cords, 1 x 6x6 square lip seal, 2 x 4x2 PTFE scraper blades



Barrier scraper assembly

- Fit stopper blade and push to the completely closed position
- Fit the cover on top of the housing
- Fasten body bolts
- Fit stuffing box packing material. For each layer of packing make sure the join is on opposite sides of the stuffing box
- Fit gland follower
- Tighten gland fastening nuts
- Fit topworks by fastening two lower angle bolts
- Fasten stem / piston rod fastener