



華晶精密工業有限公司

FLY GIN CO., LTD.



機械軸封 & 迴轉接頭 & 疏水閥

Mechanical Seals & Rotary Joints & Steam Traps

<http://www.flygin-lhs.com>

[Http://www.lhs0955887677.com](http://www.lhs0955887677.com)



二. 泵浦密封的問題

- 泵浦的外殼是固定的，泵浦軸與葉輪是轉動，由於它的轉動，泵浦殼內部就產生壓力狀況，軸心與泵殼之間間隙會造成液體洩漏出來，若是泵殼內部成真空狀態，空氣就會經間隙吸入不論是漏出或吸入，都會使泵浦操作失常污染環境，所以在泵浦設計和運用上及該位置的密封是不可缺的。
- 機械軸封有動環與靜環兩部份組成一組件，通常有三個點止漏：1 動環迫緊 2 靜環迫緊 3 動環與靜環兩個接觸面，以上三點有任何一點損壞就產生洩漏，一般機械軸封洩漏通常發生在兩個接觸面磨損為最多，次之為動環迫緊與軸心互磨產生溝痕而由溝痕處洩漏。機械軸封分多彈簧式、

單彈簧式、金屬伸縮管式、鐵氟龍伸縮管式、雙頭多、單彈簧式及平衡式、非平衡式。

- 多彈簧式：彈簧小數量多壓力平衡均勻，其缺點是彈簧易受雜物卡住失去彈性且因振動而折斷，又彈性疲乏較為顯著。
- 單彈簧式：不易折斷在高粘度及受雜質較多情形下也不受影響，缺點平衡度較差，長度較長。
- 金屬伸縮管：是由金屬薄片組合起來代替彈簧及密封效果，它綜合單彈簧和多彈簧的優點，壓力平均，扭力震動也容易吸收，缺點易於伸縮管接縫斷裂洩漏。

★註：壓力在 11kg/cm^2 以內使用非平衡式， 12kg/cm^2 以上使用平衡式。

2. The problem of Mechanical Seal

- As every one knows that the case of the pump of the pump is stationary while the Impeller and the pump shaft are rotating parts. Because of this rotation, it creates pressure inside the case, so the liquid will leak from the gap between the shaft and the case. If inside the pump is in vacuum condition, then the air will be sucked into the case. No matter it is leaking or sucking, it will pollute the environment. Therefore we must provide seal system in the pump and usage of the seal system.
- A mechanical seal composes of moving part and stationary part. Usually, there are three points to stop the leakage: (1)Rotating packing (2)stationary packing (3)the contact area between rotating ring and stationary ring. If there is a damage in any part of the above three points, leakage of liquid is unpreventable. Usually, the leakage is mainly from the point (3), then point (1) and point (2).
- Mechanical seal is further subdivided into type multi-spring type, single spring type, metallic flex type, P.T.F.E. flex type, Dual cartridge and

single cartridge double end spring/single spring and balanced and non-balanced type.

- Multi-spring type: many small spring, pressure is evenly distributed. The drawback is that the spring will be easily jammed/broken by foreign substances and the spring will become fatigue easily.
- Single spring: it will not be easily broken and function well under high viscosity and high TDS, but it is quite difficult to balance and it is longer
- Metallic flex type: it is composed of metallic plate to substitute the spring, it has the advantages of single and multi spring type mechanical seal, even pressure distribution, it can absorb huge vibration, and the drawback is that the metallic plate breaks easily and leakage is the result.

★ Note: For pressure below 11kg/cm^2 , suggest to use unbalanced type, And when the pressure is above 12kg/cm^2 , use balance type.



三. 機械軸封的環境控制

- 機械軸封的材質根據設計決定後，經安裝完成運轉，泵浦的溫度、壓力及化學成份都與軸封有關，如果設計沒有問題，而機械軸封在運轉中仍會損壞，其原因除安裝不良之外就是周圍環境如溫度、壓力、清潔狀況等不符合規定的關係，所以環境控制很重要。
- 整個組件各部份都需要同時考慮高溫及化學溶液的侵襲對高溫來說，使密封區間在冷液中冷卻是最好的方法。
- 有些物質在常溫時會凝結成固態，而它在液態時卻又能作為很優良的清潔潤滑劑，這種在機械軸封處就不應冷卻而是加熱（如水玻璃、重油）。
- 另有一項溫度方面的重要考慮是填料函中泵液的沸點，雖然泵液可以保持在沸點以下，但若是填料函

內散熱效率不好，就可能會有熱量的積聚，這些熱量有些是由泵液而來，有些是密封環表面摩擦所生，如果在填料函中積聚的熱量使溫度超過泵液的溫度，則軸封表面間液磨時會氣化，變成局部乾磨，一般的規定填料函內液體的溫度必須維持在低於泵浦入口壓力狀態下的沸點至少 15°C ，因為如果在填料函內蒸發就會使該處的泵液變濃，可能會有鹽類礦物質及有磨損能力的雜質沈積下來充塞機械密封的空隙，造成快速的磨損。

- 管線若易於鏽蝕或泵液所含雜質太多等都不易達成密封的效果，如何將這些雜質帶走或與密封件隔離是很重要的工作。

3. Mechanical seal environmental control

- The use of the material and the design of the mechanical seal depends on the operation, pump temperature, working pressure and chemical composition. Even if there is no defect in the design, the mechanical seal still has the chance to be damaged during the operation, the reasons for that apart from the defect in the installation, the surrounding temperature, pressure and cleanliness also contribute the reason of damage the seal. Therefore, environmental control is very important also.
- As a whole, we have to consider the high temperature and the chemical solving agent during the selection of the material for different parts of the seal.
- Some of the materials will become solid from when the temperature is below boiling point. When it is in liquid form, it is a very good cleaning/lubrication agent, under this situation the mechanical seal location should be heated rather than cooled.
- Another issue to be considered is boiling point of the liquid (filler), even though the liquid may be under boiling point, but if the filler can not disperse the heat efficiently, there will be some heat reminded. This kind of heat may come from pump liquid, some heat comes from friction between the shaft and the mechanical seal o-ring. If temperature is higher the temperature of the liquid, then it will be vaporized and become dry. Usually, the temperature in this area should be around 15 deg C lower than the liquid inside the pump. If it vaporizes the concentration become higher, then the impurity will sedimentate and cause damage to the mechanical seal.
- If the piping is not a rust proof and the impurity is high, the mechanical seal sealing effect is not good. It is very important to separate these impurity or to remove these impurity.



DU2- (非平衡式-U型 P.T.F.E.)

最高壓力：12公斤／平方公分
最高周速：25米／秒
適合溫度：-50°C ~300°C

DU3- (非平衡式-O型 橡膠圈)

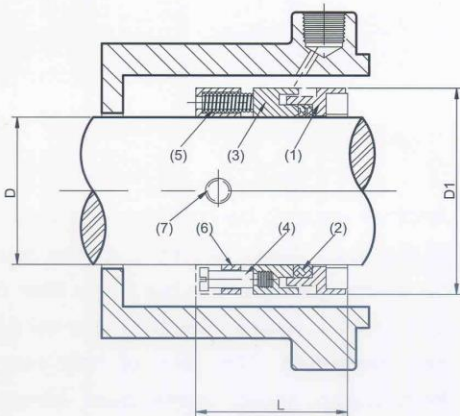
最高壓力：12公斤／平方公分
最高周速：25米／秒
適合溫度：-30°C ~250°C

DU2- (UNBALANCE, U-PACKING P.T.F.E.)

MAX. PRESSURE: 12kg/cm²
MAX. SPEED: 25m/sec
TEMP LIMIT: -50°C ~300°C

DU3- (UNBALANCE, O-RING RUBBER)

MAX. PRESSURE: 12kg/cm²
MAX. SPEED: 25m/sec
TEMP LIMIT: -30°C ~250°C



編號	品名	材質
1	動環	SIC/SUS 316
2	止漏環	(DU2)鐵氟龍 (DU3)橡膠
3	驅動環	SUS 316
4	驅動柱	SUS 316
5	彈簧	SUS 304
6	彈簧座	SUS 316
7	螺絲	SUS 316

P/NO	IDENTIFICATION	MATERIAL
1	SEAL RING	SIC/SUS 316
2	SHAFT PACKING	(DU2)P.T.F.E. (DU3)RUBBER
3	DRIVE RING	SUS 316
4	DRIVE PIN	SUS 316
5	SPRING	SUS 304
6	SPRING SEAT	SUS 316
7	SET SCREW	SUS 316

D	D1	L
Ø20	Ø34	35
Ø22	Ø36	35
Ø24	Ø38	35
Ø25	Ø39	35
Ø28	Ø42	35
Ø30	Ø44	35
Ø32	Ø46	35
Ø33	Ø47	35
Ø35	Ø49	35
Ø38	Ø54	38
Ø40	Ø56	38
Ø42	Ø58	38
Ø43	Ø59	38
Ø45	Ø61	38
Ø48	Ø64	38
Ø50	Ø66	39
Ø52	Ø68	40
Ø53	Ø69	40
Ø55	Ø71	40
Ø58	Ø76	41
Ø60	Ø78	41
Ø63	Ø81	41
Ø65	Ø83	41
Ø67	Ø85	41
Ø70	Ø90	42
Ø75	Ø95	42
Ø80	Ø100	42
Ø85	Ø105	43
Ø90	Ø110	45
Ø95	Ø115	45
Ø100	Ø120	45



DB2



DB2- (平衡式-U型 P.T.F.E.)

最高壓力：35公斤／平方公分
 最高周速：25米／秒
 適合溫度：-50°C ~300°C

DB2- (BALANCE, U-PACKING P.T.F.E.)

MAX. PRESSURE: 35kg/cm²
 MAX. SPEED: 25m/sec
 TEMP LIMIT: -50°C ~300°C

DB3

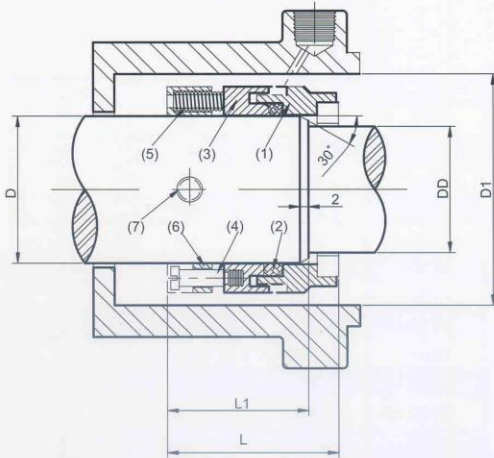


DB3- (平衡式-O型 橡膠圈)

最高壓力：35公斤／平方公分
 最高周速：25米／秒
 適合溫度：-30°C ~250°C

DB3- (BALANCE, O-RING RUBBER)

MAX. PRESSURE: 35kg/cm²
 MAX. SPEED: 25m/sec
 TEMP LIMIT: -30°C ~250°C



編號	品名	材質
1	動環	SIC/SUS 316
2	止漏環	(DB2)鐵氟龍 (DB3)橡膠
3	驅動環	SUS 316
4	驅動柱	SUS 316
5	彈簧	SUS 304
6	彈簧座	SUS 316
7	螺絲	SUS 316

P/NO	IDENTIFICATION	MATERIAL
1	SEAL RING	SIC/SUS 316
2	SHAFT PACKING	(DB2)P.T.F.E. (DB3)RUBBER
3	DRIVE RING	SUS 316
4	DRIVE PIN	SUS 316
5	SPRING	SUS 304
6	SPRING SEAT	SUS 316
7	SET SCREW	SUS 316

D	DD	D1	L	L1
Ø25	Ø22	Ø39	40	33
Ø28	Ø24	Ø42	40	33
Ø30	Ø25	Ø44	40	33
Ø33	Ø28	Ø47	40	33
Ø35	Ø30	Ø49	40	33
Ø38	Ø33	Ø54	42	35
Ø40	Ø35	Ø56	42	35
Ø43	Ø38	Ø59	43	35
Ø45	Ø40	Ø61	43	35
Ø48	Ø43	Ø64	43	35
Ø50	Ø45	Ø66	44	36
Ø53	Ø48	Ø69	44	36
Ø55	Ø50	Ø71	44	36
Ø58	Ø53	Ø76	46	37
Ø60	Ø55	Ø78	46	37
Ø63	Ø58	Ø81	46	37
Ø65	Ø60	Ø83	46	37
Ø67	Ø62	Ø85	46	37
Ø70	Ø65	Ø90	46	37
Ø75	Ø70	Ø95	46	37
Ø80	Ø75	Ø100	46	37
Ø85	Ø80	Ø105	46	37
Ø90	Ø85	Ø110	49	39
Ø95	Ø90	Ø115	49	39
Ø100	Ø95	Ø120	49	39



DKU2- (非平衡式-U型 P.T.F.E.)

最高壓力：12公斤/平方公分
最高周速：15米/秒
適合溫度：-50°C ~300°C

KU3- (非平衡式-O型 橡膠圈)

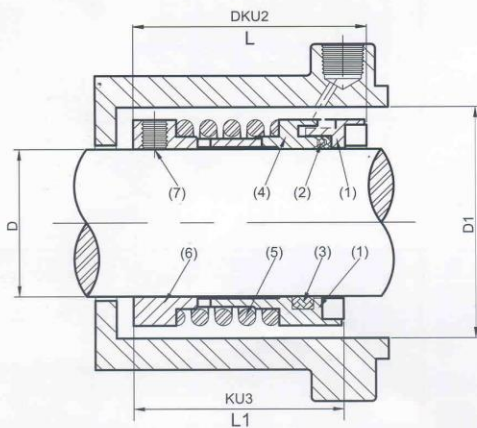
最高壓力：12公斤/平方公分
最高周數：15米/秒
適合溫度：-30°C ~250°C

DKU2- (UNBALANCE, U-PACKING P.T.F.E.)

MAX. PRESSURE: 12kg/cm²
MAX. SPEED: 15m/sec
TEMP LIMIT: -50°C ~300°C

KU3- (UNBALANCE, O-RING RUBBER)

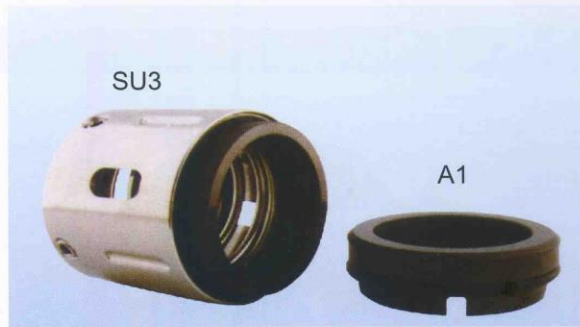
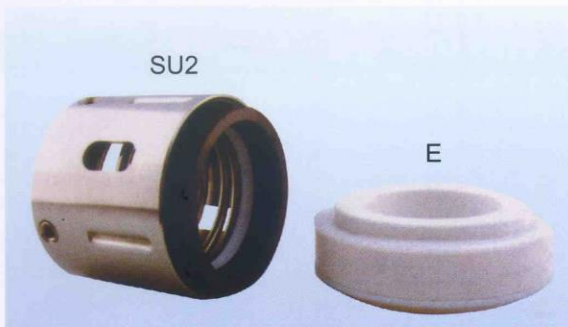
MAX. PRESSURE: 12kg/cm²
MAX. SPEED: 15m/sec
TEMP LIMIT: -30°C ~250°C



編號	品名	材質
1	動環	SIC/SUS 316
2	止漏環	U型 鐵氟龍 O型 橡膠
3	驅動環	SUS 316
4	驅動柱	SUS 316
5	彈簧	SUS 304
6	彈簧座	SUS 316
7	螺絲	SUS 316

P/NO	IDENTIFICATION	MATERIAL
1	SEAL RING	SIC/SUS 316
2	SHAFT PACKING	U-RING P.T.F.E.
3	SHAFT PACKING	O-RING RUBBER
4	DRIVE PIN	SUS 316
5	SPRING	SUS 304
6	SPRING SEAT	SUS 316
7	SET SCREW	SUS 316

D	D1	DKU2	KU3
Ø20	Ø34	46	41
Ø22	Ø36	46	41
Ø24	Ø38	48	43
Ø25	Ø39	48	43
Ø28	Ø42	50	45
Ø30	Ø44	50	45
Ø32	Ø46	50	45
Ø33	Ø47	50	45
Ø35	Ø49	54	49
Ø38	Ø54	57	53
Ø40	Ø56	59	55
Ø42	Ø58	59	55
Ø43	Ø59	59	55
Ø45	Ø61	59	55
Ø48	Ø64	59	55
Ø50	Ø66	62	60
Ø52	Ø68	63	61
Ø53	Ø69	63	61
Ø55	Ø71	63	61
Ø58	Ø76	66	63
Ø60	Ø78	66	63
Ø63	Ø81	66	63
Ø65	Ø83	70	67
Ø67	Ø85	70	67
Ø70	Ø90	71	68
Ø75	Ø95	75	72
Ø80	Ø100	75	72
Ø85	Ø105	80	77
Ø90	Ø110	80	77
Ø95	Ø115	85	82
Ø100	Ø120	85	82



SU2- (非平衡式-V型 P.T.F.E.)

最高壓力：12公斤／平方公分
最高周數：25米／秒
適合溫度：-50°C ~300°C

SU3- (非平衡式-O型 橡膠圈)

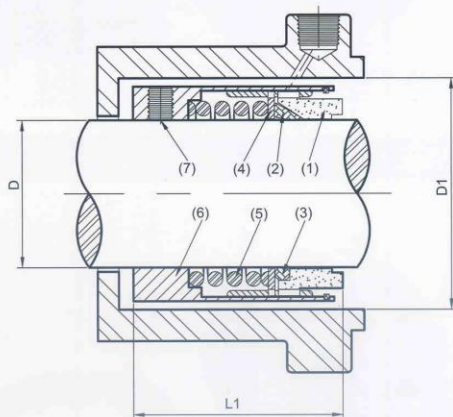
最高壓力：12公斤／平方公分
最高周數：25米／秒
適合溫度：-30°C ~150°C

SU2- (UNBALANCE, V-PACKING P.T.F.E.)

MAX. PRESSURE: 12kg/cm²
MAX. SPEED: 25m/sec
TEMP LIMIT: -50°C ~300°C

SU3- (UNBALANCE, O-RING RUBBER)

MAX. PRESSURE: 12kg/cm²
MAX. SPEED: 25m/sec
TEMP LIMIT: -30°C ~150°C



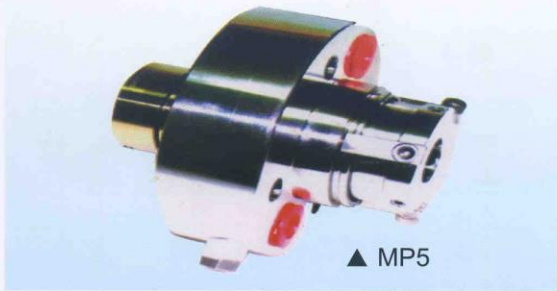
D	D1	L
Ø20	Ø36	41
Ø22	Ø38	41
Ø24	Ø40	43
Ø25	Ø41	43
Ø28	Ø44	45
Ø30	Ø46	45
Ø32	Ø48	45
Ø33	Ø49	45
Ø35	Ø51	49
Ø38	Ø56	53
Ø40	Ø58	55
Ø42	Ø60	55
Ø43	Ø61	55
Ø45	Ø63	55
Ø48	Ø66	55
Ø50	Ø68	60
Ø52	Ø70	61
Ø53	Ø71	61
Ø55	Ø73	61
Ø58	Ø78	63
Ø60	Ø79	63
Ø63	Ø83	63
Ø65	Ø86	67
Ø67	Ø88	67
Ø70	Ø92	68
Ø75	Ø98	72
Ø80	Ø103	72
Ø85	Ø108	77
Ø90	Ø114	77
Ø95	Ø119	82
Ø100	Ø124	82

編號	品名	材質
1	動環	SIC/SUS 316
2	止漏環	U型 鐵氟龍
3	止漏環	O型 橡膠
4	驅動環	SUS 316
5	彈簧	SUS 304
6	彈簧座	SUS 316
7	螺絲	SUS 316

P/NO	IDENTIFICATION	MATERIAL
1	SEAL RING	SIC/SUS 316
2	SHAFT PACKING	U-RING P.T.F.E.
3	SHAFT PACKING	O-RING RUBBER
4	DRIVE RING	SUS 316
5	SPRING	SUS 304
6	SPRING SEAT	SUS 316
7	SET SCREW	SUS 316



TYPE MP5 CARTRIDGE 機械軸封



▲ MP5

TYPE MP9 雙層水冷式機械軸封



▲ MP9

TYPE GB3 高轉數、氣密專用機械軸封



▲ GB3

▲ FZ1

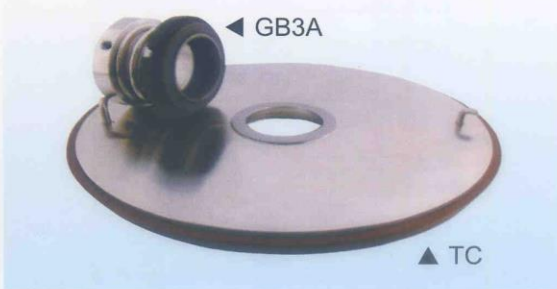
TYPE KU3B 船舶專用機械軸封



▲ KU3B

▲ B3

TYPE GB3A 高流量食品級泵浦專用機械軸封



▲ GB3A

▲ TC

TYPE MU1 汙水、廢水用機械軸封



▲ MU1

▲ AX1

TYPE GB3B 高流量食品級泵浦專用機械軸封



▲ GB3B

▲ FZ2

TYPE EU3R 廢水、化工用機械軸封

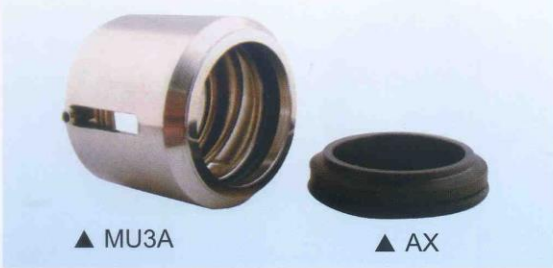


▲ EU3R

▲ AX



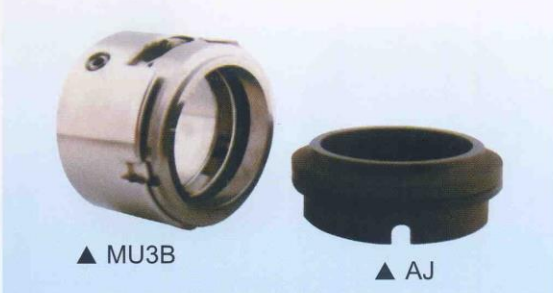
TYPE MU3A 汙水、化工用機械軸封



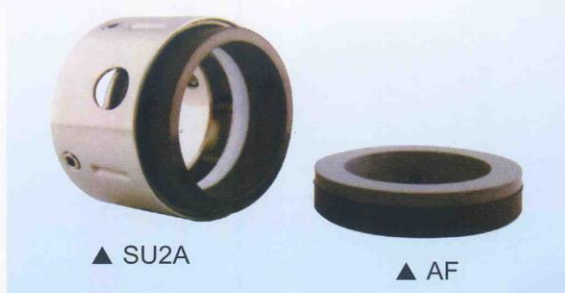
TYPE MU3G 廢水、化工用機械軸封



TYPE MU3B 化工用機械軸封



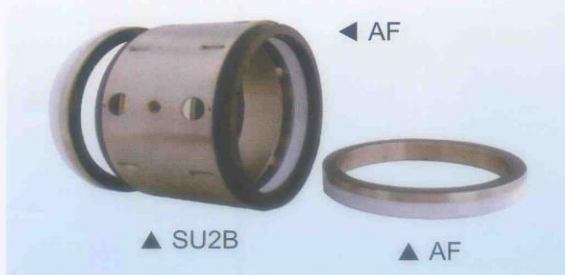
TYPE SU2A 耐腐蝕性、極高溫、極低溫用化工機械軸封



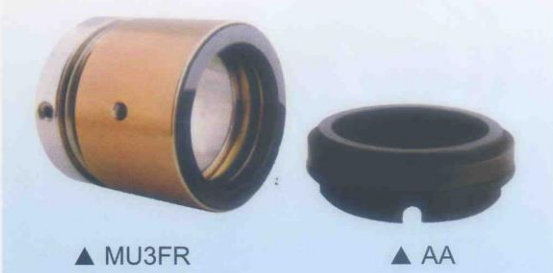
TYPE MU3E 化工用機械軸封



TYPE SU2B 耐腐蝕性、極高溫、極低溫用化工機械軸封



TYPE MU3FR 廢水、化工用機械軸封



TYPE SU3A 工業製程用化工機械軸封



※本目錄軸封型式以非平衡式代表，如需平衡式，請諮詢本公司工程部門。



TYPE TU3 耐高黏度多沉積物流體用化工機械軸封



▲ TU3

▲ B4

TYPE FL-1MA 水泵浦用機械軸封



▲ FL-1MA

▲ LD

TYPE XB1 耐強腐蝕性流體用化工機械軸封



▲ XB1

▲ EB

TYPE FL-111S 水泵浦用機械軸封



▲ FL-111S

▲ LC

TYPE XB3 化工機械軸封



▲ XB3

▲ A1

TYPE FL-111L 水泵浦用機械軸封



▲ FL-111L

▲ LB

TYPE LR82A 迷宮式機械軸封—風車



▲ LR82A 風車

TYPE HO 水泵浦用機械軸封



▲ HO



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