



Rotary Unions

Swivel Joints

*Manufactured in the UK with  
Over 70 Years Experience*

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Throughout this technical manual the designation for pipe threads is:

- 'G' - Parallel pipe thread to BS.2779 and ISO.228/1 (formerly designated B.S.P. - Parallel)
- 'R' - Tapered pipe thread to BS.21 and ISO.7/1 (formerly designated B.S.P. - Taper)

## APPLICATION LIST

Page	Model	Size Range <sup>1</sup>	Air	Gas <sup>3</sup>	Oil Lubricating	Oil Hydraulic	Oil Heat transfer	Steam	Vacuum	Water
4	R.E.	8 (1/4") to 32 (1 1/4")	✓ <sup>2</sup>	✓	✓		✓	✓	✓	✓
6	P.B.	15 (1/2") to 25 (1")	✓ <sup>2</sup>	✓	✓				✓	✓
8	R.E.B.	40 (1 1/2") to 150 (6") <sup>5</sup>	✓ <sup>2</sup>	✓	✓		✓	✓	✓	✓
10	C.B.	8 (1/4") to 32 (1 1/4")					✓ <sup>4</sup>	✓		✓
12	C.B.N.	40 (1 1/2") to 150 (6") <sup>5</sup>					✓ <sup>4</sup>	✓		✓
14	L.C.	8 (1/4") to 20 (3/4")	✓ <sup>2</sup>		✓					✓
15	P.N.	8 (1/4") to 20 (3/4")	✓						✓	
16	M.C.T.	8 (1/4") to 25 (1")	✓ <sup>2</sup>	✓	✓	✓			✓	

### Notes

- ✓ = Suitable but check full working conditions
- <sup>1</sup> = The size stated is the rotary spindle end connection (dimension "A" in all the outline drawings)
- <sup>2</sup> = For lubricated air only. If air is dry and the P.N. is unsuitable, we can provide special seals for other models
- <sup>3</sup> = Dependant on the type of gas and working conditions - refer to our Technical Department
- <sup>4</sup> = Flanges may be required dependant on working temperature
- <sup>5</sup> = Flanges can simplify fitting and assist removal for maintenance on sizes 100 (4") and larger

### TO SELECT THE MODEL:

1. Check the fluid column
2. Match with the size range
3. Turn to the appropriate page for the model indicated to check the full working conditions and any limitations
4. If more than one model is indicated, examine the application information on the appropriate pages

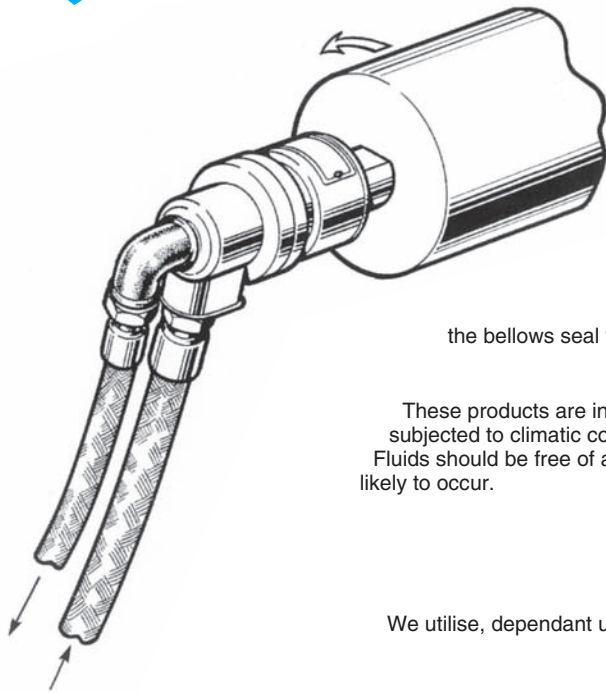
### NEED ADVICE?

Please telephone our Technical Department on (01926) 423191. The following information will be needed:

1. Fluid; 2. Fluid flow rate; 3. Fluid pressure; 4. Fluid temperature; 5. Ambient temperature; 6. Rotational speed; 7. Direction of rotation; 8. Working cycle; 9. Any usual features, e.g. installed outside, open to weather.



# FILTON ROTARY UNIONS - AN INTRODUCTION



A Rotary Union is a device which can be connected to a rotating shaft and allow the leakproof transfer of fluids to and from the stationary services.

The vital components of Rotary unions are the rotary seals and the bearing support systems. For the majority of applications the FILTON BELLOWS SEAL is the most efficient. If pressure and/or speed exceed the capability of the bellows seal we can provide a FILTON MECHANICAL SEAL.

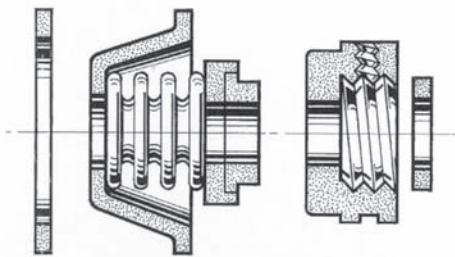
## Important

These products are intended for use on a factory environment. Contact us if the installation is subjected to climatic conditions. Fluids should be free of abrasive particles and water systems should be treated if "scaling" is likely to occur.

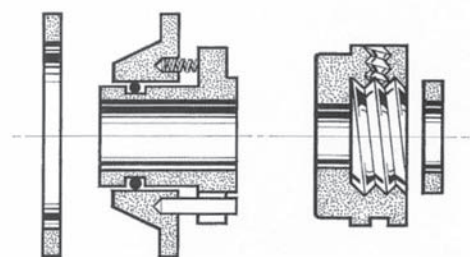
## Rotary Seals

We utilise, dependant upon the application, a bellows seal or a mechanical seal:

### Filton Bellows Seals



### Filton Mechanical Seals



The Filton Bellows Seal has advantages over the mechanical seal on steam, hot water and heat transfer fluids. This seal does not contain any elastomeric components and is therefore satisfactory from sub-zero temperatures up to 300°C.

The Filton Mechanical Seal is utilised for higher pressures, such as hydraulic systems and the higher shaft speeds used, for example, on machine tools. The springs for the mechanical seal are out of the fluid flow area.

The one common factor with both Filton Bellows Seals and Mechanical Seals is the quality of the seal contact faces. These are lapped to a high accuracy and checked optically to ensure the correct flatness is obtained.

## Bearings

The range of Rotary Unions we offer include units with standard ball bearings, angular contact ball bearings and carbon journal and thrust bearings.

The ball bearings used generally have an upper temperature limit of 180°C, (this can be exceeded with special bearings and lubrication), whereas carbon bearings can be used up to 300°C. Carbon bearings have speed limitations which can be far exceeded by ball bearings.

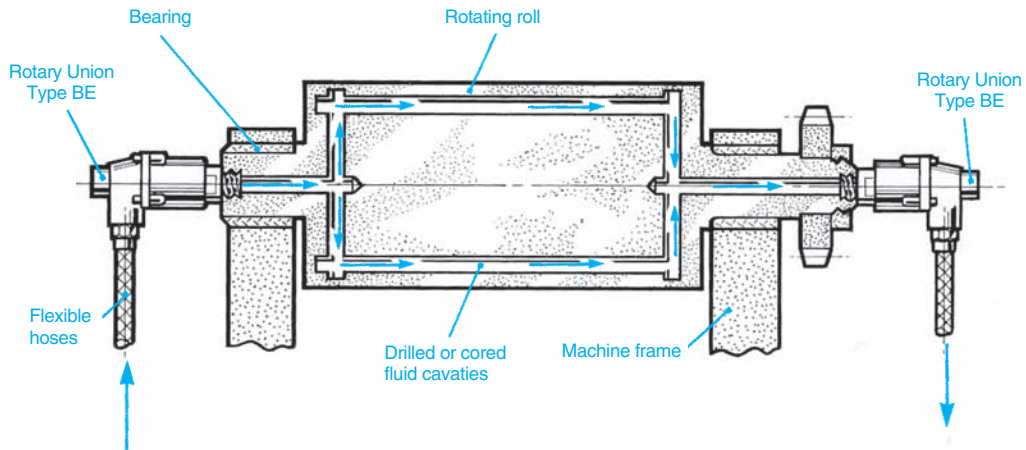
## Who are Filton Limited?

Filton Limited is a Private Limited Company which celebrated its 60th Anniversary in 2002. The Company was founded by Mr William Murray, to manufacture conventional leather oil seals for rotary shafts, but is now universally known as one of the world's leading manufacturers of Rotary Unions, various types of which are described in the following pages. The main interest of the Company is still with rotary seals but using state of the art designs and when required, sophisticated seal face materials which enable us to undertake and solve complex sealing problems. Multi-port Rotary Unions are now common-place, and if a suitable design is not already available our design team is at your disposal to consider the specification needed. **Quality is Paramount.** All components are rigorously inspected during manufacture and every Rotary Union is pressure tested before despatch to ensure satisfactory performance when installed in accordance with our recommendations.

Throughout this technical manual the designation for pipe threads is:-

- 'G' - Parallel pipe thread to BS.2779 & ISO.228/1 (formerly designated B.S.P. - Parallel)
- 'R' - Tapered pipe thread to BS.21 & ISO.7/1 (formerly designated B.S.P. - Taper)

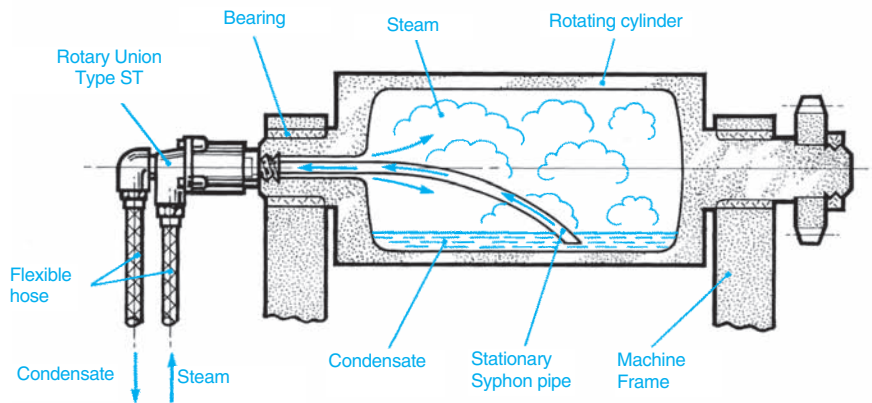
## Single flow - type B.E.



FILTON ROTARY UNIONS type B.E. shown on a drilled roll typical of a plastics calendar.

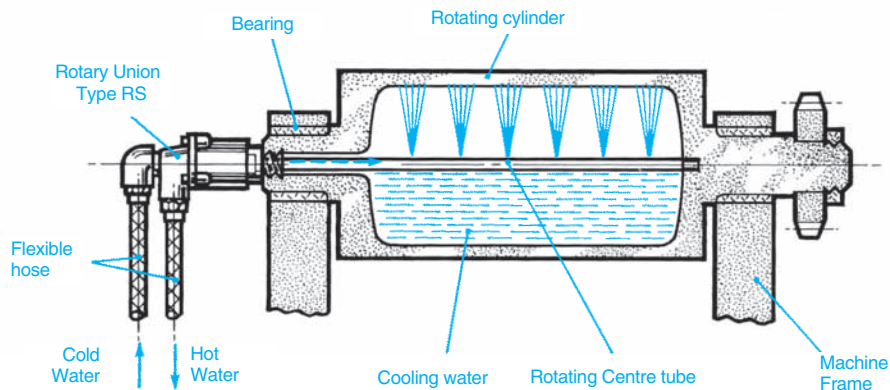
Fluids are generally water, oil or heat transfer fluid.

## Double flow - type S.T. (stationary centre tube)

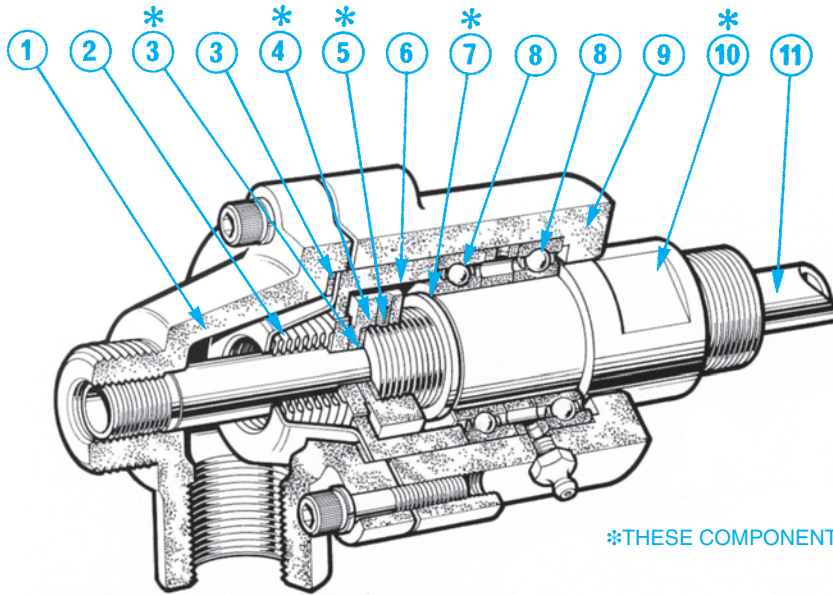


FILTON ROTARY UNION type S.T. shown on a steam heated cylinder typical of a paper dryer.

## Double flow - type R.S. (rotary centre tube)



FILTON ROTARY UNION type R.S. shown on a water cooled roll typical of a rubber mill.



**Rotary (R.E.) Union type S.T.**

1. Adaptor, high quality cast iron.
2. Bellows sub-assembly, brazed stainless steel.
3. Gaskets.
4. Seal ring sub-assembly, steel/carbon.
5. Locking screw, h.t. steel.
6. Spacer.
7. Circlip.
8. Ball bearings.
9. Body high quality cast iron.
10. Rotary spindle, steel.
11. Centre tube, if ordered, to customers specification.

\*THESE COMPONENTS ROTATE WITH THE MACHINE SHAFT

The Rotary (R.E.) Union is a self contained, self supporting rotary seal for the leak proof transfer of fluids (such as steam, water, air or oil) to and from rotating machine shafts.

The type of Rotary Seal fitted to the Rotary (R.E.) Union is a "FILTON BELLOWS SEAL" containing a flexible stainless steel bellows which is self adjusting, eliminating the maintenance common with conventional packed glands. Rotary sealing is created by relative rotation between extremely flat sealing faces (items 2 and 4) held in contact by the spring characteristic of the bellows with an additional sealing force created by pressure of the fluid passing through the Rotary (R.E.) Union. The bearings fitted to the Rotary (R.E.) Union are standard ball bearings which are given their initial lubrication before despatch.

There are 3 variations of the stationary Adaptor end, diagrams on page 5 and described below:-

### TYPE R.E./B.E.

This Rotary (R.E.) Union is a single flow unit and is suitable for transferring fluid in to or out of rotating machines. A typical application for this type is shown in page 3.

### TYPE R.E./S.T.

This Rotary (R.E.) Union is fitted with an Adaptor suitable for double flow with a stationary centre tube. This gives flow areas through the centre tube and annulus. Centre tubes are only provided if ordered. The centre tube is fixed to the Rotary (R.E.) Union end by means of a screw thread shown as dimension 'O'. Flow can pass in through the centre tube and return through the annulus or be reversed. For steam applications, a typical example of which is shown on page 3, the centre tube is curved to reach the condensate in the bottom of the cylinder. At times the roll neck diameter to length ratio prevents a curved tube being used, in such cases we can provide a Syphon Elbow details of which are on page 20.

### TYPE R.E./R.S.

The Adaptor fitted to this Rotary (R.E.) Union is suitable for a rotating centre tube, which must be located and driven by the machine. Centre tubes are only provided if ordered. For the type R.E./R.S. the centre tube rotates in a bush. The centre tube "sealing" system allows a slight internal leakage between the supply and return lines. If these fluids must not mix then an alternative design can be provided, please ask our Technical Department. Flow can pass in through the centre tube with the return through the annulus or be reversed. A typical application is shown on page 3.

## Operational Guidelines (For other conditions contact Filton Limited)

### FLUIDS

Water, steam, mineral oils, heat transfer fluids and compressed air (lubricated). All fluids should be clean and free from abrasive particles.

### PRESSURE

17 bar maximum.

### VACUUM

740 mm Hg. maximum (specify vacuum and we will test for this).

### TEMPERATURE

-20° to 180°C (with suitable effective lubrication 200°C).

### SPEED

1000 r.p.m. maximum up to 25(1") r.p.m. and 800 r.p.m. above.

\* Flow in cubic metres/hour at a velocity of 3 metres/second. Applies also to other liquids

† Flow in kilograms/hour at a velocity of 30 metres/second and a pressure of 6 bar.

★ Flow in cubic metres/hour free air at a velocity of 15 metres/second and a pressure bar of 6 bar.

### FLOW CAPACITY

Nominal Size	Type	FLOW CAPACITY			
		Water* m <sup>3</sup> /h	l/min	Steam† kg/h	Air★ m <sup>3</sup> /h
8 (1/4")	B.E.	0.3	5	11	11
	S.T. & R.S.	0.05	0.8	3.4	2
10 (3/8")	B.E.	0.8	13.3	31	29
	S.T. & R.S.	0.1	1.7	16	4
15 (1/2")	B.E.	1.7	28.3	61	58
	S.T. & R.S.	0.3	5	27	10
20 (3/4")	B.E.	2.7	45	101	96
	S.T. & R.S.	0.6	10	41	22
25 (1")	B.E.	4.1	68.3	151	144
	S.T. & R.S.	1.8	30	56	44
32 (1 1/4")	B.E.	7.6	127	280	267
	S.T. & R.S.	2.1	35	133	74

IT IS NOT ADVISABLE TO COMBINE MAXIMUMS

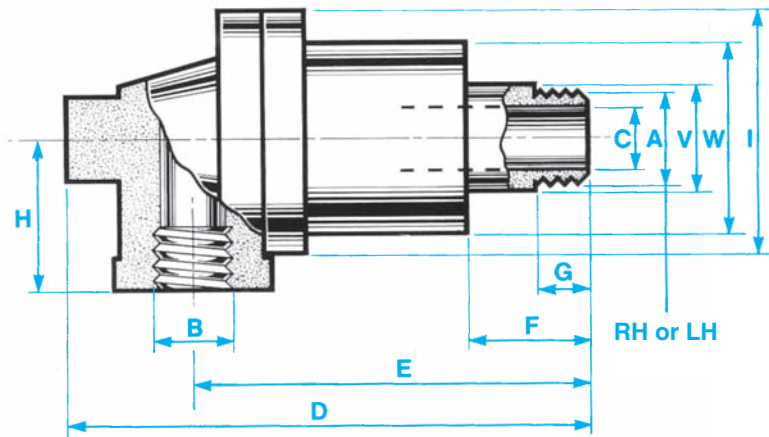


# ROTARY (R.E.) UNIONS



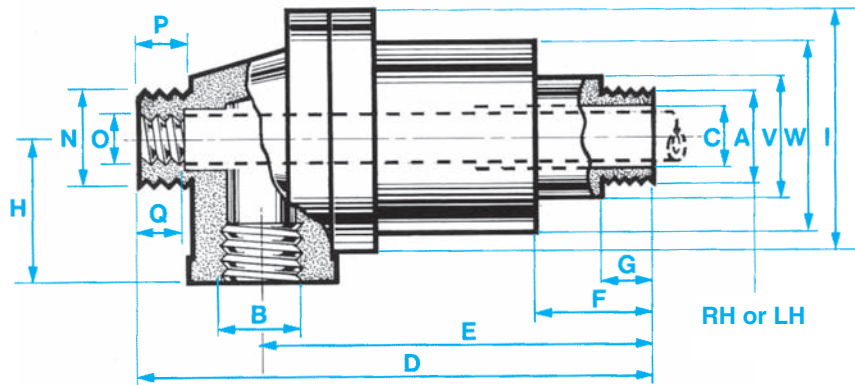
## For single flow type R.E./B.E.

Nominal Size	Part No.	R or L
8 (1/4")	14642	R or L
10 (3/8")	14636	R or L
15 (1/2")	14536	R or L
20 (3/4")	14460	R or L
25 (1")	14396	R or L
32 (1 1/4")	14377	R or L



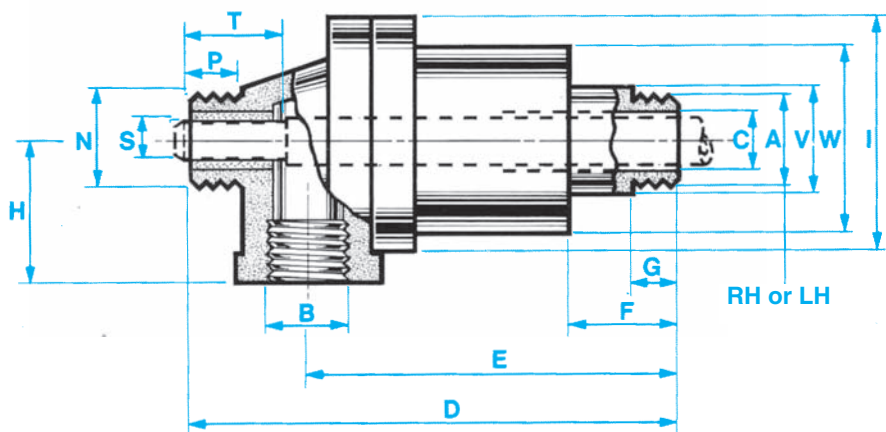
## For double flow (stationary centre tube) type R.E./S.T.

Nominal Size	Part No.	R or L
8 (1/4")	14643M	R or L
10 (3/8")	14637M	R or L
15 (1/2")	14535	R or L
20 (3/4")	14534	R or L
25 (1")	14542	R or L
32 (1 1/4")	14379	R or L



## For double flow (rotary centre tube) type R.E./R.S.

Nominal Size	Part No.	R or L
8 (1/4")	17196	R or L
10 (3/8")	17197	R or L
15 (1/2")	16657	R or L
20 (3/4")	16659	R or L
25 (1")	16661	R or L
32 (1 1/4")	16663	R or L



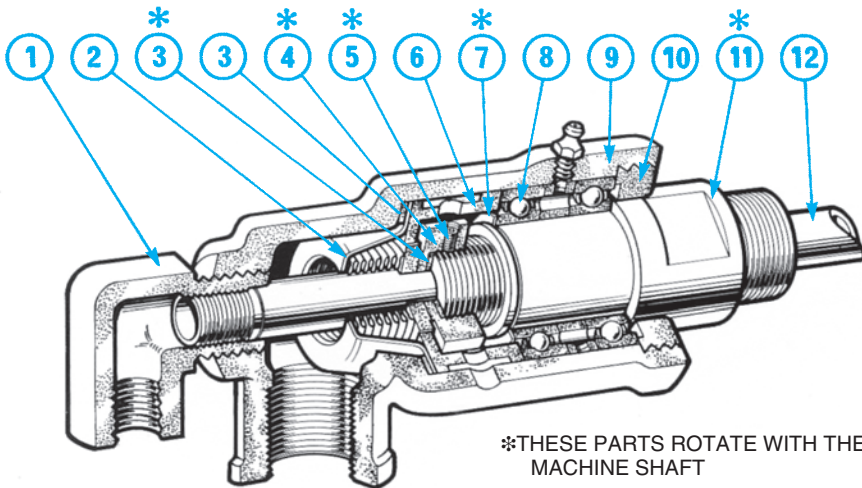
Dimensions in millimetres

Nominal Size	A B & N	C	D	E	F	G & P	H	I	O	Q	S	T	V	W
8 (1/4")	G.1/4"	6	117	94	22	11	30	57	M5 x 0.8	6	4.75/ 4.72	25	24	44
10 (3/8")	G.3/8"	10	121	97	25	13	30	57	M6 x 1.0	6	6.35/ 6.32	25	24	44
15 (1/2")	G.1/2"	13	167	130	29	16	44	83	G.1/8"	6	9.52/ 9.50	40	38	63
20 (3/4")	G.3/4"	18	173	133	32	19	44	83	G.1/4"	10	12.70/ 12.67	40	38	63
25 (1")	G.1"	22	197	149	48	22	54	105	G.3/8"	10	15.87/ 15.85	45	43	83
32 (1 1/4")	G.1 1/4"	30	227	170	51	25	70	121	G.1/2"	13	19.05/ 19.02	50	55	95

'G' is the designation for parallel pipe threads to BS.2779 and ISO 228/1

SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS

## Rotary (P.B.) Union type S.T. (fitted with a bellows seal)



1. Elbow, brass.
2. Bellows sub-assembly, brazed stainless steel.
3. Gaskets.
4. Seal ring sub-assembly, steel/carbon.
5. Locking screw, h.t. steel.
6. Spacer.
7. Circlip.
8. Ball bearings.
9. Body, dZR brass.
10. Locking ring.
11. Rotary spindle, steel
12. Centre tube, if ordered, to customers specification.

Mechanical Seals are also available.  
(add MS to the Part No)

The Rotary (P.B.) Union has been developed from the Rotary (R.E.) Union and utilises the same well-proven and highly successful bellows seal and bearing system. The body is manufactured from de-zincification resistant brass which has advantages over conventional brass and the cast iron adaptor of the Rotary (R.E.) Union on many water cooling applications. There are three types available which are shown in the diagrams on page 7 and described below (add MS to the Part No.).

### TYPE P.B./B.E.

This Rotary (P.B.) Union is a single flow unit and is suitable for transferring fluids into or out of rotating machine shafts. The body is fitted with a plug at the outboard end which allows this type to be converted to P.B./S.T. or P.B./R.S. by using the appropriate elbow. A typical application is shown on page 3.

### TYPE P.B./S.T.

This Rotary (P.B.) Union is fitted with an elbow suitable for double flow with a stationary centre tube. This gives flow areas through the centre tube and annulus. Centre tubes are only provided if ordered. The centre tube is fixed to the Rotary (P.B.) Union end by means of a screw thread shown as dimension 'O'. Flow can pass in through the centre tube and return through the annulus or be reversed.

For steam applications, a typical example of which is shown on page 3, the centre tube is curved to reach the condensate in the bottom of the cylinder. At times the roll neck diameter to length ratio prevents a curved tube being used, in such cases we can provide a Syphon Elbow details of which are on page 20.

### TYPE P.B./R.S.

The elbow fitted to this Rotary (P.B.) Union is suitable for a rotating centre tube, which must be located and driven by the machine. Centre tubes are only provided if ordered. The centre tube rotates in a labyrinth bush. The centre tube "sealing" system allows a slight internal leakage between the supply and return lines. If these fluids must not mix then an alternative design can be provided, please ask our Technical Department. Flow can pass-in through the centre tube with the return through the annulus or be reversed. A typical application is shown on page 3.

## Operational Guidelines (For other conditions contact Filton Limited)

### FLUIDS

Water, mineral oils and compressed air (lubricated). All fluids should be clean and free from abrasive particles.

### PRESSURE

17 bar maximum

### VACUUM

740 mm Hg. maximum (specify vacuum and we will test for this).

### TEMPERATURE

-20° to 160°C

### SPEED

1000 r.p.m. maximum with the bellows seal, 1500 r.p.m. maximum with the mechanical seal.

### FLOW CAPACITY

Nominal Size	Type	Water*		Air*
		m <sup>3</sup> /h	l/min	
15 (1/2")	B.E.	1.7	28.3	58
	S.T. & R.S.	0.3	5	10
20 (3/4")	B.E.	2.7	45	96
	S.T. & R.S.	0.6	10	22
25 (1")	B.E.	4.1	68.3	144
	S.T. & R.S.	1.8	30	44

\* Flow in cubic metres/hour at a velocity of 3 metres/second.  
Applies also to other liquids.

★ Flow in cubic metres/hour free air at a velocity of 15 metres/second and a pressure of 6 bar.

IT IS NOT ADVISABLE TO COMBINE MAXIMUMS

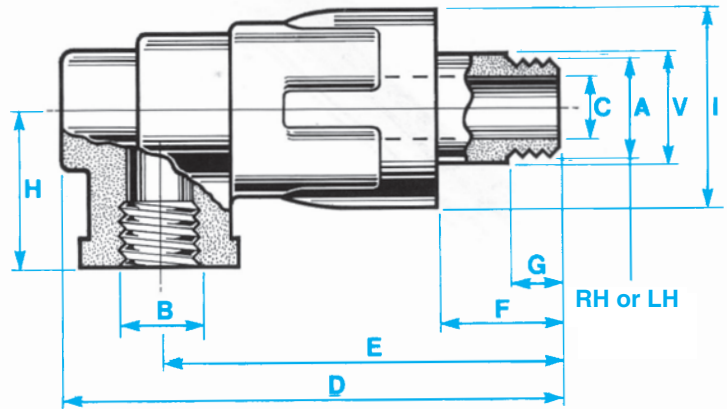
# ROTARY (P.B.) UNIONS



The part numbers shown are for units fitted with the bellows seal. Add suffix MS if a mechanical seal is required.

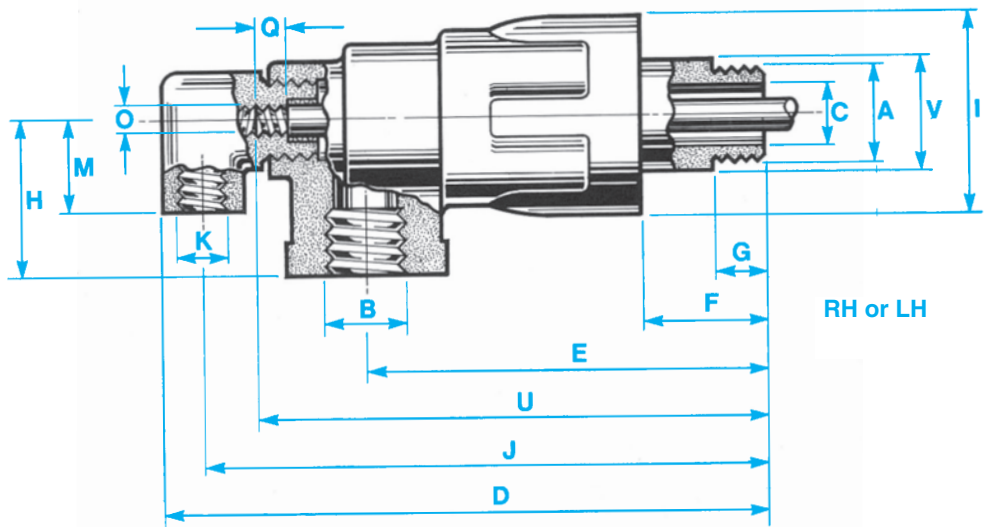
## For single flow type P.B./B.E.

Nom size	A	Part No	
15 (1/2")	G1/2"	18466	R or L
	3/4" - 16 UNF	18466U	R or L
	M22 x 1.5	18466MB	R or L
20 (3/4")	G3/4"	18469	R or L
	1" - 14 UNS	18469U	R or L
	M30 x 1.5	18469MB	R or L
25 (1")	G1"	18472	R or L
	1 1/2" - 12 UNF	18472U	R or L
	M35 x 1.5	18472MB	R or L



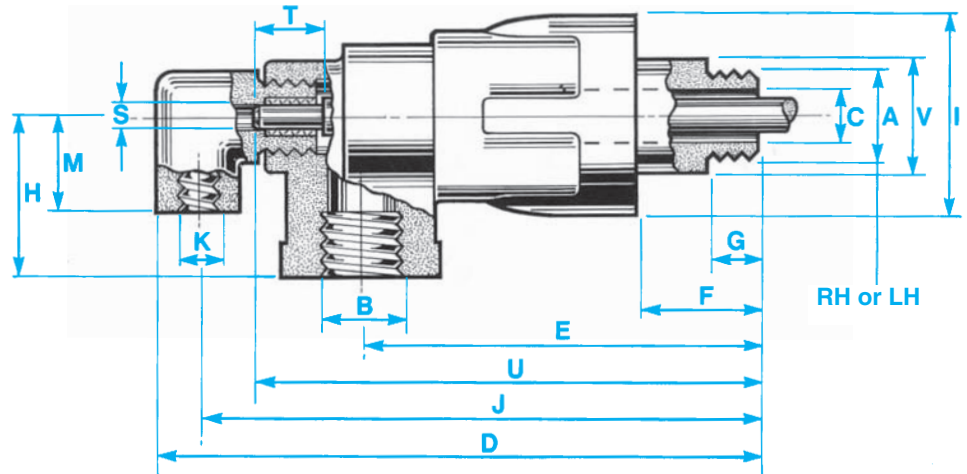
## For double flow (stationary centre tube) type P.B./S.T.

Nom size	A	Part No	
15 (1/2")	G1/2"	18467	R or L
	3/4" - 16 UNF	18467U	R or L
	M22 x 1.5	18467MB	R or L
20 (3/4")	G3/4"	18470	R or L
	1" - 14 UNS	18470U	R or L
	M30 x 1.5	18470MB	R or L
25 (1")	G1"	18473	R or L
	1 1/2" - 12 UNF	18473U	R or L
	M35 x 1.5	18473MB	R or L



## For double flow (rotary centre tube) type P.B./R.S.

Nom size	A	Part No	
15 (1/2")	G1/2"	18468	R or L
	3/4" - 16 UNF	18468U	R or L
	M22 x 1.5	18468MB	R or L
20 (3/4")	G3/4"	18471	R or L
	1"-14 UNS	18471U	R or L
	M30 x 1.5	18471MB	R or L
25 (1")	G1"	18474	R or L
	1 1/2" - 12 UNF	18474U	R or L
	M35 x 1.5	18474MB	R or L



Dimensions in millimetres

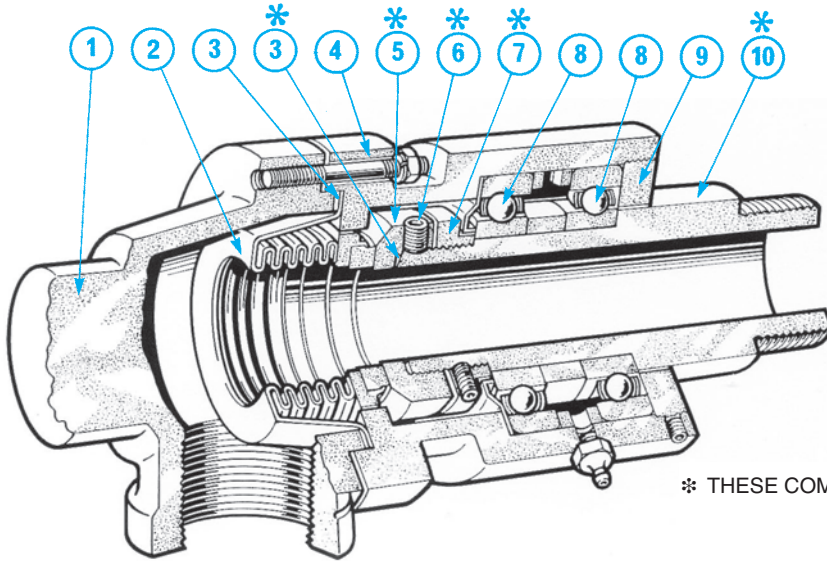
Nominal size	B	C	D	D B.E.	D S.T. & R.S.	E	F	G	H	I	J	K	M	O	Q	S	T	U S.T.	U R.S.	V
15 (1/2")	G1/2"	13	159	193	130	29	16	44	68	181	G1/4"	30	G1/8"	12	9.52/9.50	20	173	166	38	
20 (3/4")	G3/4"	18	162	196	133	32	19	44	68	184	G1/4"	30	G1/4"	12	12.70/12.67	20	176	169	38	
25 (1")	G1"	22	180	210	148	43	22	52	88	197	G3/8"	25	G3/8"	9.5	15.87/15.85	25	185	185	42	

For dimension 'A' see the part No tables above

'G' is the designation for parallel pipe threads to BS.2779 and ISO.228/1

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**





**Rotary (R.E.B.) Union type B.E.**

1. Adaptor, s.g. iron.
2. Bellows sub-assy, brazed stainless steel/carbon.
3. Gaskets.
4. Body, s.g. iron.
5. Seal ring, hardened stainless steel.
6. Locking screws, h.t. steel.
7. Locking ring-inner.
8. Ball bearings—shielded from the seal chamber.
9. Locking ring-outer.
10. Rotary spindle, steel.

※ THESE COMPONENTS ROTATE WITH THE SHAFT

The Rotary (R.E.B.) Union is a self contained, self supporting rotary seal for the leak proof transfer of fluids (such as steam, water, air or oil) to and from rotating machine shafts.

The type of Rotary Seal fitted to the Rotary (R.E.B.) Union is a "FILTON BELLOWS SEAL" containing a flexible stainless steel bellows which is self adjusting, eliminating the maintenance common with conventional packed glands.

Rotary sealing is created by relative rotation between extremely flat sealing faces (items 2 and 5) held in contact by the spring characteristics of the bellows with an additional sealing force created by pressure of the fluid passing through the Rotary (R.E.B.) Union.

The bearings fitted to the Rotary (R.E.B.) Union are standard ball bearings which are given their initial lubrication after assembly. A shield is fitted to the seal chamber side of the ball bearings.

There are 3 variations of the stationary Adaptor end, diagrams on page 9 and described below:-

**TYPE R.E.B./B.E.**

This is a single flow unit and is suitable for transferring fluid in to or out of rotating machines. A typical application for this type is shown in page 3.

**TYPE R.E.B./S.T**

This Rotary (R.E.B.) Union is fitted with an Adaptor suitable for double flow with a stationary centre tube. This gives flow areas through the centre tube and annulus. Centre tubes are only provided if ordered. The centre tube is fixed to the Rotary (R.E.B.) Union end by means of a screw thread shown as dimension 'O'. Flow can pass in through the centre tube and return through the annulus or be reversed. For steam applications, a typical example of which is shown on page 3, the centre tube is curved to reach the condensate in the bottom of the cylinder. At times the roll neck diameter to length ratio prevents a curved tube being used, in such cases we can provide a Syphon Elbow details of which are on page 20.

**TYPE R.E.B./R.S.**

The Adaptor fitted to this Rotary (R.E.B.) Union is suitable for a rotating centre tube, which must be located and driven by the machine. Centre tubes are only provided if ordered. The centre tube rotates in a carbon bush. The centre tube "sealing" system allows a slight internal leakage between the supply and return lines. If these fluids must not mix then an alternative design can be provided. Please ask our Technical Department. Flow can pass-in through the centre tube with the return through the annulus or be reversed. A typical application is shown on page 3.

**Operational Guidelines** (For other conditions contact Filton Limited)

**FLUIDS**

Water, steam, mineral oils, heat transfer fluids and compressed air (lubricated). All fluids should be clean and free from abrasive particles.

**PRESSURE**

- Water, steam and mineral oil - 17 bar maximum.
- Heat transfer fluid - 17 bar maximum (5" and 6" 13 bar maximum.)
- Compressed air - 1 1/2" & 2" - 17 bar maximum
- 2 1/2" & 3" - 12.5 bar maximum
- 3 1/2" & 4" - 10 bar maximum
- 5" & 6" - On application

**VACUUM**

740 mm Hg. maximum (specify vacuum and we will test for this).

**TEMPERATURE**

- 20° to 180°C (with suitable effective lubrication 200°C).
- 20° to 120°C for sizes 125 (5") and 150 (6").

**SPEED**

- 600 r.p.m. maximum up to 50 (2") size, 500 r.p.m. for 65 (2 1/2") and 80 (3"), 400 r.p.m. for 90 (3 1/2") and 100 (4") and 300 r.p.m. for 125 (5") and 150 (6").

\* Flow in Cubic metres/hour at a velocity of 3 metres/second. Applies also to other liquids

† Flow in kilograms/hour at a velocity of 30 metres/second and a pressure of 6 bar.

★ Flow in cubic metres/hour free air at a velocity of 15 metres/second and a pressure of 6 bar.

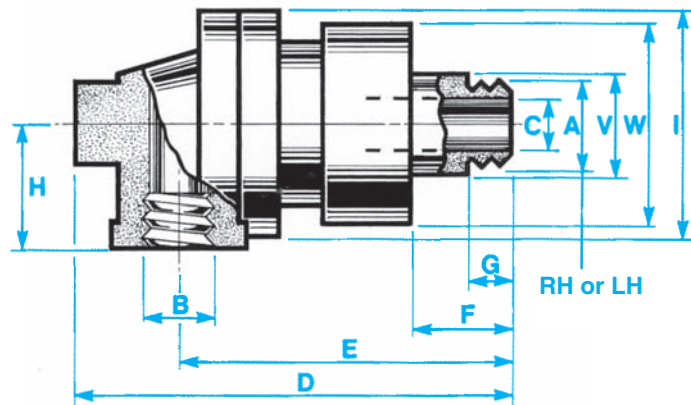
**FLOW CAPACITY**

Nominal Size	Type	Water*		Steam†	Air★
		m <sup>3</sup> /h	l/min		
40 (1 1/2")	B.E.	10.4	173	381	364
	S.T. & R.S.	3.8	63	151	135
50 (2")	B.E.	19.5	325	717	684
	S.T. & R.S.	6.3	105	357	215
65 (2 1/2")	B.E.	30.5	508	1120	1069
	S.T. & R.S.	10.8	180	547	376
80 (3")	B.E.	41.6	693	1524	1455
	S.T. & R.S.	14.9	248	807	511
90 (3 1/2")	B.E.	57.0	950	2091	1996
	S.T. & R.S.	23.4	390	942	818
100 (4")	B.E.	76.6	1277	2807	2679
	S.T. & R.S.	27.6	460	982	937
125 (5")	B.E.	112.2	1870	4859	4639
	S.T. & R.S.	45.3	755	1617	1544
150 (6")	B.E.	166.3	2772	6997	6680
	S.T. & R.S.	73.7	1228	2892	2760

**IT IS NOT ADVISABLE TO COMBINE MAXIMUMS**

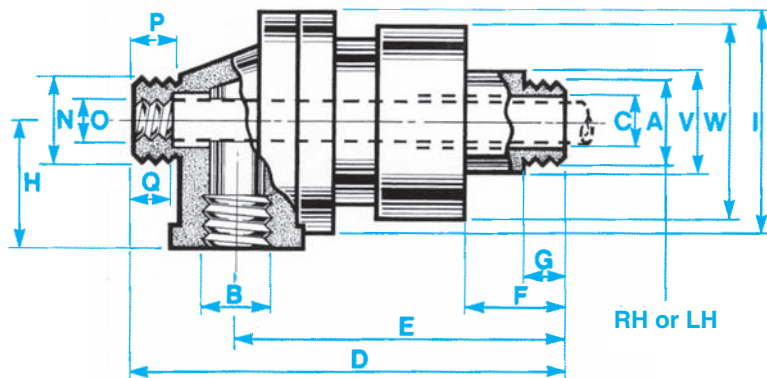
## For single flow type R.E.B./B.E.

Normal Size	Part No.	R or L
40 (1 1/2")	18104	R or L
50 (2")	17350	R or L
65 (2 1/2")	18131	R or L
80 (3")	17265	R or L
90 (3 1/2")	17421	R or L
100 (4")	17424	R or L
125 (5")	17634.SF	R or L
150 (6")	17637.SF	R or L



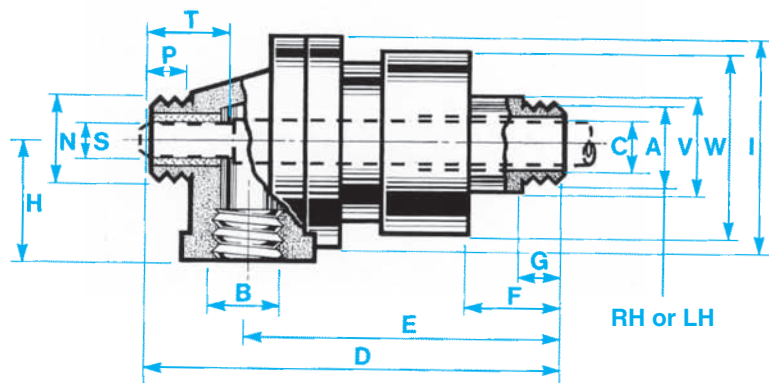
## For double flow (stationary centre tube) type R.E.B./S.T.

Nominal Size	Part No.	R or L
40 (1 1/2")	18105	R or L
50 (2")	17238	R or L
65 (2 1/2")	18132	R or L
80 (3")	17266	R or L
90 (3 1/2")	17422	R or L
100 (4")	17425	R or L
125 (5")	17635.SF	R or L
150 (6")	17638.SF	R or L



## For double flow (rotary centre tube) type R.E.B./R.S.

Nominal Size	Part No.	R or L
40 (1 1/2")	18106	R or L
50 (2")	17351	R or L
65 (2 1/2")	18133	R or L
80 (3")	17263	R or L
90 (3 1/2")	17423	R or L
100 (4")	17426	R or L
125 (5")	17636.SF	R or L
150 (6")	17639.SF	R or L



Dimensions in millimetres

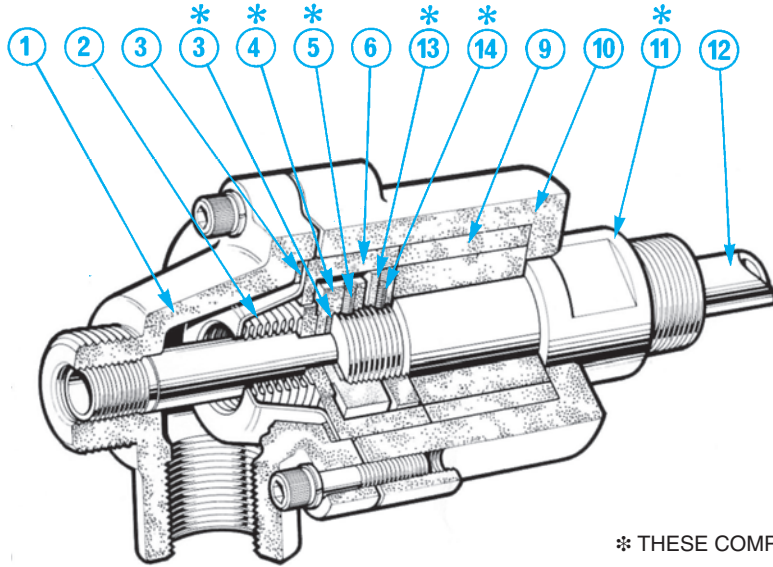
Nominal Size	A	B & N	C	D	E	F	G & P	H	I	O	Q	S*	T	V	W
40(1 1/2")	G.1 1/2"	G.1 1/2"	35	268	212	52	25	72	128	G.3/4"	14	25.4,f8	50	64	108
50(2")	G.2"	G.2"	48	293	226	55	28	83	137	G.1"	19	31.8,f8	60	76	127
65(2 1/2")	G.2 1/2"	G.2 1/2"	57	357	279	67	30	102	186	G.1 1/4"	25	40,f8	55	90	150
80(3")	G.3"	G.3"	70	409	324	77	30	120	200	G.1 1/2"	25	45,f8	70	110	180
90(3 1/2")	G.3 1/2"	G.4"	82	519	406	95	40	130	250	G.2"	30	60,f8	60	140	240
100(4")	G.4"	G.4"	95	519	406	95	40	130	250	G.2 1/2"	30	75,f8	60	140	240
125(5")	● G.5"	G.5"	115	688	543	115	45	167	325	G.3"	40	88,f8	70	192	290
150(6")	● G.6"	G.6"	140	688	543	115	45	167	325	G.3 1/2"	40	100,f8	70	192	290

● Flanged, see page 23.

\* The tolerance f8 is to I.S.O. 286-2 and BS.EN 20286-2

'G' is the designation for parallel pipe threads to BS.2779 and ISO 228/1.

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**



## Rotary (C.B.) Union type S.T.

1. Adaptor, high quality cast iron.
2. Bellows sub-assembly, brazed stainless steel.
3. Gaskets.
4. Seal ring sub-assembly, steel/carbon.
5. Locking screw, h.t. steel.
6. Spacer.
9. Bearing sub-assembly, steel/carbon.
10. Body, high quality cast iron.
11. Rotary spindle, steel.
12. Centre tube, if ordered, to your specification.
13. Thrust Pad, stainless steel.
14. Set screw, h.t. steel.

\* THESE COMPONENTS ROTATE WITH THE MACHINE SHAFT

The Rotary (C.B.) Union is a self contained, self supporting rotary seal for the leak proof transfer of fluids (such as steam, hot water or oil) to and from rotating machine shafts.

The type of Rotary Seal fitted to the Rotary (C.B.) Union is a "FILTON BELLOWS SEAL" containing a flexible stainless steel bellows which is self adjusting, eliminating the maintenance common with conventional packed glands. Rotary sealing is created by relative rotation between extremely flat sealing faces (items 2 and 4) held in contact by the spring characteristics of the bellows with an additional sealing force created by pressure of the fluid passing through the Rotary (C.B.) Union. The bearing fitted to the Rotary (C.B.) Union is a cylindrical carbon combined journal and thrust bearing in which a hard chromed and ground spindle rotates.

There are 3 variations of the stationary Adaptor end, diagrams on page 11 and described below:-

### TYPE C.B./B.E.

This is a single flow unit and is suitable for transferring fluid in to or out of rotating machines. A typical application is shown on page 3.

### TYPE C.B./S.T.

This Rotary (C.B.) Union is fitted with an Adaptor suitable for double flow with a stationary centre tube. This gives flow areas through the centre tube and annulus. Centre tubes are only provided if ordered. The centre tube is fixed to the Rotary (C.B.) Union end by means of a screw thread shown as dimension 'O'. Flow can pass in through the centre tube and return through the annulus or be reversed.

For steam applications, a typical example of which is shown on page 3, the centre tube is curved to reach the condensate in the bottom of the cylinder. At times the roll neck diameter to length ratio prevents a curved tube being used, in such cases we can provide a Syphon Elbow details of which are on page 20.

### TYPE C.B./R.S.

The Adaptor fitted to this Rotary (C.B.) Union is suitable for a rotating centre tube, which must be located and driven by the machine. Centres tubes are only provided if ordered. The centre tube rotates in a bush. The centres tube "sealing" system allows a slight internal leakage between the supply and return lines. If these fluids must not mix then an alternative design can be provided. Please ask our Technical Department. Flow can pass through the centre tube with the return through the annulus or be reversed. A typical application is shown on page 3.

## Operational Guidelines (For other conditions contact Filton Limited)

### FLUIDS

Water, steam, mineral oils and heat transfer fluids (but use flanged connections when the temperature exceeds 180°C). All fluids should be clean and free from abrasive particles.

### PRESSURE

17 bar maximum.

### TEMPERATURE

100°C to 300°C (lower temperatures dependant on other conditions).

### SPEED

500 r.p.m. maximum up to 25(1") size and 400 r.p.m. for 32 (1 1/4").

### FLOW CAPACITY

Nominal Size	Type	Water*		Steam† kg/h
		m <sup>3</sup> /h	l/min	
8 (1/4")	B.E.	0.3	5	11
	S.T. & R.S.	0.05	0.8	3.4
10 (3/8")	B.E.	0.8	13.3	31
	S.T. & R.S.	0.1	1.7	16
15 (1/2")	B.E.	1.7	28.3	61
	S.T. & R.S.	0.3	5	27
20 (3/4")	B.E.	2.7	45	101
	S.T. & R.S.	0.6	10	41
25 (1")	B.E.	4.1	68.3	151
	S.T. & R.S.	1.8	30	56
32 (1 1/4")	B.E.	7.6	127	280
	S.T. & R.S.	2.1	35	133

\* Flow in cubic metres/hour at a velocity of 3 metres/second. Applies also to other liquids.

† Flow in kilograms/hour at a velocity of 30 metres/second and a pressure of 6 bar.

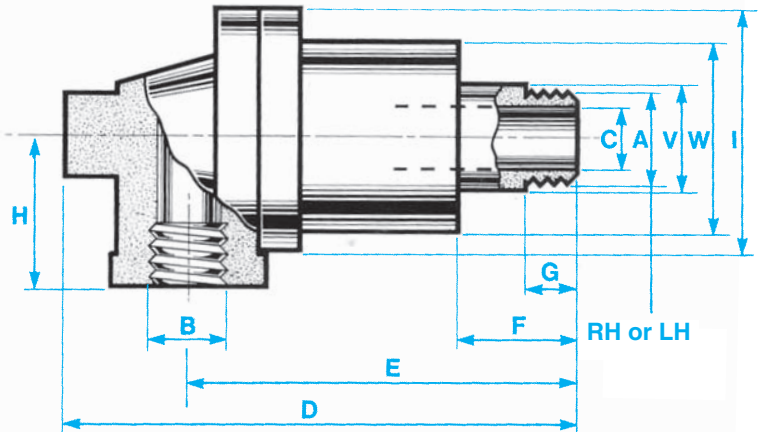
IT IS NOT ADVISABLE TO COMBINE MAXIMUMS

# ROTARY (C.B.) UNIONS



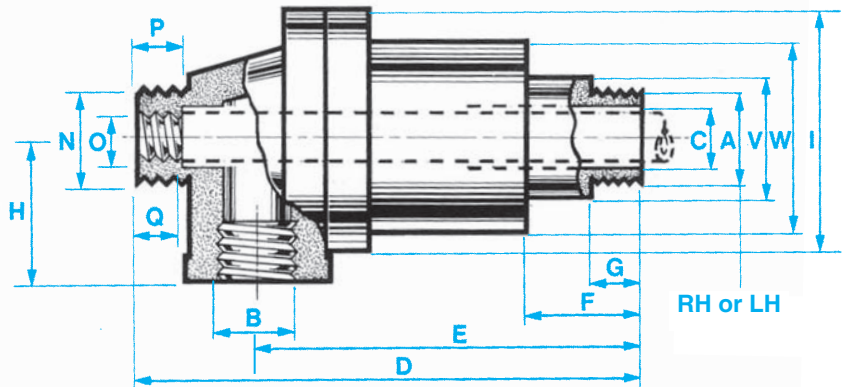
## For single flow type C.B./B.E.

Nominal Size	Part No.	
8 (1/4")	14645	R or L
10 (3/8")	14639	R or L
15 (1/2")	14554	R or L
20 (3/4")	14524	R or L
25 (1")	14545	R or L
32 (1 1/4")	14546	R or L



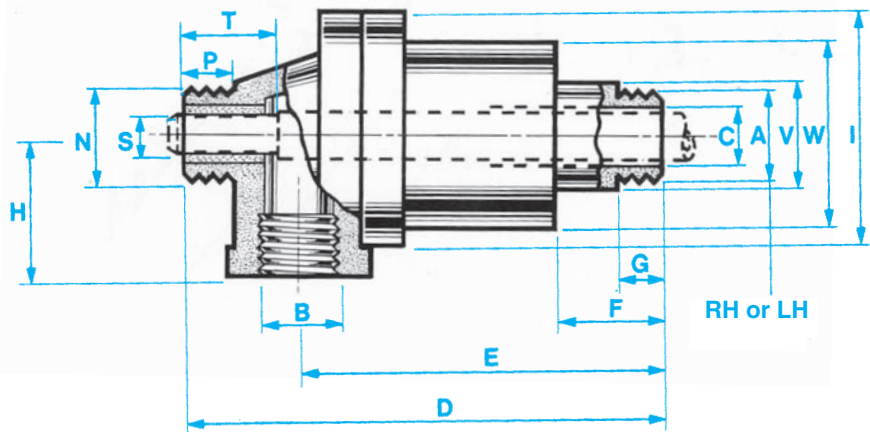
## For double flow (stationary centre tube) type C.B./S.T.

Nominal Size	Part No.	
8 (1/4")	14646M	R or L
10 (3/8")	14640M	R or L
15 (1/2")	14525	R or L
20 (3/4")	14523	R or L
25 (1")	14386	R or L
32 (1 1/4")	14488	R or L



## For double flow (rotary centre tube) type C.B./R.S.

Nominal Size	Part No.	
8 (1/4")	17215	R or L
10 (3/8")	17216	R or L
15 (1/2")	16658	R or L
20 (3/4")	16660	R or L
25 (1")	16662	R or L
32 (1 1/4")	16664	R or L



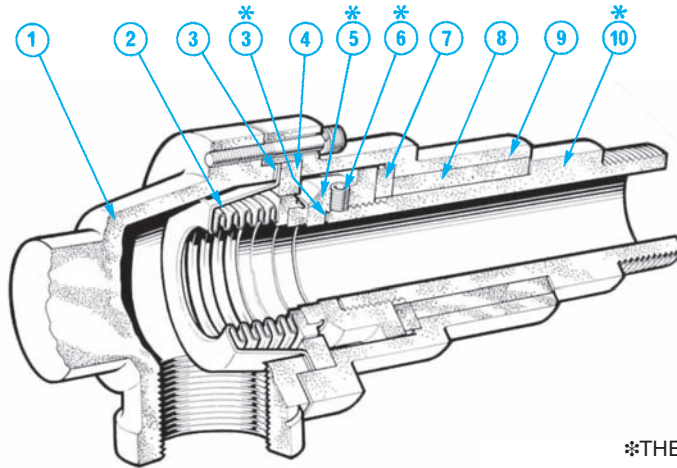
Dimensions in millimetres

Nominal Size	A B & N	C	D	E	F	G & P	H	I	O	Q	S	T	V	W
8 (1/4")	G.1/4"	6	117	94	22	11	30	57	M5 x 0.8	6	4.75/ 4.72	25	24	44
10 (3/8")	G.3/8"	10	121	97	25	13	30	57	M6 x 1.0	6	6.35/ 6.32	25	24	44
15 (1/2")	G.1/2"	13	167	130	29	16	44	83	G.1/8"	6	9.52/ 9.50	40	38	63
20 (3/4")	G.3/4"	18	173	133	32	19	44	83	G.1/4"	10	12.70/ 12.67	40	38	63
25 (1")	G.1"	22	210	162	48	22	54	105	G.3/8"	10	15.87/ 15.85	45	43	83
32 (1 1/4")	G.1 1/4"	30	238	181	51	25	70	121	G.1/2"	13	19.05/ 19.02	50	55	95

'G' is the designation for parallel pipe threads to BS.2779 and ISO 228/1.

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**





## Rotary (C.B.N.) Union type B.E.

1. Adaptor, s.g. iron.
2. Bellows sub-assembly brazed stainless steel/carbon.
3. Gaskets.
4. Spacer, plated steel.
5. Seal ring, hardened stainless steel.
6. Locking screw, h.t. steel.
7. Thrust bearing, carbon.
8. Journal bearing, carbon.
9. Body, s.g. iron.
10. Rotary spindle, steel.

\*THESE COMPONENTS ROTATE WITH THE SHAFT

The Rotary (C.B.N.) Union is a self contained, self supporting rotary seal for the leak proof transfer of fluids (such as steam, hot water or oil) to and from rotating machine shafts.

The type of Rotary Seal fitted to the Rotary (C.B.N.) Union is a "FILTON BELLOWS SEAL" containing a flexible stainless steel bellows which is self adjusting, eliminating the maintenance common with conventional packed glands.

Rotary sealing is created by relative rotation between extremely flat sealing faces (items 2 and 5) held in contact by the spring characteristic of the bellows with an additional sealing force created by pressure of the fluid passing through the Rotary (C.B.N.) Union.

The bearings fitted to the Rotary (C.B.N.) Union are separate carbon thrust and journal bearings in which a hard chromed and ground spindle rotates.

There are 3 variations of the stationary Adaptor end, diagrams on page 13 and described below:—

### TYPE C.B.N./B.E.

This is a single flow unit and is suitable for transferring fluid in to or out of rotating machines shafts. A typical application for this type is shown on page 3.

### TYPE C.B.N./S.T.

This Rotary (C.B.N.) Union is fitted with an Adaptor suitable for double flow with a stationary centre tube. This gives flow areas through the centre tube and annulus. Centre tubes are only provided if ordered. The centre tube is fixed to the Rotary (C.B.N.) Union end by means of a screw thread shown as dimension 'O'. Flow can pass in through the centre tube and return through the annulus or be reversed.

For steam applications, a typical example of which is shown on page 3, the centre tube is curved to reach the condensate in the bottom of the cylinder. At times the roll neck diameter to length ratio prevents a curved tube being used, in such cases we can provide a Syphon Elbow, details of which are on page 20.

### TYPE C.B.N./R.S.

The Adaptor fitted to this Rotary (C.B.N.) Union is suitable for a rotating centre tube, which must be located and driven by the machine. Centre tubes are only provided if ordered. The centre tube rotates in a carbon bush. The centre tube "sealing" system allows a slight internal leakage between the supply and return lines. If these fluids must not mix then an alternative design can be provided. Please ask our Technical Department. Flow can pass in through the centre tube with the return through the annulus or be reversed. A typical application is shown on page 3.

## Operational Guidelines (For other conditions contact Filton Limited)

### FLUIDS

Hot water, steam, mineral oils, heat transfer fluids (but use flanged connections when the temperature exceeds 180°C).

All fluids should be clean and free from abrasive particles.

### PRESSURE

Water, steam and mineral oil - 17 bar maximum.

Heat transfer fluid - 17 bar maximum (5" and 6" 13 bar maximum.)

### TEMPERATURE

100°C to 300°C (lower temperatures dependant on other conditions).

### SPEED

300 r.p.m. maximum up to 50 (2") size, 250 r.p.m. for 65 (2½") and 80 (3"), 200 r.p.m. 90 (3½") and 100 (4"), and 150 r.p.m. for 125 (5") and 150 (6").

\* Flow in cubic metres/hour at a velocity of 3 metres/second. Applies also to other liquids.

† Flow in kilograms/hour at a velocity of 30 metres/second and a pressure of 6 bar.

### FLOW CAPACITY

Nominal Size	Type	Water*		Steam† kg/h
		m³/h	l/min	
40 (1½")	B.E.	10.4	173	381
	S.T. & R.S.	3.8	63	151
50 (2")	B.E.	19.5	325	717
	S.T. & R.S.	6.3	105	357
65 (2½")	B.E.	30.5	508	1120
	S.T. & R.S.	10.8	180	547
80 (3")	B.E.	41.6	693	1524
	S.T. & R.S.	14.9	248	807
90 (3½")	B.E.	57.0	950	2091
	S.T. & R.S.	23.4	390	942
100 (4")	B.E.	76.6	1277	2807
	S.T. & R.S.	27.6	460	982
125 (5")	B.E.	112.2	1870	4859
	S.T. & R.S.	45.3	755	1617
150 (6")	B.E.	166.3	2772	6997
	S.T. & R.S.	73.7	1228	2892

IT IS NOT ADVISABLE TO COMBINE MAXIMUMS



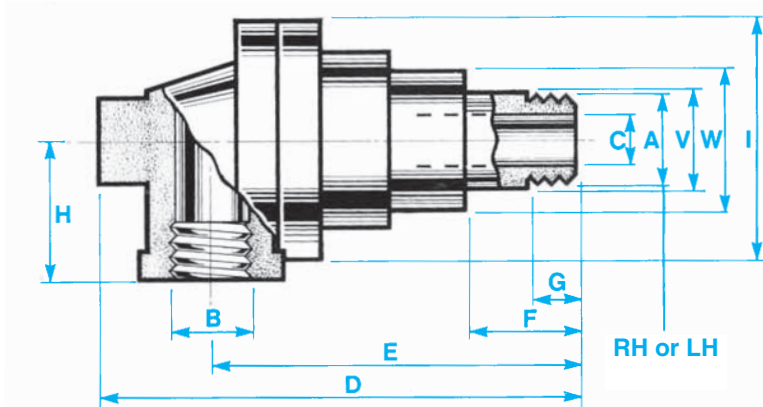
# ROTARY (C.B.N.) UNIONS



Specify R or L with the part No to suit thread 'A' and the direction of rotation

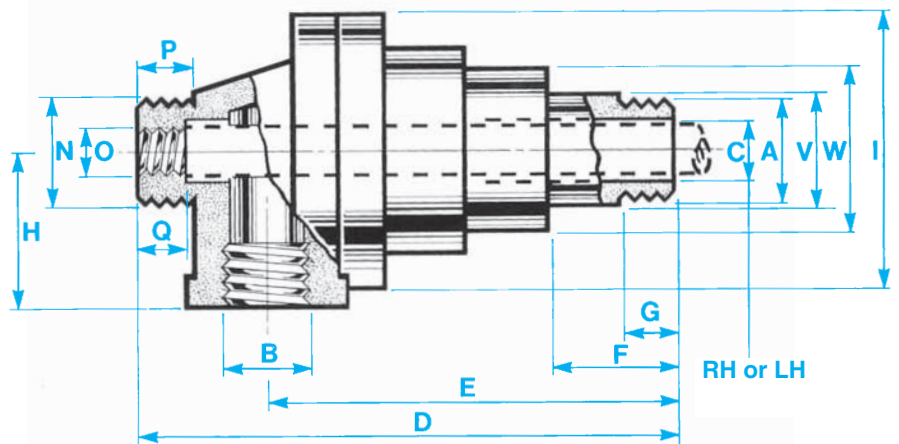
## For single flow type C.B.N./B.E.

Nominal Size	Part No.	R or L
40 (1 1/2")	18101	R or L
50 (2")	15471	R or L
65 (2 1/2")	18240	R or L
80 (3")	15477	R or L
90 (3 1/2")	16171	R or L
100 (4")	16174	R or L
125 (5")	15486.SF	R or L
150 (6")	16704.SF	R or L



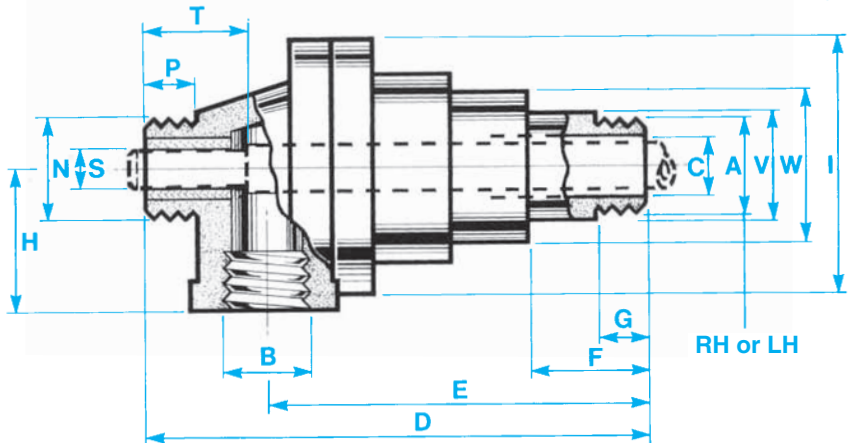
## For double flow (stationary centre tube) type C.B.N./S.T.

Nominal Size	Part No.	R or L
40 (1 1/2")	18102	R or L
50 (2")	15472	R or L
65 (2 1/2")	18241	R or L
80 (3")	15478	R or L
90 (3 1/2")	16172	R or L
100 (4")	16175	R or L
125 (5")	15487.SF	R or L
150 (6")	16703.SF	R or L



## For double flow (rotary centre tube) type C.B.N./R.S.

Nominal Size	Part No.	R or L
40 (1 1/2")	18103	R or L
50 (2")	15473	R or L
65 (2 1/2")	18242	R or L
80 (3")	15479	R or L
90 (3 1/2")	16173	R or L
100 (4")	16176	R or L
125 (5")	15488.SF	R or L
150 (6")	16702.SF	R or L



Dimensions in millimetres

Nominal Size	A	B & N	C	D	E	F	G & P	H	I	O	Q	S*	T	V	W
40 (1 1/2")	G.1 1/2"	G.1 1/2"	35	263	207	56	25	72	128	G.3/4"	14	25.4,f8	50	64	78
50 (2")	G.2"	G.2"	48	293	226	64	28	83	137	G.1"	19	31.8,f8	60	76	94
65 (2 1/2")	G.2 1/2"	G.2 1/2"	57	356	278	75	30	102	186	G.1 1/4"	25	40,f8	55	90	112
80 (3")	G.3"	G.3"	70	407	323	80	30	120	200	G.1 1/2"	25	45,f8	70	110	130
90 (3 1/2")	G.3 1/2"	G.4"	82	518	405	110	40	130	250	G2"	30	60,f8	60	140	160
100 (4")	G.4"	G.4"	95	518	405	110	40	130	250	G.2 1/2"	30	75,f8	60	140	160
125 (5")	•	G.5"	115	688	513	115	45	167	325	G.3"	40	88,f8	70	192	220
150 (6")	•	G.6"	140	688	513	115	45	167	325	G.3 1/2"	40	100,f8	70	192	220

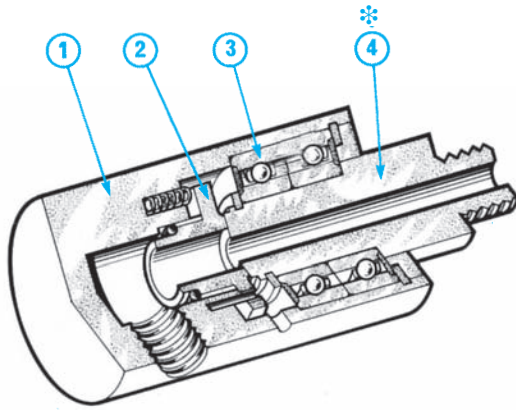
● Flanged, see page 23.

\*The tolerance f8 is to I.S.O 286-2 and BS.EN 202

"G" is the designation for parallel pipe threads to B.S.2779 & I.S.O. 228/1.

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**

## Rotary (L.C.) Union Type B.E.



1. Body.
2. Mechanical seal assembly.
3. Ball bearings - life lubricated.
4. Rotary spindle.

※ THIS PART ROTATES WITH THE SHAFT

The Rotary (L.C.) Union is intended for light duty applications and is of a simple design using the minimum amount of parts. It is not intended as a unit that can be repaired, though this is possible. For low pressures, temperatures and modest speeds with occasional use it is ideal.

For continuous use and easy reparability we recommend the Rotary (R.E.) Union (see page 4), or the Rotary (P.B.) Union (see page 6). The Rotary (L.C.) Union is also useful if there are space limitations, for example where two rotary shafts are close together, or there is limited space between the shaft end and the machine frame. There are two different types available:-

### TYPE L.C./B.E.

This rotary (L.C.) Union is a single flow unit suitable for transferring fluid into or out of a rotating machine shaft.

### TYPE L.C./S.T.

This Rotary (L.C.) Union has the body end tapped to receive a stationary centre tube. This gives flow areas through the centre tube and through the annulus, therefore supply and return of fluid at one end of the machine shaft is possible. Centre tubes are only provided if specified and ordered.

The centre tube should be threaded to pass through the body end and to suit dimension 'O'. An elbow should be fitted onto the tube end matching dimension 'O'. For the 8 (1/4") and 10 (3/8") nominal sizes a pipe thread is impossible. It is therefore necessary to adapt from dimension 'O' to suit a G1/8" or G1/4" Elbow.

### Operational Guidelines (For other conditions contact Filton Limited)

**FLUIDS:** Water, mineral oil and lubricated air (all fluids must be free of abrasives)

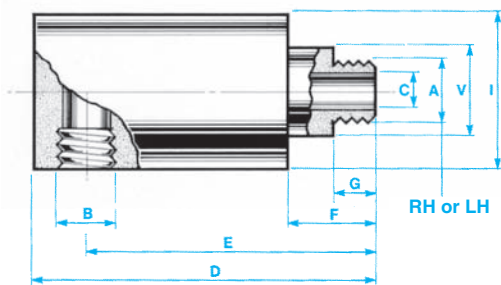
**PRESSURE:** (max) 10 bar

**VACUUM:** (max) 740 mmHg

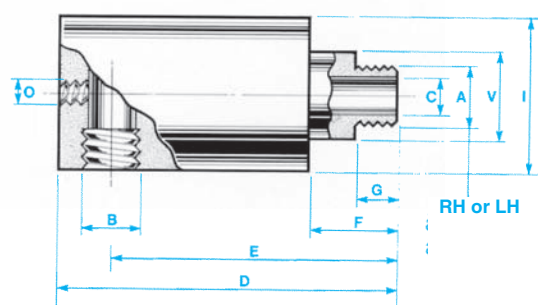
**TEMPERATURE:** -20° to 75°C.

**SPEED:** (max) 2000 rpm

TYPE B.E.



TYPE S.T.



Dimensions in millimetres

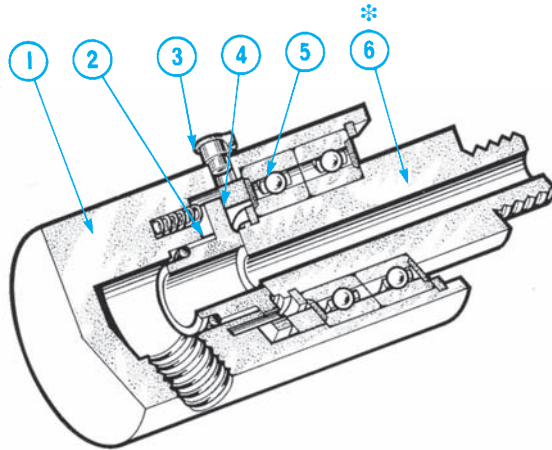
Nom. Size	Part No*		A	B	C	D	E	F	G	I	O	V
	Type B.E.	Type S.T.										
8 (1/4")	18070	18110	G1/4"	R1/4"	6	90	78	24	11	40	M5 x 0.8	24
	18070U	18110U	1/2" - 20 UNF									
	18070MB	18110MB	M12 x 1.25									
10 (3/8")	18071	18111	G3/8"	R3/8"	10	99	82	26	13	40	M6 x 1.0	24
	18071U	18111U	5/8" - 18 UNF									
	18071MB	18111MB	M15 x 1.5									
15 (1/2")	18073	18112	G1/2"	R1/2"	13	127	107	32	16	65	G1/8	38
	18073U	18112U	3/4" - 16 UNF									
	18073MB	18112MB	M22 x 1.5									
20 (3/4")	18074	18113	G3/4"	R3/4"	17.5	130	110	35	19	65	G1/4	38
	18074U	18113U	1"-14 UNS									
	18074MB	18113MB	M30 x 1.5									

\* Add the suffix R for a RH spindle thread 'A'

Add the suffix L for a LH spindle thread 'A'

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**

# ROTARY (P.N.) UNIONS



## The Rotary (P.N.) Union

1. Body.
2. Mechanical seal assembly.
3. Seal face lubricator.
4. Oil reservoir.
5. Ball bearing - life lubricated.
6. Rotary spindle.

\* THIS PART ROTATES WITH THE SHAFT

The Rotary (P.N.) Union has the same basic design as the Rotary (L.C.) Union but incorporates an oil lubrication reservoir for seal face lubrication. This unit is intended for use on pneumatic applications where the compressed air is dry. This unit may also be advantageous compared to the Rotary (L.C.) Union even on lubricated air systems where speeds are high and only occasional pneumatic cycles are in use. Under these conditions very little lubricant reaches the seal faces and is quickly dissipated by the seal face temperatures created by natural friction. Pneumatic applications are, in the main, single flow consequently only this type is offered. Should your application require double flow, please contact our Technical Department.

### Operational Guidelines: (For other conditions contact Filton Limited)

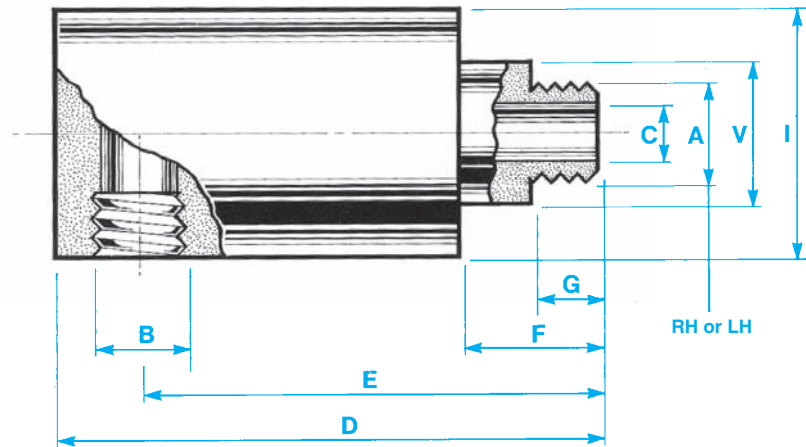
**FLUID**  
Compressed air

**PRESSURE**  
(Max) 10 bar,

**VACUUM**  
Max 740mmHg

**TEMPERATURE**  
5° to 75°C.

**SPEED**  
Max 2500 rpm



IT IS NOT ADVISABLE TO COMBINE MAXIMUMS

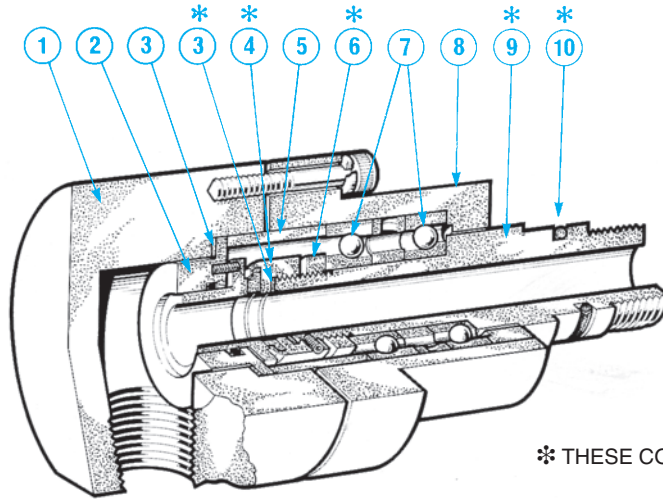
Dimensions in millimetres

Nom. Size	Part No *	A	B	C	D	E	F	G	I	V
8 (1/4")	18400	G1/4"	R1/4"	6	90	78	24	11	40	24
	18400U	1/2"-20 UNF								
	18400MB	M12 x 1.25								
10 (3/8")	18401	G3/8"	R3/8"	10	99	82	26	13	40	24
	18401U	5/8"-18 UNF								
	18401MB	M15 x 1.5								
15 (1/2")	18402	G1/2"	R1/2"	13	127	107	32	16	65	38
	18402U	3/4"-16 UNF								
	18402MB	M22 x 1.5								
20 (3/4")	18403	G3/4"	R3/4"	17.5	130	110	35	19	65	38
	18403U	1"-14 UNS								
	18403MB	M30 x 1.5								

\* Add the suffix R for RH spindle thread 'A'

Add the suffix L for LH spindle thread 'A'

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**



## Rotary (M.C.T.) Union type B.E. with locating spigot

1. Adaptor, aluminium alloy.
2. Mechanical seal sub-assembly.
3. Gaskets.
4. Seal ring sub-assembly.
5. Spacer, plated steel.
6. Locking ring, steel.
7. Angular contact ball bearings.
8. Body aluminium alloy.
9. Rotary spindle, plated steel.
10. 'O' Ring, synthetic rubber.

✱ THESE COMPONENTS ROTATE WITH THE SHAFT

The Rotary (M.C.T.) Union is mainly intended for use on machine tools for the transfer of fluids (such as oil and air) to and from rotating shafts for air and hydraulic chucks, brakes, clutches, etc.

The type of Rotary Seal fitted to the Rotary (M.C.T.) Union is a "FILTON BALANCED MECHANICAL SEAL", containing multiple helical coil springs. The seal face materials are normally carbon against stainless steel. For applications on machine tool coolants where traces of abrasive particles may be present we recommend tungsten carbide seals. If required add code T.C. to the part number.

Rotary sealing is created by relative rotation between extremely flat sealing faces (items 2 and 4) held in contact by the helical coil springs and an additional sealing force created by the pressure of the fluid passing through the Rotary (M.C.T.) Union.

The Rotary (M.C.T.) Union is fitted with a matched pair of pre-loaded angular contact ball bearings lubricated for life with a special grease.

A double range of Rotary (M.C.T.) Unions is offered with the machine end connection having parallel pipe threads (R.H. or L.H.) for speeds up to 1,500 r.p.m. and with an additional concentric locating spigot for speeds up to 3,000 r.p.m.

There are 3 variations of the stationary Adaptor end, diagrams on page 17 and described below:-

### TYPE M.C.T./B.E.

This is a single flow unit and is suitable for transferring fluid in to, or out of rotating machines.

### TYPE M.C.T./S.T.

This Rotary (M.C.T.) Union is fitted with an Adaptor suitable for double flow utilising a stationary centre tube. This gives flow areas through the centre tube and annulus. Centre tubes are only provided if ordered. The centre tube is fixed to the Rotary (M.C.T.) Union end by means of a screw thread shown as dimension 'O'. Flow can pass in through the centre tube and return through the annulus or be reversed.

### TYPE M.C.T./R.S.

The Adaptor fitted to this Rotary (M.C.T.) Union is suitable for a rotating centre tube, which must be located and driven by the machine. Centre tubes are only provided if ordered. The Adaptor of this type is provided with a FILTON BALANCED MECHANICAL SEAL to seal effectively the two separate flow areas. The rotating part of this seal must be locked to the centre tube after fitting, for the seal to function correctly. Flow can pass in through the centre tube with the return through the annulus, or be reversed.

## Operational Guidelines (For other conditions contact Filton Limited)

### FLUIDS

Mineral oils, machine tool coolants and compressed air (lubricated). All fluids should be clean and free from abrasive particles. Special tungsten carbide seals are available for abrasive conditions, if required add "TC" as a suffix to the part number).

### PRESSURE

70 bar maximum.

### VACUUM

740 mm Hg. maximum (specify vacuum and we will test for this).

### TEMPERATURE

-20° to 75°C.

### SPEED

1500 r.p.m. maximum without a locating spigot.  
3000 r.p.m. maximum with a locating spigot.

### FLOW CAPACITY

Nominal Size	Type	Liquids*		Air† m³/h
		m³/h	l/min	
8 (1/4")	B.E.	0.3	5	11
	S.T. & R.S.	0.05	0.8	2
10 (3/8")	B.E.	0.8	13.3	29
	S.T. & R.S.	0.1	1.7	4
15 (1/2")	B.E.	1.7	28.3	58
	S.T. & R.S.	0.3	5	10
20 (3/4")	B.E.	2.7	45	96
	S.T. & R.S.	0.6	10	22
25 (1")	B.E.	4.1	68.3	144
	S.T. & R.S.	1.8	30	44

\* Flow in cubic metres/hour at a velocity of 3 metres/second.

† Flow in cubic metres/hour free air at a velocity of 15 metres/second and a pressure of 6 bar.

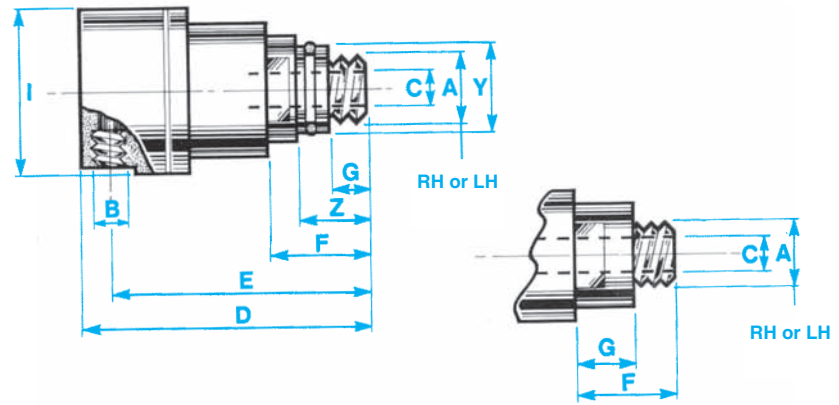
IT IS NOT ADVISABLE TO COMBINE MAXIMUMS

# ROTARY (M.C.T.) UNIONS

FILTON

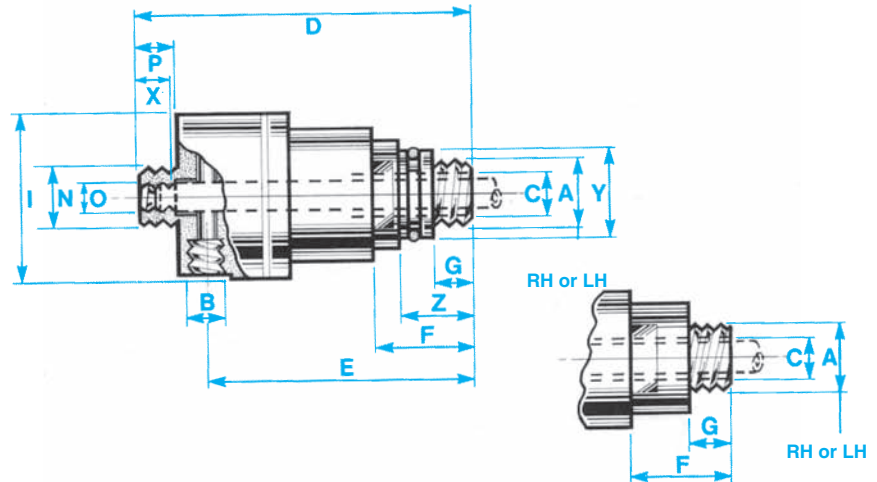
## For single flow type M.C.T./B.E.

Nominal Size	Part Numbers		R or L
	with spigot	without spigot	
8 (1/4")	16310	16260	R or L
10 (3/8")	16313	16263	R or L
15 (1/2")	16316	16266	R or L
20 (3/4")	16319	16269	R or L
25 (1")	16322	16272	R or L



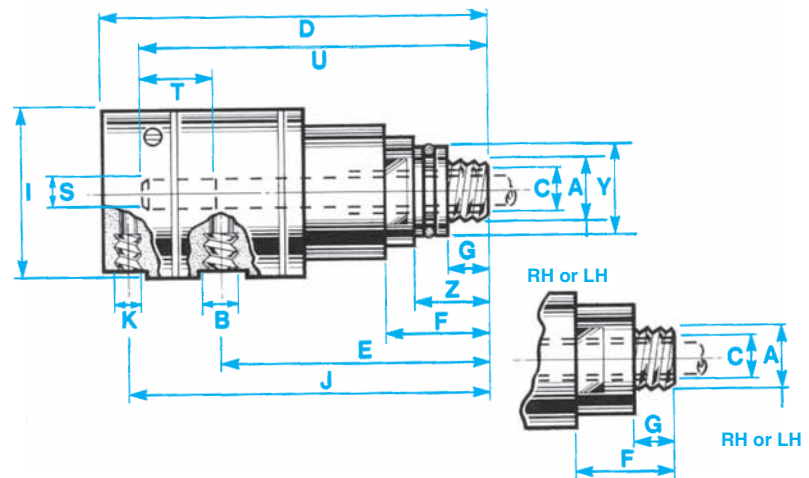
## For double flow (stationary centre tube) type M.C.T./S.T.

Nominal Size	Part Numbers		R or L
	with spigot	without spigot	
8 (1/4")	16311	16261	R or L
10 (3/8")	16314	16264	R or L
15 (1/2")	16317	16267	R or L
20 (3/4")	16320	16270	R or L
25 (1")	16323	16273	R or L



## For double flow (rotary centre tube) type M.C.T./R.S.

Nominal Size	Part Numbers		R or L
	with spigot	without spigot	
8 (1/4")	16312	16262	R or L
10 (3/8")	16315	16265	R or L
15 (1/2")	16318	16268	R or L
20 (3/4")	16321	16271	R or L
25 (1")	16324	16274	R or L



Dimensions in millimetres

Nominal Size	A	B		C	D		D		D		E		F	
		B.E.	S.T.		B.E.	S.T.	R.S.	*	Δ	*	Δ	*	Δ	
8 (1/4")	G1/4"	G1/4"	G1/8"	6	137	125	141	129	188	176	120	103	37	25
10 (3/8")	G3/8"	G3/8"	G1/8"	10	140	128	146	134	191	179	122	106	40	28
15 (1/2")	G1/2"	G1/2"	G1/4"	14	168	152	171	154	230	213	143	126	45	28
20 (3/4")	G3/4"	G3/4"	G3/8"	18	180	155	190	165	247	222	155	130	57	31
25 (1")	G1"	G1"	G1/2"	22	195	180	201	186	265	250	163	148	57	42

Nominal Size	G & P	I	J	K	N	O	S	T	U		X	Y	Z	
									*	Δ				
8 (1/4")	11	65	178	166	G1/8"	G1/4"	M5	4.97/4.95	60	171	159	10	15	22
10 (3/8")	13	65	180	168	G1/8"	G3/8"	M6	5.97/5.95	60	174	162	10	20	25
15 (1/2")	16	90	220	203	G1/4"	G1/2"	G1/2"	9.52/9.50	70	215	198	13	25	32
20 (3/4")	20	90	232	207	G3/8"	G3/4"	G1/4"	12.70/12.67	70	227	202	16	30	45
25 (1")	22	115	250	235	G1/2"	G1"	G3/8"	15.97/15.95	80	245	230	20	38	42

\* With a locating spigot

Δ Without a locating spigot

† The machine recess dimension should be H7 - I.S.O. 286-2 and BS.EN 202

'G' is the designation for parallel pipe threads to BS2779 and ISO 228/1

**SEE PAGE 22 FOR INSTALLATION INSTRUCTIONS**



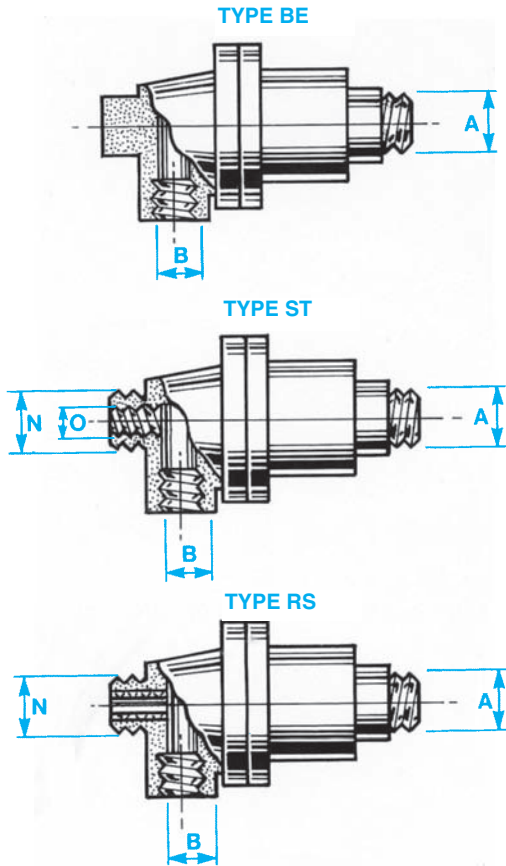


# SEMI-STANDARD ROTARY UNIONS

## Special Connections - Screw threads

The standard connection threads are 'G' pipes threads to BS.2779 and ISO.228/1 (formerly B.S.P. Parallel). We can supply variations on these to suit the machine requirements. The regular variations are shown below. If these are required add the Rotary Union part number.

**Note** - All rotary connections (dimension 'A') can be provided with RH or LH threads to suit the direction of rotation.



CODE	SPINDLE THREAD 'A' (RH or LH)	ADAPTOR THREADS 'B' 'N' & 'O'
F	'G' pipe thread (parallel) Female†	'G' pipe thread (parallel)
M.B.	Metric thread*	'G' pipe thread (parallel)
M.N.	Metric thread*	N.P.T.
N.P.T.	N.P.T.	'G' pipe thread (parallel)
N.P.T.2	N.P.T.	N.P.T.
N.P.T.3	'G' pipe thread (parallel)	N.P.T.
P.P.	A.P.P.T/NPSM	'G' pipe thread (parallel)
P.P.N.	A.P.P.T/NPSM	N.P.T.
T.R.	'R' pipe thread (taper)	'G' pipe thread (parallel)
T.R.2	'R' pipe thread (taper)	'R' pipe thread (taper)
U	Unified thread*	'G' pipe thread (parallel)
U.N.	Unified thread*	N.P.T.

\*See table below for specific sizes.

ROTARY UNION NOMINAL SIZE	SPINDLE THREAD - 'A' (RH or LH)	
	UNIFIED (code U)	METRIC (code M)
8 (1/4")	1/2" - 20 U.N.F.	M12 x 1.25
10 (3/8")	5/8" - 18 U.N.F.	M15 x 1.50
15 (1/2")	3/4" - 16 U.N.F.	M22 x 1.50
20 (3/4")	1" - 14 U.N.S.	M30 x 1.50
25 (1")	1 1/2" - 12 U.N.F.	M35 x 1.50
32 (1 1/4")	1 3/4" - 12 U.N.	M40 x 1.50
40 (1 1/2")	2" - 12 U.N.	M50 x 1.50
50 (2")	2 1/2" - 12 U.N.	M60 x 2.00
65 (2 1/2")	3" - 12 U.N.	M76 x 2.00
80 (3")	3 1/2" - 12 U.N.	M90 x 2.00

† If an alternative female thread is required for the spindle thread 'A', add prefix 'F' to the appropriate thread code.

G' pipe threads are to BS.2779 & ISO.228/1 (formerly B.S.P. parallel)

'R' pipe threads are to BS.21 & ISO.7/1 (formerly B.S.P. taper).

## Material and Mechanical Variations

There are times when our standard materials of construction are unacceptable due to the fluid flow or the working environment.

Common Variations of this type are coded as shown adjacent. If the material you require is not shown please contact our Technical Department to discuss your requirements.

Variations on seal face materials are also available to suit specific needs.

Code	Variation
LF	- Reduced torque - available for the R.E., and R.E.B. only.
LO	- Overall length reduced - types B.E. only for the R.E., R.E.B., C.B. & C.B.N.
MS	- Mechanical seal instead of Bellows Seal.
NI	- External surfaces electroless nickel plated.
SLB	- Sealed for life ball bearings - for R.E., P.B. and R.E.B. only.
SS	- All metal parts (except ball bearings) in stainless steel 316S11.
SSC	- Fluid wetted metal parts in stainless steel 316S11.
TC	- Tungsten carbide seal faces - up to 50 (2") nominal bore only.
TCC	- Tungsten carbide to carbon seal faces - up to 50 (2") nominal bore only.
Y2	- Seal faces for dry running.

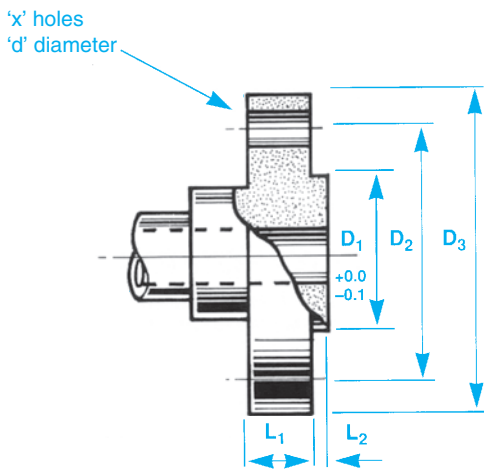
CONTACT OUR TECHNICAL DEPARTMENT TO DISCUSS THE APPLICATION FOR THESE VARIATIONS.

**THE CODE SHOULD BE ADDED AS A SUFFIX TO THE PART NUMBER**

# STANDARD SPINDLE FLANGES



It is desirable to fit a flanged spindle if rotating shafts are constantly reversing. We also recommend flanged, rather than threaded, spindles for 125 (5") and 150 (6") Rotary Unions for ease of assembly and removal. The following standard range is therefore offered. PLEASE ADD SUFFIX "SF" TO THE ROTARY UNION PART NUMBER.



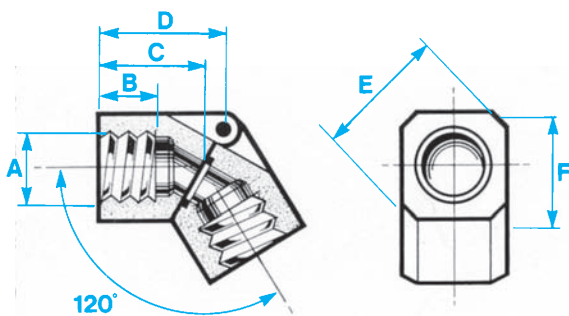
## ROTARY UNION NOMINAL SIZE

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	x	d
15 (1/2")	45	65	95	14	6	4	14
20 (3/4")	58	75	105	16	6	4	14
25 (1")	68	85	115	16	6	4	14
32 (1 1/4")	78	100	140	18	6	4	18
40 (1 1/2")	88	110	150	18	6	4	18
50 (2")	102	125	165	20	6	4	18
65 (2 1/2")	122	145	185	20	8	4	18
80 (3")	138	160	200	20	8	8	18
100 (4")	158	180	220	22	8	8	18
125 (5")	188	210	250	22	10	8	18
150 (6")	212	240	285	22	10	8	22

Dimensions in millimetres

BASED ON BS4504 PN16

# SYPHON ELBOWS



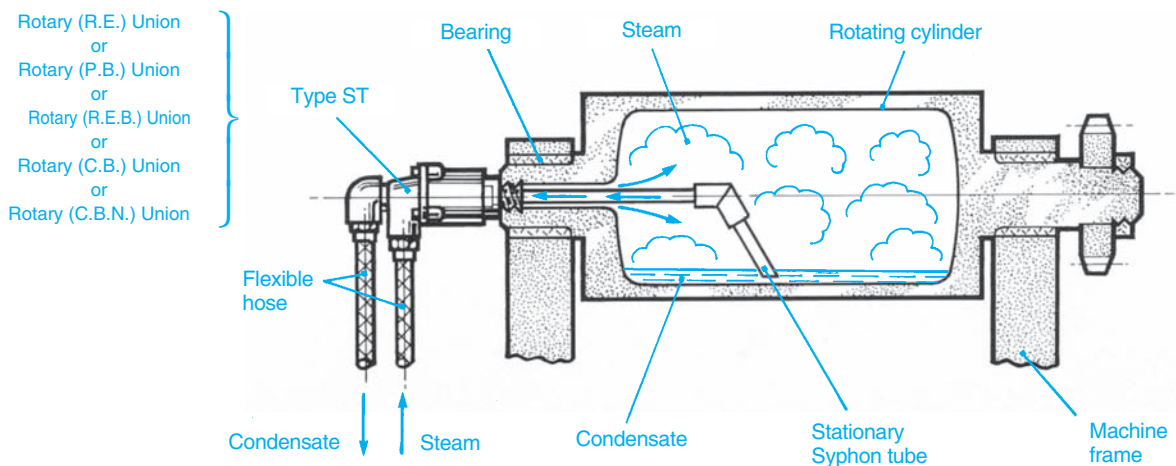
Dimensions in millimetres

Nominal Size	Part No.	A	B	C	D	E	F
8 (1/4")	14961	G 1/4"	9.5	19.0	22.2	22.9	19.1
10 (3/8")	14940	G 3/8"	12.7	27.0	31.8	29.5	22.2
15 (1/2")	14962	G 1/2"	15.8	28.6	34.1	36.3	28.6
20 (3/4")	14963	G 3/4"	19.0	34.9	42.9	42.7	34.9

'G' is the designation for parallel pipe threads to BS2779 and ISO 228/1

To select a suitable SYPHON ELBOW for a Rotary (P.B.), (R.E.), (R.E.B.) (C.B.) or (C.B.N.) Union type S.T. check the centre tube thread, dimension 'O' of the appropriate Rotary Union. The thread 'A' of the SYPHON ELBOW must match this.

## Typical Application



FILTON SYPHON ELBOW shown with a FILTON ROTARY UNION type S.T. on a steam heated cylinder.

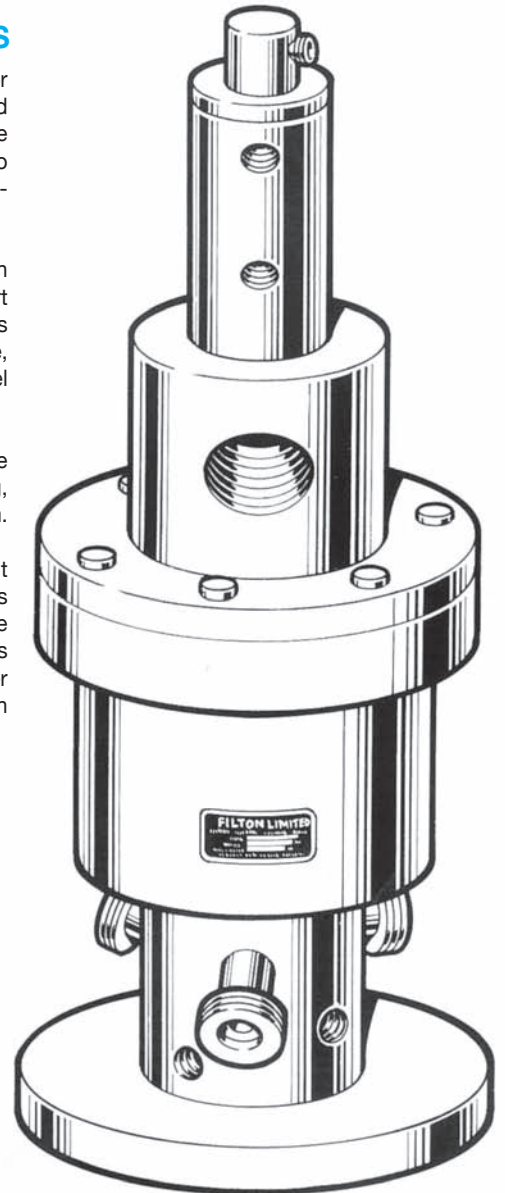
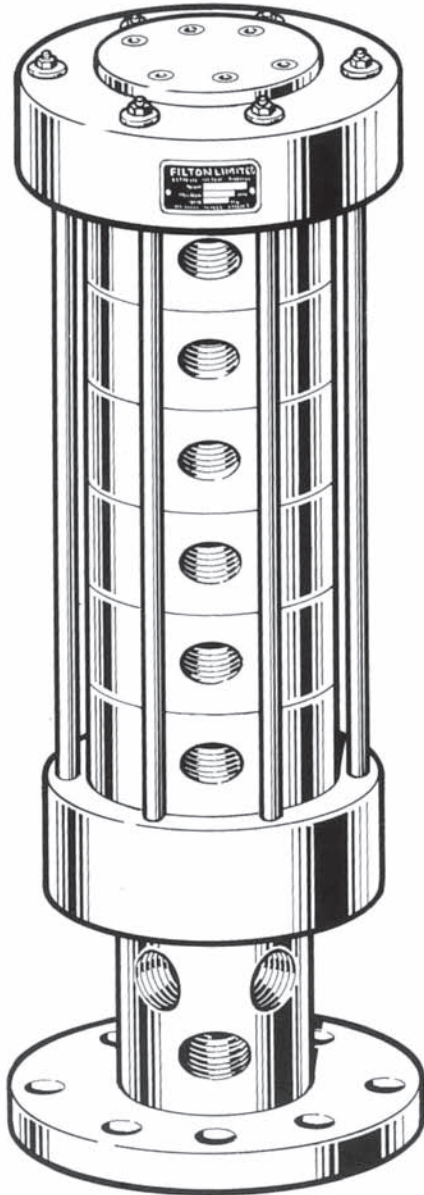
## MULTI PORT ROTARY UNIONS

Although, in the main, the applications for Rotary Unions are covered by our standard range, there are many times when the machinery specification is impossible to satisfy without resorting to a special multi-channel design.

We have had many years experience in designing and manufacturing Multi Port Rotary Unions in a wide range of materials of construction including aluminium, bronze, carbon steel, stainless steel and nickel alloys.

The Multi Port Rotary Unions we have provided have included services for cooling, heating, hydraulics, pneumatics and vacuum.

There are times when there is a requirement for the rotary transfer of electrical services as well as the services indicated in the previous paragraph. We can design in this facility if required whether it be for power slip rings and brushes or for instrumentation purposes.



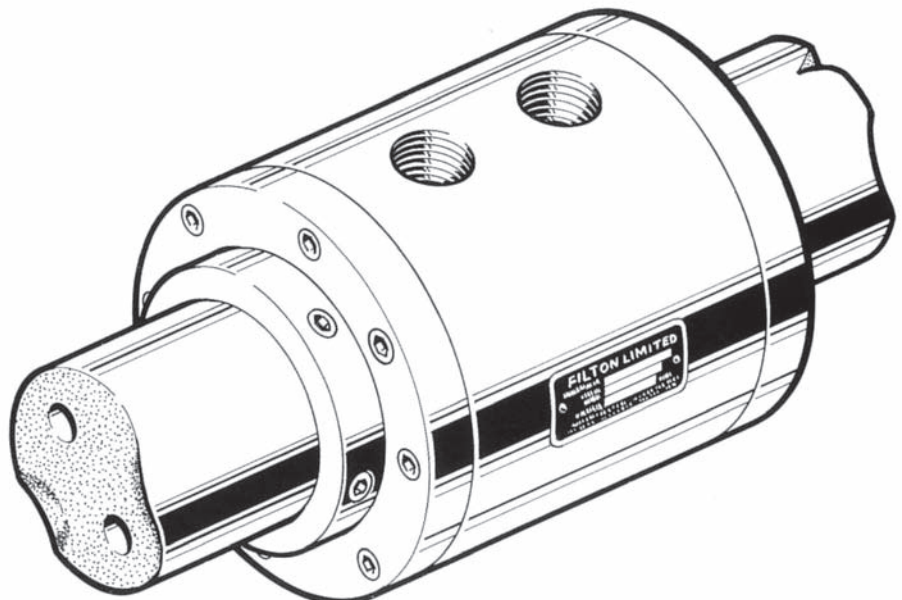
## OVERSHAFT ROTARY UNIONS

All of the standard Rotary Unions in this technical manual are for connecting to the end of a rotating shaft. There are times when end access is impossible and the only way to transfer services is at some point along the shaft.

The illustration on the right is a typical design for an Overshaft Rotary Union. The type shown is for two services passing into and axially along the machine shaft.

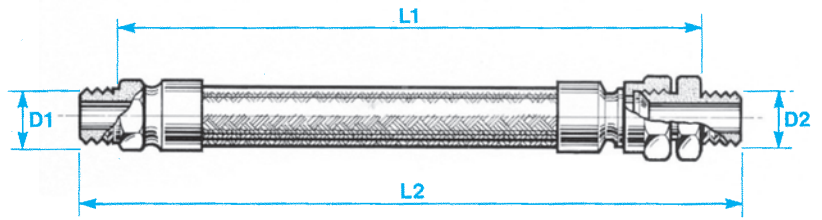
We can also provide a design which incorporates the rotary connection into the Rotary Union sleeve for transferring services externally along the shaft.

We recommend that every effort should be made to obtain shaft end access to use standard designs as Overshaft Rotary Unions are costly and can require major machinery dismantling for servicing purposes.



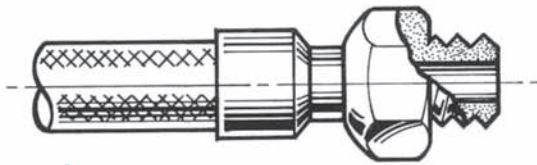
## The construction of our standard flexible hose is:

1. Stainless steel convoluted tube.
2. Stainless steel external reinforcing braid.
3. Mild steel end fittings.
4. The assembly is welded and pressure tested.
5. Fixed male to swivel male end fittings.

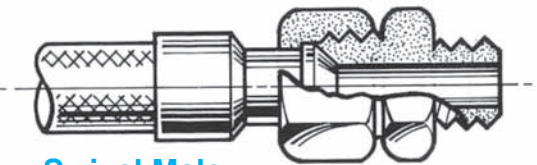


Dimensions in mm

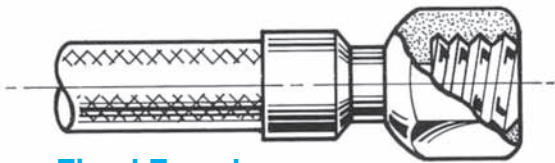
## END FITTINGS



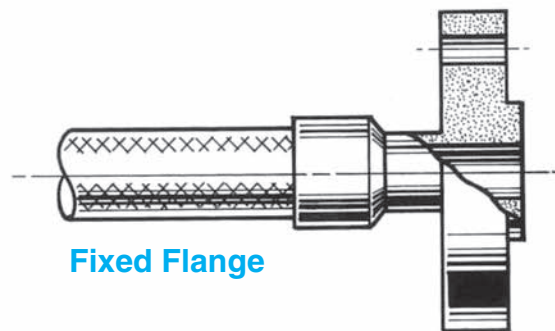
Fixed Male



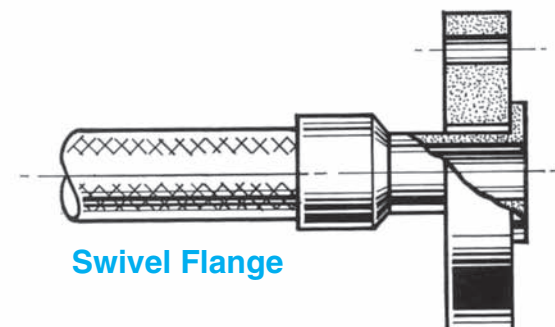
Swivel Male



Fixed Female



Fixed Flange



Swivel Flange

Part No.	D*	L <sub>1</sub>	L <sub>2</sub>	Min. Centre Line Bend Radius	Max Pressure bar
M240/1	R1/4"	150	182	102	85
M240/2	R3/8"	230	262	152	61
M240/3	R1/2"	305	343	203	55
M240/4	R3/4"	305	343	191	34
M240/5	R1"	380	424	261	29
M240/6	R1 1/4"	460	517	229	23
M240/7	R1 1/2"	460	517	254	21
M240/8	R2"	610	667	279	19
M240/9	R2 1/2"	610	674	330	16
M240/10	R3"	760	831	381	15
M240/11	R4"	915	1016	500	9
M240/12	R5"	915	1035	740	9
M240/13	R6"	915	1042	970	5

\*'R' is the designation for tapered pipe threads to BS21 and ISO 7/1 (formerly designated B.S.P. taper)

The table and diagram above show our standard range of flexible hose for use with our Rotary Unions on water, steam, low pressure oil and hot oil services. The lengths shown are the minimum recommended to give the necessary curvature and flexibility for connection to the Rotary Unions.

We also have a similar size range to the above with the end fittings in stainless steel instead of mild steel. If these are required use the base part number M241 instead of M240.

As well as the standard range shown, we can provide lengths to your own requirements together with a variety of end fittings. The popular types of end fittings are shown in the adjacent diagrams.

Alternative pipe threads can also be provided, for example NPT.

If you require flanged fittings, one flange should be a swivel type to aid stress-free fitting. A swivel flange should always be used if the opposite end is a fixed threaded type. We can provide flanges to the following specifications:-

A.F.N.O.R.  
A.N.S.I.

BS.10  
BS.1560  
B5.4504

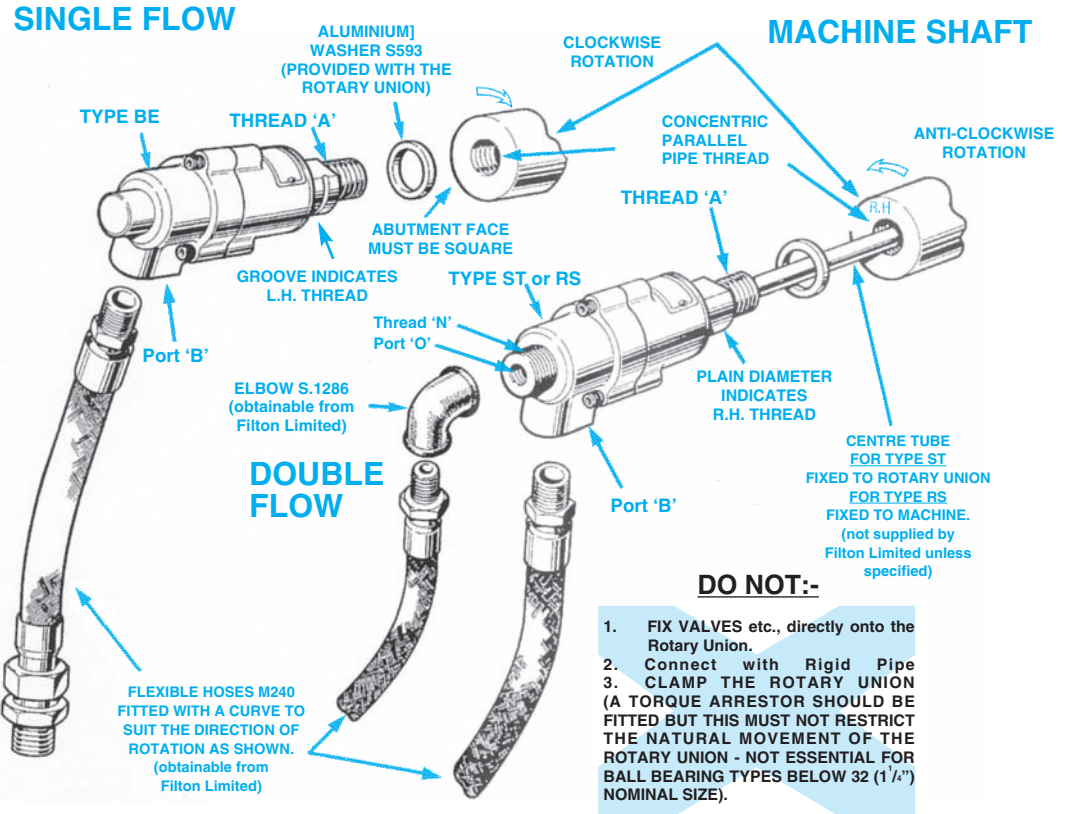
D.I.N.  
I.S.O.



Install as shown in the diagrams adjacent. Ensure that spindle thread 'A' is RH or LH to suit the direction of rotation of the machine shaft as shown.

If the machine shaft reverses direction of rotation securely lock the spindle or preferably use a flanged connection (see page 23).

Fully detailed Installation and Maintenance leaflets are available.



## CONNECTIONS FOR ROTARY (R.E.) (P.B.) (R.E.B.) (C.B.) (C.B.N.) AND (I.N.T.) UNIONS

FLEXIBLE HOSES			ELBOWS		HEX BUSHES	
Part No	Thread	Length	Part No	Threads	Part No	Threads
M240/1	R1/4"	150	S.1286/1	Rp1/4" x 1/4"	S.1287/1	R3/8" x Rp1/4"
M240/2	R3/8"	229	S.1286/2	Rp3/8" x 1/4"	S.1287/2	R1/2" x Rp1/4"
M240/3	R1/2"	305	S.1286/4	Rp1/2" x 1/4"	S.1287/4	R3/4" x Rp1/4"
M240/4	R3/4"	305	S.1286/7	Rp3/4" x 1/4"	S.1287/8	R1" x Rp3/8"
M240/5	R1"	380	S.1286/10	Rp1" x 3/8"	S.1287/13	R1 1/4" x Rp1/2"
M240/6	R1 1/4"	460	S.1286/14	Rp1 1/4" x 1/2"	S.1287/19	R1 1/2" x Rp3/4"
M240/7	R1 1/2"	460	S.1286/18	Rp1 1/2" x 3/4"	S.1287/25	R2" x Rp1"
M240/8	R2"	610	S.1286/23	Rp2" x 1"	S.1287/31	R2 1/2" x Rp1 1/4"
M240/9	R2 1/2"	610	S.1286/27	Rp2 1/2" x 1 1/4"	S.1287/38	R3" x Rp1 1/2"
M240/10	R3"	760	S.1286/29	Rp3" x 1 1/2"	S.1287/44	R4" x Rp2"
M240/11	R4"	915	S.1286/33	Rp4" x 2"	S.1287/45	R4" x Rp2 1/2"
M240/12	R5"	915	S.1286/34	Rp4" x 2 1/2"	S.1287/47	R5" x Rp3"
M240/13	R6"	915	S.1286/37	Rp5" x 3"	S.1287/50	R6" x Rp4"
			S.1286/39	Rp6" x 4"		

Stainless/mild steel construction.  
For full details of hoses see page 21.

Malleable iron for pressures up to 17 bar.

**NOTE:** Pipe thread R is taper male to BS21 + ISO R7/1

Pipe thread Rp is parallel female to BS21 + ISO R7/1 to suit R taper male.

## HEALTH AND SAFETY

The Rotary Unions shown in this leaflet should not present any hazard when correctly fitted and used.  
**To ensure satisfactory performance, every Rotary Union is run-in and leakage tested before despatch.**

It is essential to use the correct hand of rotary connection thread to ensure the Rotary Union will not unscrew (see the Installation Instructions) page 28.) If a shaft reverses rotation then it must be locked or preferably use a flanged connection.

At some time the seals in the Rotary Union will leak, so inspect daily, also ensure that leakages are not hazardous to personnel and that the Rotary Union is removed for repair immediately. If leakages are not attended to promptly, bearing seizure may occur causing flexible hose failure and massive leakage. Fit protective guards if leakages or the rotating spindle are likely to be hazardous to personnel or equipment.

For hazardous applications fit an excess torque detector to stop the machine before major damage occurs to flexible hoses causing massive leakage.

With oil systems minor leakages occur due to the natural characteristics of oil preventing seal faces from contacting fully. Please note that non-asbestos gaskets have replaced the compressed asbestos fibre material used previously.



The logo consists of a blue diamond shape with the word "FILTON" written in white, bold, uppercase letters inside it.

**FILTON**

The text "Swivel Joints" is positioned on a large, curved blue background that occupies the right side of the page.

**Swivel Joints**



## What are Swivel Joints?

Swivel Joints are sealing devices which allow the leakproof transfer of fluid to and from slow and intermittent rotating machinery.

These products are intended for use in a factory environment. Contact us if the installation is subjected to climatic conditions.

A few typical applications are shown on p3.

Fluids should be free of abrasive particles and water systems should be treated if “scaling” is likely to occur.

The majority of FILTON SWIVEL JOINTS use industrial standard ball bearings. These have the distinct advantage that spare bearings are available anywhere in the world. These bearings do not cause wear on the body and spindle which does occur where these items are designed to be the bearing races.

Page No.	4	5	6	7	8	9
Medium	NHP	LD	XP	XP/RS	XP/MT	XP/MO
Air	✓	✓	✓	✓	✓	✓
Gas *		✓	✓			
Oil-lubrication	✓	✓	✓	✓	✓	✓
Oil-hydraulic	✓		✓	✓	✓	✓
Vacuum	✓	✓				
Water	✓	✓	✓	✓	✓	✓

✓ - Suitable but check full working conditions

\* - Dependant on the type of gas and working conditions

## Who are Filton Limited?

Filton Limited is a Private Limited Company which celebrated its 60th Anniversary in 2002. The Company was founded by Mr William Murray, to manufacture conventional leather oil seals for rotary shafts, but is now universally known as one of the world’s leading manufacturers of Swivel Joints various types of which are described in the following pages. The main interest of the Company is still with rotary seals but using state of the art designs and when required, sophisticated seal materials which enable us to undertake and solve complex sealing problems. Multi-port Swivel Joints are now common-place, and if a suitable design is not already available our design team is at your disposal to consider the specification needed. **Quality is Paramount.** All components are rigorously inspected during manufacture and every Swivel Joint is pressure tested before despatch to ensure satisfactory performance when installed in accordance with our recommendations.

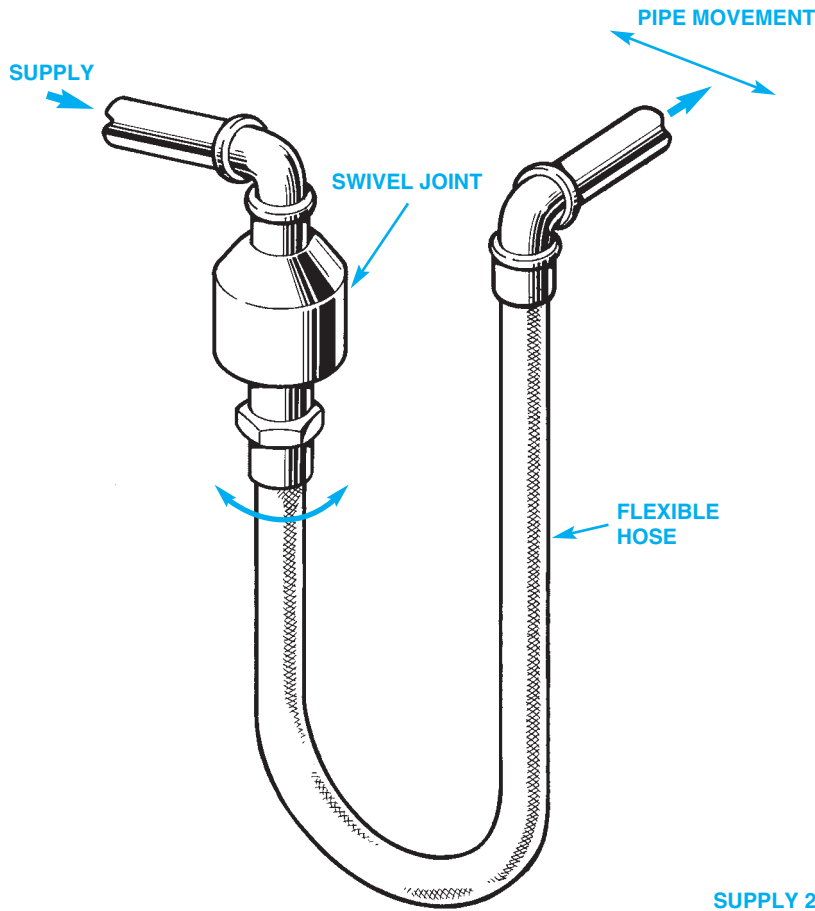
## Health and Safety

The Swivel Joints shown in this leaflet should not present any hazard when correctly fitted and used.

ALL FILTON SWIVEL JOINTS ARE LEAKAGE TESTED BEFORE DESPATCH.

At some time the seals in the Swivel Joint will leak, so inspect regularly, also ensure that leakages are not hazardous to personnel and that the Swivel Joint is removed for repair immediately. If leakages are not attended to promptly, bearing seizure may occur causing massive leakage. Fit protective guards if leakages are likely to be hazardous to personnel or equipment.

With oil systems minor leakages occur due to the natural characteristics of oil preventing the seal from contacting fully.

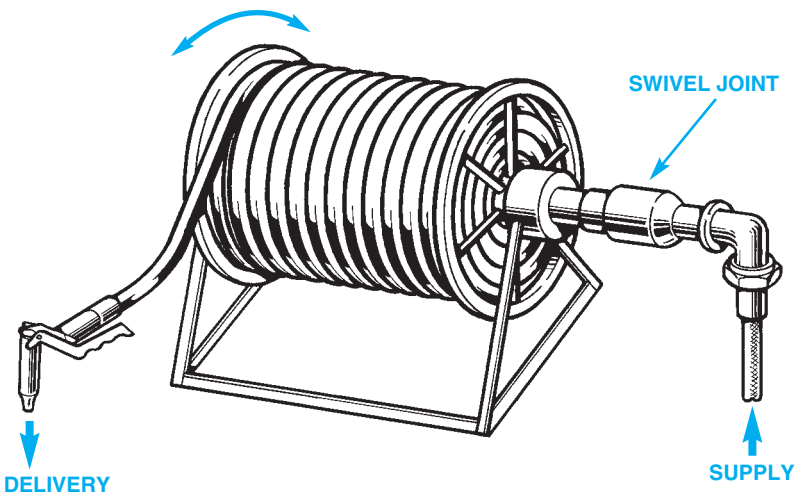
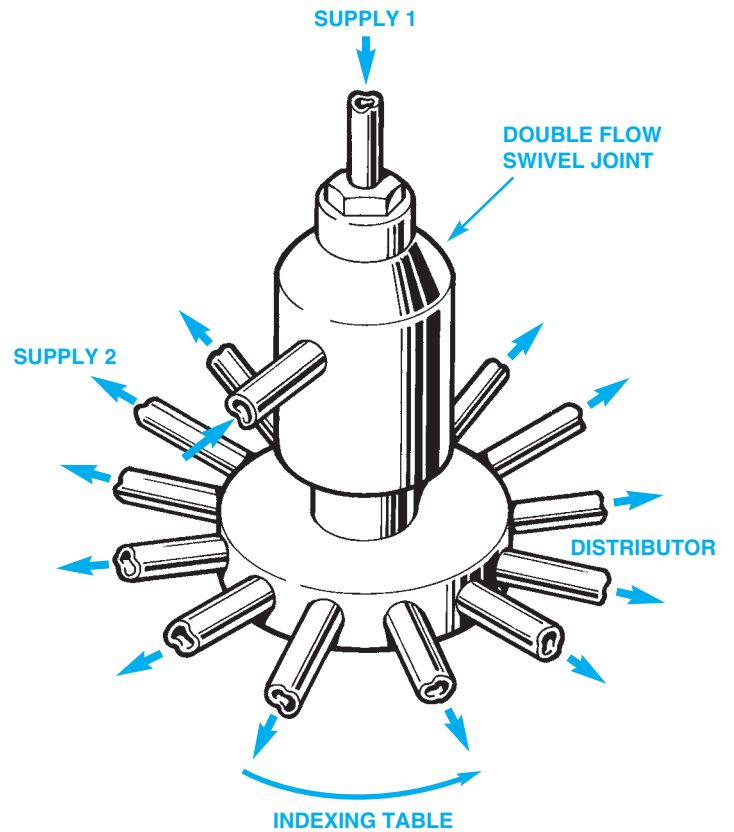


## FLEXIBLE HOSE

Where pipework connections are made with flexible hose and movement occurs the hose can have a short life. Remove the strain by using a FILTON SWIVEL JOINT

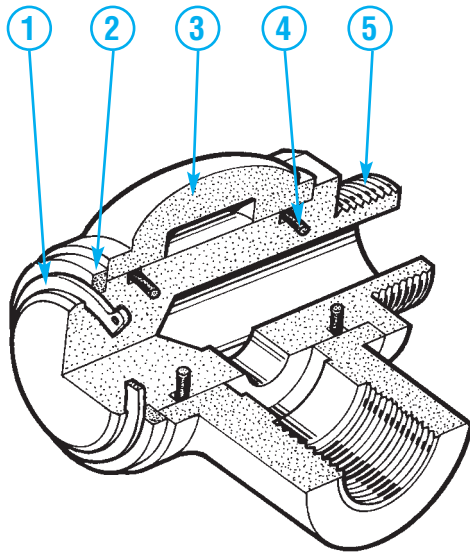
## INDEXING MACHINES

A double flow FILTON SWIVEL JOINT can be used to supply pneumatic or hydraulic services for functional or sensing purposes on a semi rotary machine table.



## HOSE REELS

A FILTON SWIVEL JOINT will allow leak proof transfer from a bulk supply tank to a hose reel system for distribution purposes.



## Specification

1. Circlip - carbon spring steel
2. Washer - steel, zn plated
3. Body - s.g. iron
4. 'O' rings - nitrile rubber
5. Spindle - steel, e.ni plated

SPECIALS ARE AVAILABLE SEE PAGE 10

The NHP SWIVEL JOINT is the simplest form of swivel joint used mainly for very slow occasional movements.

## Operational Guidelines

### FLUIDS

Water, mineral oils and lubricated compressed air.

All fluids must be clean and free of abrasive and corrosive elements.

### PRESSURE

85 bar maximum. (For 40 (1 1/2") and 50 (2") maximum pressure for compressed air is 20 bar.)

### VACUUM

740 mm Hg

### TEMPERATURE

100°C maximum

### SPEED

Slow intermittent rotary movement.

DIMENSIONS									
Nom. Size	Part No.	A	B	C	D	E	F	G	H
8 (1/4")	16899	G.1/4"	G.1/4"	29	48	35	8	18	6
8 (1/4")	16899BOS	G.1/4"	G.3/8"	29	48	35	8	18	6
10 (3/8")	16900	G.3/8"	G.3/8"	30	49	35	10	18	10
15 (1/2")	16901	G.1/2"	G.1/2"	49	84	57	16	32	12
20 (3/4")	16902	G.3/4"	G.3/4"	56	90	57	19	32	17
25 (1")	16903	G.1"	G.1"	70	116	76	22	43	22
32 (1 1/4")	16904	G.1 1/4"	G.1 1/4"	76	122	76	25	43	30
40 (1 1/2")	16905	G.1 1/2"	G.1 1/2"	87	149	95	25	64	36
50 (2")	16906	G.2"	G.2"	94	156	95	32	64	45

Dimensions in millimetres

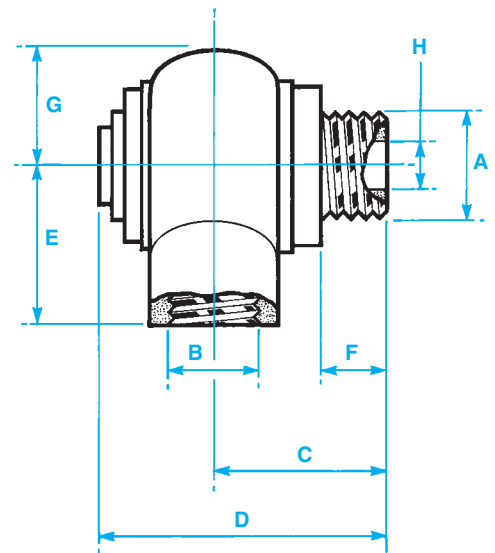
'G' is the designation for parallel pipe threads to B.S.2779 and ISO.228/1 (formerly B.S.P. parallel).

## FLOW CAPACITY

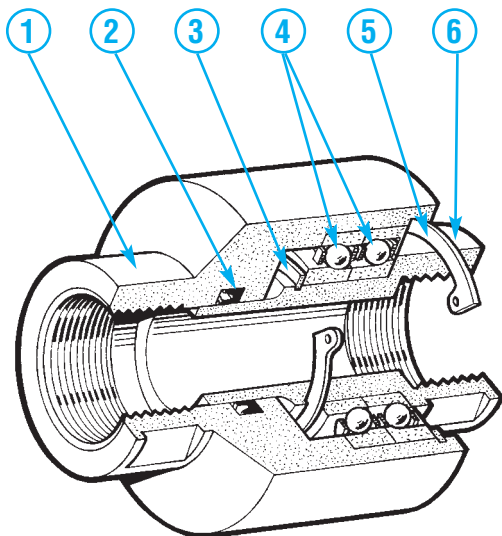
Nominal Size	Liquids *		Air ▲
	m <sup>3</sup> /h	l/min	m <sup>3</sup> /h
8 (1/4")	0.3	5	10
10 (3/8")	0.8	14	30
15 (1/2")	1.2	20	42
20 (3/4")	2.4	41	85
25 (1")	4.1	68	142
32 (1 1/4")	7.6	127	264
40 (1 1/2")	11.0	183	380
50 (2")	17.2	283	594

\* Flow at a velocity of 3 m/s

▲ Flow of free air at 15 m/s and 6 bar







## Specification

1. Body - steel
2. Seal - nitrile rubber
3. Circlip - spring steel
4. Ball bearings
5. Circlip - spring steel
6. Spindle - e.ni plated

SPECIALS ARE AVAILABLE SEE PAGE 10

The LD SWIVEL JOINT is generally used for slow continuous rotation and intermittent angular movements for modest pressures.

## Operational Guidelines

### FLUIDS

Water, mineral oils, lubricated air and natural gas (see page 11 for specials if general gas leakage detection is not available).  
 Sizes 32 (1 1/4") to 50 (2") - Natural Gas on application.

All fluids must be clean and free of abrasive and corrosive elements.

### PRESSURE

10 bar maximum

### VACUUM

740 mm Hg {add suffix 'VAC' to the part No.}

### TEMPERATURE

100°C maximum

### SPEED

5 rpm - intermittent

## FLOW CAPACITY

Nominal Size	Liquids *		Air ▲
	m <sup>3</sup> /h	l/min	m <sup>3</sup> /h
20 (3/4")	3.06	51	106
25 (1")	5.48	91	189
32 (1 1/4")	8.68	145	300
40 (1 1/2")	12.25	204	424
50 (2")	21.89	365	757

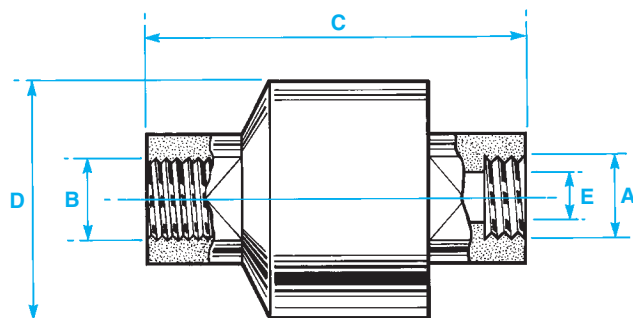
\* Flow at a velocity of 3 m/s

▲ Flow of free air at 15 m/s and 6 bar

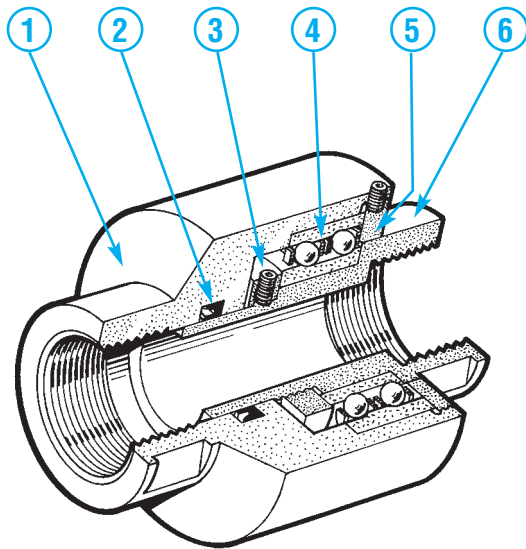
## DIMENSIONS

Nom. Size	Part No.	A & B	C	D	E
20 (3/4")	18216	G.3/4"	96	65	19
25 (1")	18217	G.1"	106	76	25
32 (1 1/4")	18218	G.1 1/4"	114	85	32
40 (1 1/2")	18158	G.1 1/2"	127	90	38
50 (2")	18159	G.2"	155	110	51

Dimensions in millimetres



'G' is the designation for parallel pipe threads to B.S.2779 and ISO.228/1 (formerly B.S.P. parallel).



## Specification

1. Body - steel
2. Seal - polyurethane rubber
3. Locking ring - steel
4. Double row angular contact ball bearing
5. Locking ring - steel
6. Spindle - steel, hard chromed on sealing surface

SPECIALS ARE AVAILABLE SEE PAGE 10

The XP SWIVEL JOINT is generally used for slow continuous rotation and intermittent angular movements for high pressure systems.

## Operational Guidelines

### FLUIDS

Water, mineral oils and compressed air.

All fluids must be clean and free of abrasive and corrosive elements.

### PRESSURE

200/400 bar maximum depends on size - see below  
 For 40 (1 1/2") and 50 (2") maximum for compressed air is 20 bar.

### TEMPERATURE

80°C maximum

### SPEED

5 rpm - intermittent

## FLOW CAPACITY

Nominal Size	Liquids *		Air ▲
	m <sup>3</sup> /h	l/min	m <sup>3</sup> /h
6 (1/4")	0.35	5.8	12
10 (3/8")	0.77	12.8	27
15 (1/2")	1.37	22.8	47
20 (3/4")	3.06	51	106
25 (1")	5.48	91	189
32 (1 1/4")	8.68	145	300
40 (1 1/2")	12.25	204	424
50 (2")	21.89	365	757

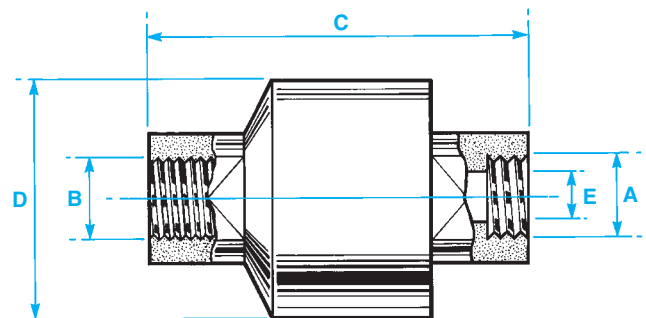
\* Flow at a velocity of 3 m/s

▲ Flow of free air at 15 m/s and 6 bar

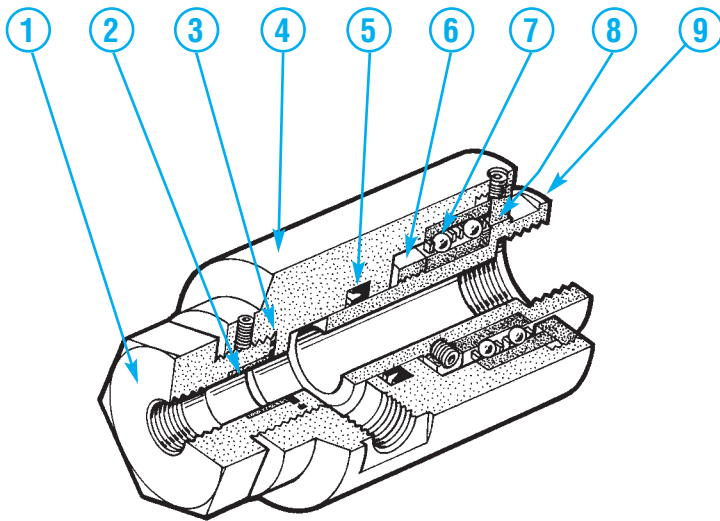
## DIMENSIONS

Nom. Size	Part No.	A & B	C	D	E	Max Press.
6 (1/4")	17699	G. 3/4"	86	65	6.4	400
10 (3/8")	17681	G. 3/8"	86	65	9.5	400
15 (1/2")	17682	G. 1/2"	90	65	12.7	400
20 (3/4")	17683	G. 3/4"	100	75	19.0	400
25 (1")	17684	G. 1"	110	85	25.0	400
32 (1 1/4")	17685	G. 1 1/4"	125	100	32.0	300
40 (1 1/2")	16545	G. 1 1/2"	120	100	38.0	200
50 (2")	16473	G. 2"	135	155	51.0	200

Dimensions in millimetres



'G' is the designation for parallel pipe threads to B.S.2779 and ISO.228/1 (formerly B.S.P. parallel).



## Specification

1. Adaptor - steel
2. Centre tube steady bearing
3. Centre tube seal - ptfе + nitrile rubber
4. Body - steel
5. Seal - polyurethane rubber
6. Locking ring - steel
7. Double row angular contact ball bearing
8. Locking ring - steel
9. Spindle - steel, hard chromed on sealing surface

SPECIALS ARE AVAILABLE SEE PAGE 10

The XP/RS SWIVEL JOINT is a double channel unit generally used for slow continuous rotation and intermittent angular movements.

## Operational Guidelines

### FLUIDS

Water, mineral oils and compressed air.

All fluids must be clean and free of abrasive and corrosive elements.

### PRESSURE

300/400 bar maximum depends on size - see below

### TEMPERATURE

80°C maximum

### SPEED

5 rpm - intermittent

## FLOW CAPACITY

Nominal Size	Liquids *		Air ▲
	m <sup>3</sup> /h	l/min	m <sup>3</sup> /h
2x6 (1/4")	0.25	4	9
2x10 (3/8")	0.56	9	19
2x15 (1/2")	1.61	27	56
2x20 (3/4")	2.65	44	92

\* Flow at a velocity of 3 m/s

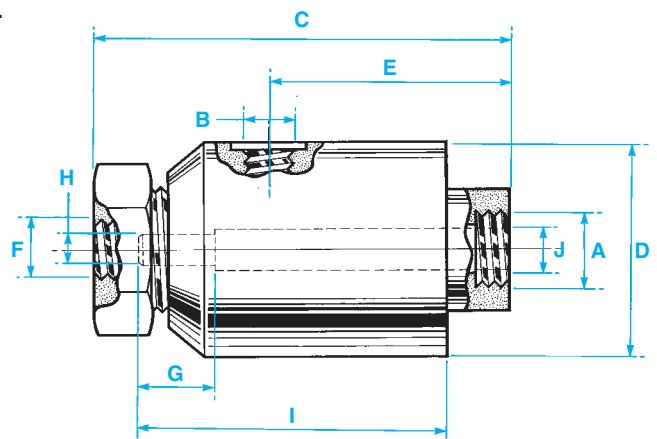
▲ Flow of free air at 15 m/s and 6 bar

## DIMENSIONS

Nom. Size	Part No.	A	B & F	C	D	E	G	H	I	J	Max Press.
2x6 (1/4")	17690	G.1/2"	G.1/4"	118	65	73	25	10	100	13	400
2x10 (3/8")	17691	G.3/4"	G.3/8"	138	75	85	30	16	120	19	
2x15 (1/2")	17692	G.1"	G.1/2"	150	85	90	30	20	130	25	300
2x20 (3/4")	17693	G.1 1/4"	G.3/4"	168	100	105	30	25	140	32	

Dimensions in millimetres

'G' is the designation for parallel pipe threads to B.S.2779 and ISO.228/1 (formerly B.S.P. parallel).



The standard SWIVEL JOINTS shown in this technical manual do not always meet the application required, we do therefore consider other applications.

A simple variation from our standard product may be all that is required. Simple variations can be obtained by adding the suffix code shown below to the standard part number.

We also offer a bespoke service when required. The illustrations shown below and on the opposite page gives some idea of our capabilities.

## SEMI - STANDARDS

### Connections:-

- NPT = American taper pipe threads
- T = 'R' pipe threads (BSP Taper)
- WN = Weldneck ends

### Metal Parts:-

- DS = Bleed port and double seals
- RA = 90° connection - solid body
- RAW = 90° connection - fabricated
- S = Stainless steel type 316

### Seal Materials:-

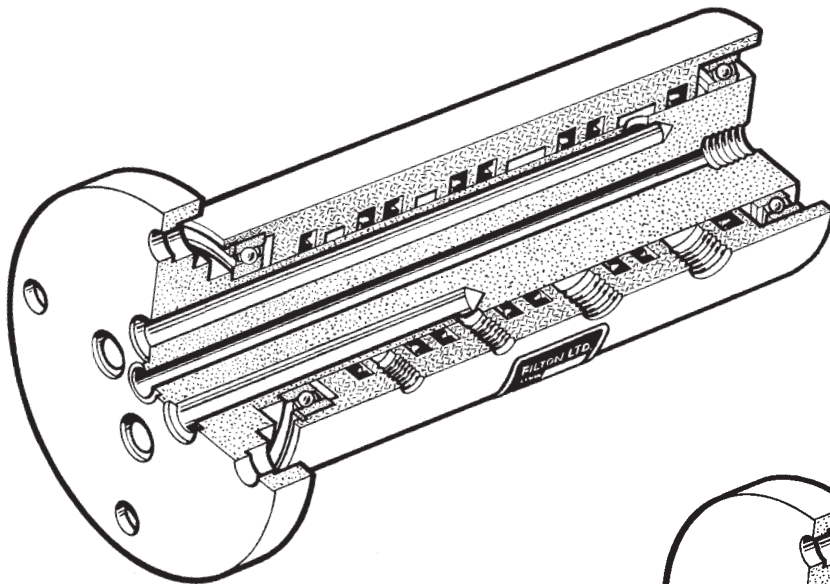
- EP = Ethylene propylene
- N = Nitrile
- PU = Polyurethane
- TF = P.t.f.e base
- V = Fluorocarbon

### Conditions:-

- FQ = Non-toxic contact parts
- VAC = Vacuum service

Flanges are available - please specify the type required.

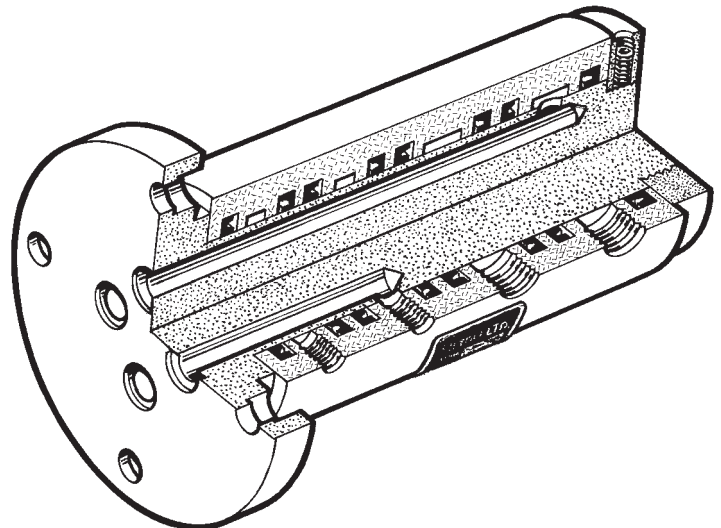
## MULTI-PORT SWIVEL JOINTS



The illustration above shows a four port Swivel Joint with a central bore for electric cable access from a slip ring which can be mounted on the end, or for an additional Swivel Joint service.

This unit is supported by ball bearings for the more arduous duties.

The illustration below shows a four port Swivel Joint for hydraulic service. This is a plain bearing type which is the simplest form.

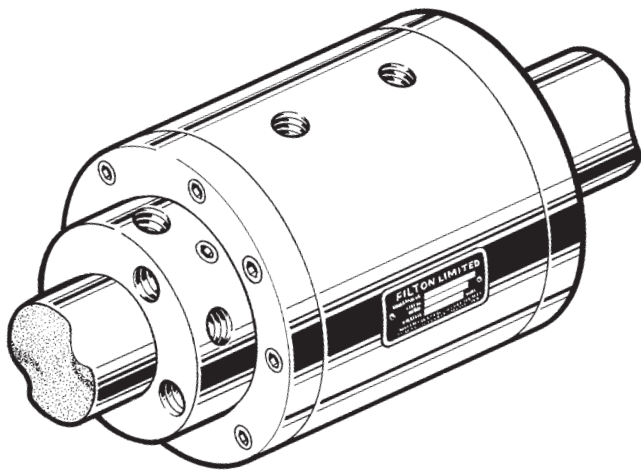
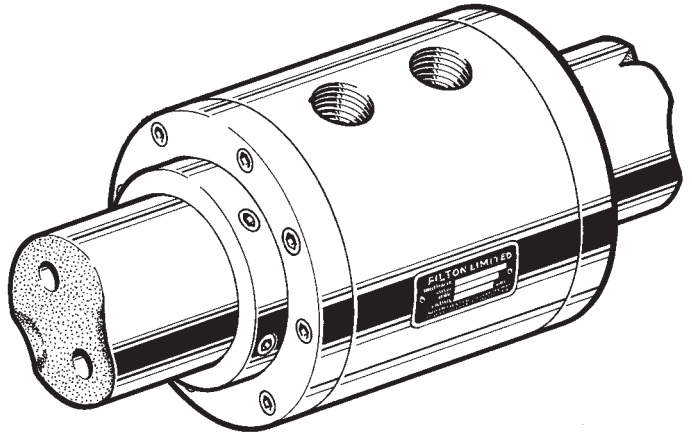


We have designed and manufactured multi-port Swivel Joints weighing up to 1.25 tonne.

## OVERSHAFT SWIVEL JOINTS FOR RADIAL CONNECTION

The illustration on the right shows a two port Overshaft Swivel Joint for fluid transfer through radial ports into the rotating shaft.

Single and multiple port systems are also possible using the same principle.



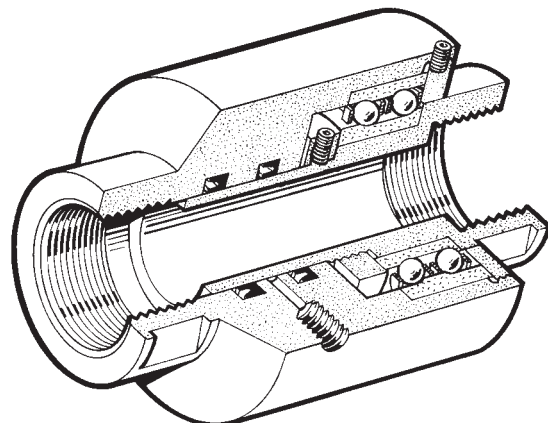
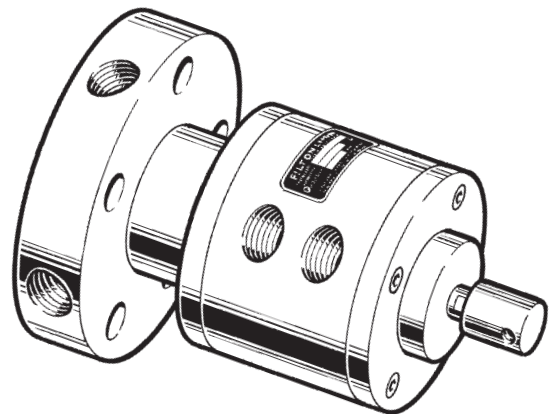
## FOR AXIAL CONNECTION

The illustration on the left shows a two port Overshaft Swivel Joint for fluid transfer through axial ports in the Swivel Joint sleeve which rotates with the shaft.

Alternatively the ports in the sleeve can exit radially outwards.

## PIGGYBACK SWIVEL JOINT

The illustration on the right shows a Piggyback Swivel Joint with two hydraulic ports and one pneumatic port. This principle can be applied to other fluids where intermixing of services could cause problems.



## SWIVEL JOINT - LEAKAGE DETECTION

The illustration on the left shows a Swivel Joint fitted with two seals and having a bleed port between them.

A typical application is for flammable gases where a “sniffer” can be attached to the bleed port to detect leakage from the primary seal.

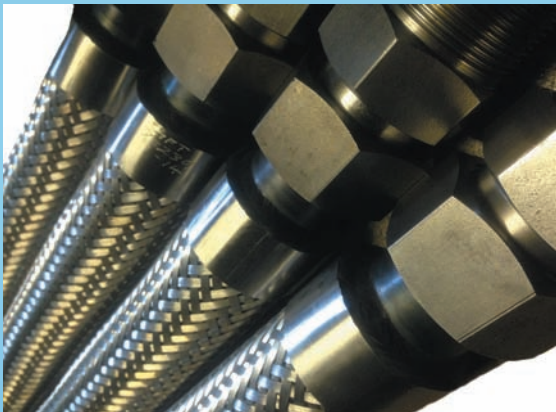
Another use is for some difficult fluids where a compatible barrier fluid can be injected into the bleed port.





### **Air Breather Filters**

Filton air breather filters ensure that there is no dangerous build up of pressure or vacuum due to temperature or volume changes. The high quality sintered element prevents the ingress of air borne foreign particles.



### **Flexible Hoses**

Hoses to carry air, water, gas, steam, hot oil services and low pressure oil are all available. Hoses can be supplied in various lengths with a variety of ends if required including fixed male, swivel male, fixed female, fixed flange and swivel flange.

