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# HAAG+ZEISSLER

## Type P, S & RSP - Ball bearing, bellows system cartridge Series 9000

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<b>Recommended medium</b>	Heat transfer oil, Air, Steam, Water, Non-toxic industrial gases, Lyes (on request)
<b>Available sizes</b>	1/4" - 4"
<b>Max. speed</b>	
<b>ISO 228 thread</b>	1500 RPM (depending on size)
<b>NPT - thread</b>	700 RPM
<b>Max. temperature</b>	
<b>liquid, steam</b>	190°C
<b>air</b>	175°C
<b>Max. pressure</b>	
<b>liquid</b>	17.0 bar
<b>Steam</b>	10.2 bar
<b>Hot oil, air</b>	6.8 bar



- + **Single input/output line**
- + **Series with ball bearings and bellows sealing assembly**
- + **Available in stainless steel**
- + **CD-Cartridge-Design**

*The 9000 Series ROTARY UNIONS are designed for universal use and are suitable both for cooling and heating rollers. They can be used for steam, water, heat transfer oils, air and many other media.*

*The unique construction of this range, combining a bellows unit, ball-bearings and a CD-cartridge design (fast-change seal cartridge system), make this rotary union a classic in the engineering field.*

*The main sealing materials used are hardened stainless steel and graphite. Ceramic parts can also be supplied on request for abrasive media. The standard version of the housing and rotor is steel, but they are also available in stainless steel. Maintenance-free versions with dry-lubricated ball bearings and/or stainless steel bearings designed to withstand temperatures up to 315 °C are available for heat transfer oils (PRL, SRL and RSRL).*

*The 9000 Series comes in sizes ranging from 1/4" to 4" (DN 8 - DN 100). All the devices can be fitted with connecting flanges.*

*Rotors with flanges are recommended for reverse operation.*

*Contact HAAG + ZEISSLER Maschinenelemente GmbH before running the rotary*

## Type P Single passage union



Size	Rotary Union Ordering codes type P					
	ISO 228-thread		NPT-thread		DIN 2566	SV-Shaft (quickrelease)
Connection A rotor	LH left	RH right	LH left	RH right	welded Flange	
1/4"	990001	990002	990023	990024	990045	990056
3/8"	990003	990004	990025	990026	990046	990057
1/2"	990005	990006	990027	990028	990047	990058
3/4"	990007	990008	990029	990030	990048	990059
1"	990009	990010	990031	990032	990049	990060
1 1/4"	990011	990012	990033	990034	990050	990061
1 1/2"	990013	990014	990035	990036	990051	990062
2"	990015	990016	990037	990038	990052	990063
2 1/2"	990017	990018	990039	990040	990053	990064
3"	990019	990020	990041	990042	990054	990065
4"	990021	990022	990043	990044	990055	990066

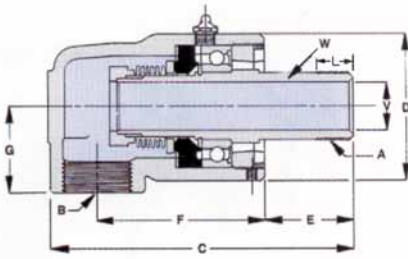
Size	Cartridges Ordering codes					
	ISO 228-thread		NPT-thread		DIN 2566	SV-Shaft (quickrelease)
Rotor Connection A rotor	LH left	RH right	LH left	RH right	welded Flange	
1/4"	990300	990301	441646	441647	990322	990333
3/8"	990302	990303	441658	441659	990323	990334
1/2"	990304	990305	441629	441630	990324	990335
3/4"	990306	990307	441596	441597	990325	990336
1"	990308	990309	441578	441579	990326	990337
1 1/4"	990310	990311	471459	471460	990327	990338
1 1/2"	990312	990313	471363	471364	990328	990339
2"	990314	990315	471553	471554	990329	990340
2 1/2"	990316	990317	471555	471556	990330	990341
3"	990320	990321	471557	471558	990331	990342
4"	990348	990349	990344	990345	990332	990343

SV = Quickrelease shaft for connecting quickrelease flanges

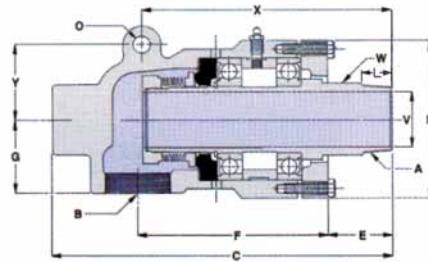
Stationary connections of the rotating joints are delivered, as standard, with the same thread norm as connection A

Other flanges on request

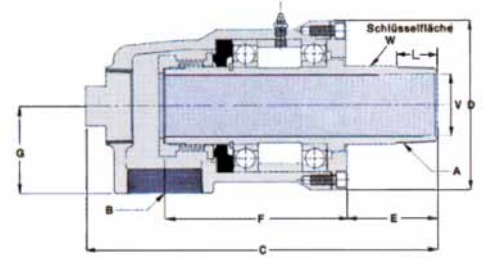
## Type P Single passage union



1/4" - 1 1/2"



2"



2 1/2" - 4"

Size	Connection A		Thread B ISO 228	C mm	D mm	E mm	F mm	L mm	V mm	W* mm	G mm	O mm	Y mm	X mm
		ISO 228												
1/4"	/ left	G 1/4" LH	G 1/4"	111	44	29	65	13	6	16	27			
	/ right	G 1/4" RH												
3/8"	/ Flange	DIN 2566	G 3/8"	111	44	29	65	11	10	17	27			
	/ SV-Flange	1/4" (SV)												
1/2"	/ left	G 1/2" LH	G 1/2"	126	60	38	70	12,4	13	24	32			
	/ right	G 1/2" RH												
3/4"	/ Flange	DIN 2566	G 3/4"	136	64	39	76	16	19	28	37			
	/ SV-Flange	3/4" (SV)												
1"	/ left	G 1" LH	G 1"	156	76	42	86	17	25	34	44			
	/ right	G 1" RH												
1 1/4"	/ Flange	DIN 2566	G 1 1/4"	227	95	49	122	20	32	43	56	16	51	171
	/ SV-Flange	1 1/4" (SV)												
1 1/2"	/ left	G 1 1/2" LH	G 1 1/2"	260	105	70	133	21	38	49	56	16	57	202
	/ right	G 1 1/2" RH												
2"	/ Flange	DIN 2566	G 2"	298	149	62	164	25	51	65	67	16	70	215
	/ SV-Flange	2" (SV)												
2 1/2"	/ left	G 2 1/2" LH	G 2 1/2"	350	165	89	183	24	64	76	86			
	/ right	G 2 1/2" RH												
3"	/ Flange	DIN 2566	G 3"	390	181	89	211	39	76	92	98			
	/ SV-Flange	3" (SV)												
4"	/ left	G 4" LH	G 4"	625	215	85	460	39	98	118	85	customer specific		
	/ right	G 4" RH												
	/ Flange	DIN 2566												
	/ SV-Flange	4" (SV)												

The connections A and B are also with NPT-Thread available.

## Type S Double passage with stationary syphon pipe



Rotary Union Ordering codes type S

Rotor Connection A rotor	ISO 228-thread		NPT-thread		DIN 2566	SV-Shaft (quickrelease)
	LH left	RH right	LH left	RH right	welded Flange	
3/8"	990067	990068	990085	990086	990103	990112
1/2"	990069	990070	990087	990088	990104	990113
3/4"	990071	990072	990089	990090	990105	990114
1"	990073	990074	990091	990092	990106	990115
1 1/4"	990075	990076	990093	990094	990107	990116
1 1/2"	990077	990078	990095	990096	990108	990117
2"	990079	990080	990097	990098	990109	990118
2 1/2"	990081	990082	990099	990100	990110	990119
3"	990083	990084	990101	990102	990111	990120
4"	990765	990766	990767	990768	990769	990770

Cartridges Ordering codes

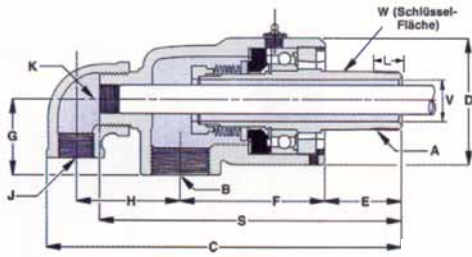
Rotor Connection A rotor	ISO 228-thread		NPT-thread		DIN 2566	SV-Shaft (quickrelease)
	LH left	RH right	LH left	RH right	welded Flange	
3/8"	990302	990303	441658	441659	990323	990334
1/2"	990304	990305	441629	441630	990324	990335
3/4"	990306	990307	441596	441597	990325	990336
1"	990308	990309	441578	441579	990326	990337
1 1/4"	990310	990311	471459	471460	990327	990338
1 1/2"	990312	990313	471363	471364	990328	990339
2"	990314	990315	471553	471554	990329	990340
2 1/2"	990316	990317	471555	471556	990330	990341
3"	990320	990321	471557	471558	990331	990342
4"	990348	990349	990344	990345	990332	990343

SV = Quickrelease shaft for connecting quickrelease flanges

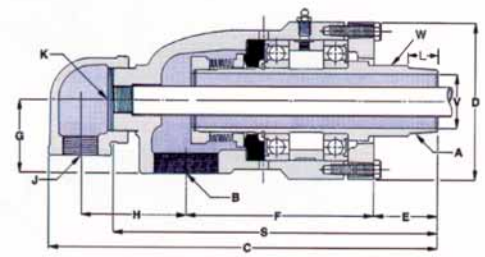
Stationary connections of the rotating joints are delivered, as standard, with the same thread norm as connection A

Other flanges on request

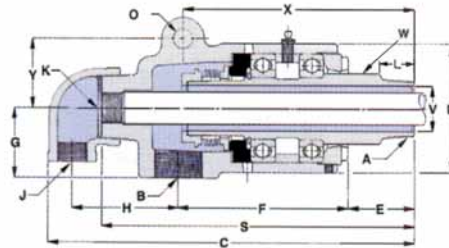
## Type S Double passage with stationary syphon pipe



1/2" - 1"



2 1/2" - 4"



1 1/4" - 2"

Size	Connection A		Thread B ISO 228	Thread J ISO 228	Thread K ISO 228	C mm	D mm	E mm	F mm	L mm	V mm	W mm	G mm	H mm	S mm	O mm	Y mm	X mm	
	/ left	/ right																	ISO 228
3/8"	/ left / right / Flange / SV-Flange	G 3/8" LH G 3/8" RH DIN 2566 3/8" (SV)	G 3/8"	G 3/8"	G 1/8"	130	44	29	65	11	10	17	27	29	107				
1/2"	/ left / right / Flange / SV-Flange	G 1/2" LH G 1/2" RH DIN 2566 1/2" (SV)	G 1/2"	G 1/2"	G 1/8"	184	60	38	70	12	13	24	32	54	152				
3/4"	/ left / right / Flange / SV-Flange	G 3/4" LH G 3/4" RH DIN 2566 3/4" (SV)	G 3/4"	G 1/2"	G 1/4"	197	64	39	76	16	19	28	37	60	162				
1"	/ left / right / Flange / SV-Flange	G 1" LH G 1" RH DIN 2566 1" (SV)	G 1"	G 1/2"	G 3/8"	216	76	42	86	17	25	34	44	67	175				
1 1/4"	/ left / right / Flange / SV-Flange	G 1 1/4" LH G 1 1/4" RH DIN 2566 1 1/4" (SV)	G 1 1/4"	G 1/2"	G 1/2"	270	95	51	122	20	32	43	51	76	230	16	51	171	
1 1/2"	/ left / right / Flange / SV-Flange	G 1 1/2" LH G 1 1/2" RH DIN 2566 1 1/2" (SV)	G 1 1/2"	G 3/4"	G 3/4"	303	105	56	133	21	38	49	56	83	250	16	57	183	
2"	/ left / right / Flange / SV-Flange	G 2" LH G 2" RH DIN 2566 2" (SV)	G 2"	G 1"	G 3/4"	360	149	62	164	25	51	65	67	103	300	16	70	215	
2 1/2"	/ left / right / Flange / SV-Flange	G 2 1/2" LH G 2 1/2" RH DIN 2566 2 1/2" (SV)	G 2 1/2"	G 1 1/2"	G 1"	429	165	89	184	24	64	76	86	127	356				
3"	/ left / right / Flange / SV-Flange	G 3" LH G 3" RH DIN 2566 3" (SV)	G 3"	G 2"	G 1 1/4"	482	181	89	211	40	76	92	98	155	397				
4"	/ left / right / Flange / SV-Flange	G 4" LH G 4" RH DIN 2566 4" (SV)	G 4"	G 3"	G 2"	640	215	85	260	40	98	118	85	210	522	customer specific			

The connections A, B and J are also with NPT-Thread available.

## Type RSP Double passage with rotating syphon tube



Size	Rotary Union Ordering codes type RSP						
	ISO 228-thread		NPT-thread		DIN 2566	SV-Shaft (quickrelease)	
	Connection A rotor	LH left	RH right	LH left	RH right		welded Flange
3/8"		990121	990122	990139	990140	990157	990166
1/2"		990123	990124	990141	990142	990158	990167
3/4"		990125	990126	990143	990144	990159	990168
1"		990127	990128	990145	990146	990160	990169
1 1/4"		990129	990130	990147	990148	990161	990170
1 1/2"		990131	990132	990149	990150	990162	990171
2"		990133	990134	990151	990152	990163	990172
2 1/2"		990135	990136	990153	990154	990164	990173
3"		990137	990138	990155	990156	990165	990174
4"		990459	990460	990461	990462	990463	990464

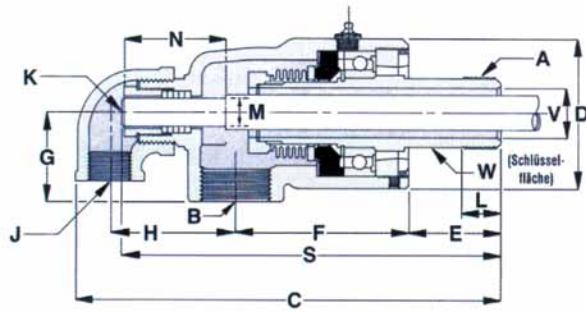
Size	Cartridges Ordering codes						
	ISO 228-thread		NPT-thread		DIN 2566	SV-Shaft (quickrelease)	
	Connection A rotor	LH left	RH right	LH left	RH right		welded Flange
3/8"		990302	990303	441658	441659	990323	990334
1/2"		990304	990305	441629	441630	990324	990335
3/4"		990306	990307	441596	441597	990325	990336
1"		990308	990309	441578	441579	990326	990337
1 1/4"		990310	990311	471459	471460	990327	990338
1 1/2"		990312	990313	471363	471364	990328	990339
2"		990314	990315	471553	471554	990329	990340
2 1/2"		990316	990317	471555	471556	990330	990341
3"		990320	990321	471557	471558	990331	990342
4"		990348	990349	990344	990345	990332	990343

SV = Quickrelease shaft for connecting quickrelease flanges

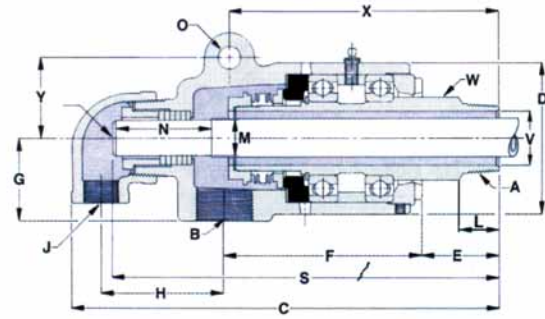
Stationary connections of the rotating joints are delivered, as standard, with the same thread norm as connection A

Other flanges on request

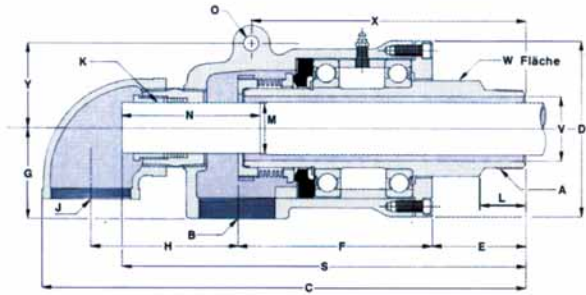
## Type RSP Double passage with rotating syphon tube



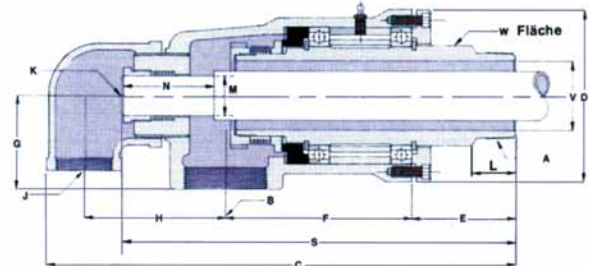
1/2" - 1"



1 1/4" - 1 1/2"



2"



2 1/2" - 4"

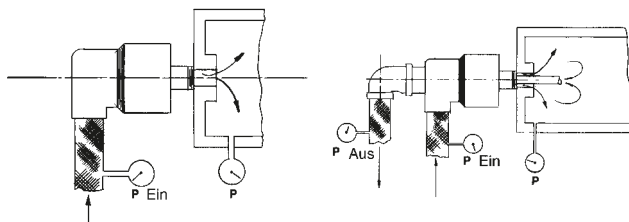
Size	Connection A		Thread B	Thread J	syphon tube K	M	N	C	D	E	F	L	V	W	G	H	S	O	Y	X	
	/ left	/ right	ISO 228	ISO 228		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3/8"	/ left / right / Flange / SV-Flange	3/8" 3/8" DIN 2566 3/8" (SV)	G 3/8"	G 3/8"	6,3 mm	5,9	35,0	130	45	29	65	11	10	17	27	29	107				
1/2"	/ left / right / Flange / SV-Flange	1/2" 1/2" DIN 2566 1/2" (SV)	G 1/2"	G 1/2"	1/8"	9,4	41,0	184	60	38	70	12	13	24	32	54	159				
3/4"	/ left / right / Flange / SV-Flange	3/4" 3/4" DIN 2566 3/4" (SV)	G 3/4"	G 1/2"	1/4"	13,0	44,0	197	64	39	76	16	19	28	37	60	163				
1"	/ left / right / Flange / SV-Flange	1" 1" DIN 2566 1" (SV)	G 1"	G 1/2"	3/8"	16,0	51,0	216	76	42	86	17	25	34	44	67	196				
1 1/4"	/ left / right / Flange / SV-Flange	1 1/4" 1 1/4" DIN 2566 1 1/4" (SV)	G 1 1/4"	G 1/2"	1/2"	20,0	76,0	270	95	51	122	20	32	43	51	76	245	16	51	171	
1 1/2"	/ left / right / Flange / SV-Flange	1 1/2" 1 1/2" DIN 2566 1 1/2" (SV)	G 1 1/2"	G 3/4"	3/4"	25,0	83,0	303	105	56	133	21	38	49	56	83	265	16	57	183	
2"	/ left / right / Flange / SV-Flange	2" 2" DIN 2566 2" (SV)	G 2"	G 1"	3/4"	25,0	83,0	360	149	62	164	25	51	65	67	103	315	16	70	215	
2 1/2"	/ left / right / Flange / SV-Flange	2 1/2" 2 1/2" DIN 2566 2 1/2" (SV)	G 2 1/2"	G 1 1/2"	1"	31,5	95,0	429	165	89	184	24	64	76	86	127	371				
3"	/ left / right / Flange / SV-Flange	3" 3" DIN 2566 3" (SV)	G 3"	G 2"	1 1/4"	41,1	108,0	482	181	89	211	40	76	92	98	150	412				
4"	/ left / right / Flange / SV-Flange	4" 4" DIN 2566 4" (SV)	G 4"	G 3"	2"	58,5	120,0	625	215	85	460	40	98	118	85	198	530	customer specific			

The connections A, B and J are also with NPT-Thread available.



## Types P, S, RSP Technical data

Single passage union type P		
size	Surface shaft cm <sup>2</sup>	CV dm <sup>3</sup> /min
1/4"	0,32	29,7
3/8"	0,72	42,5
1/2"	1,26	75,7
3/4"	2,85	170,1
1"	5,06	302,8
1 1/4"	7,91	475,8
1 1/2"	11,4	677,7
2"	20,25	1211,2
2 1/2"	28,57	1629,4
3"	41,86	2494,5
4"	81,08	4830,4



$$\Delta p = (Q/KV)^2$$

Q = Flow rate in liters per minute (water)

$\Delta p$  = Pressure drop (bar)

CV = drop factor in litres of water per minute with a 1 bar pressure drop

Double passage union type S and RSP						
size	Size syphon pipe	Shaft area cm <sup>2</sup>	CV in dm <sup>3</sup> /min	syphon area cm <sup>2</sup>	CV out dm <sup>3</sup> /min	CV in/out dm <sup>3</sup> /min
3/8"	1/8"	0,64	36,1	0,03	1,6	1,6
	3/16"	0,54	30,3	0,08	5,1	4,9
	1/4"	0,4	23,1	0,16	10,5	9,7
1/2"	1/4"	0,95	54,8	0,16	10,5	10,4
	1/8"	0,44	24,5	0,37	23,1	16,7
3/4"	1/8"	2,01	116,8	0,37	23,1	22,6
	1/4"	1,37	79,3	0,67	43,3	38,1
	3/8"	0,54	30,3	1,23	80,8	28,4
1"	1/8"	4,23	245,1	0,37	23,1	22,9
	1/4"	3,59	201,9	0,67	43,3	42,4
	3/8"	2,76	158,6	1,23	80,8	72,1
	1/2"	1,49	86,5	1,96	128,3	72,1
1 1/4"	1/8"	7,08	403,7	0,37	23,1	23,1
	1/4"	6,44	374,9	0,67	43,3	42,8
	3/8"	5,61	317,2	1,23	80,8	78,3
	1/2"	4,34	245,1	1,96	128,3	113,6
	3/4"	2,34	135,5	3,44	216,3	115,4
1 1/2"	1/4"	9,92	576,8	0,67	28,8	28,8
	3/8"	9,09	519,1	1,23	80,8	79,7
	1/2"	7,8	447,0	1,96	129,8	124,0
	3/4"	5,8	331,6	3,44	216,3	180,0
	1"	2,64	144,2	5,57	331,6	132,7
2"	3/8"	18,0	1038,2	1,23	80,8	82,2
	1/2"	16,7	966,1	1,96	129,1	129,1
	3/4"	14,7	950,7	3,44	216,3	212,0
	1"	11,5	663,2	5,57	331,6	299,9
	1 1/4"	6,31	360,5	9,65	634,4	314,3
2 1/2"	1/2"	25,0	1441,9	1,96	129,8	129,8
	3/4"	23,0	1326,5	3,44	216,3	213,4
	1"	19,8	1153,5	5,57	331,6	320,1
	1 1/4"	14,6	850,7	9,65	634,4	507,5
	1 1/2"	10,3	591,2	13,14	865,1	488,8
2 1/2" Flansch	2"	3,08	173,0	21,65	1413,1	170,1
3"	1/2"	38,3	2220,5	1,96	128,3	128,3
	3/4"	36,3	2105,2	3,44	216,3	214,8
	1"	33,12	1917,7	5,57	331,6	331,6
	1 1/4"	27,92	1614,9	9,65	634,4	586,9
	1 1/2"	26,5	1542,8	13,14	850,7	749,8
	2"	13,3	764,2	21,65	1413,1	673,4
3" Flansch	2 1/2"	3,72	216,3	30,9	2018,7	201,9
4"	1 1/4"	67,1	5335,0	9,65	634,4	625,8
	1 1/2"	62,8	3662,0	13,14	850,7	836,3
	2"	52,5	3056,8	21,65	1413,1	1283,3
	2 1/2"	39,19	2278,2	30,9	2018,7	1528,4
	3"	19,0	1095,8	47,7	3114,5	1033,8



## Types P, S, RSP Technical data

PN-table											
size	Water, steam, oil	Water, steam, oil	air	steam		heat transfer oil		water		air	
	Max. speed ISO 228 thread 1/min	Max. speed NPT thread 1/min	max. speed 1/min	max. pressure bar	max. PN bar x 1/min	max. pressure bar	max. PN bar x 1/min	max. pressure bar	max. PN bar x 1/min	max. pressure bar	max. PN bar x 1/min
1/4"	1500	700	320	10,2	5862	6,8	13103	17,0	13103	6,8	572
3/8"	1500	700	320	10,2	5862	6,8	13103	17,0	13103	6,8	572
1/2"	1200	700	240	10,2	5862	6,8	13103	17,0	13103	6,8	428
3/4"	1000	700	210	10,2	5862	6,8	13103	17,0	13103	6,8	372
1"	1000	700	170	10,2	5862	6,8	13103	17,0	13103	6,8	317
1 1/4"	1000	500	140	10,2	4621	6,8	10345	17,0	10345	6,8	248
1 1/2"	900	500	118	10,2	4621	6,8	9517	17,0	9517	6,8	207
2"	800	500	90	10,2	1586	6,8	3586	17,0	3586	6,8	159
2 1/2"	700	500	77	10,2	1379	6,8	3103	17,0	3103	6,8	138
3"	600	500	67	10,2	759	6,8	1655	17,0	1655	6,8	117
4"	500	-	56	10,2	759	6,8	1655	17,0	1655	6,8	103

The PN means pressure (bar) multiplied with speed (rpm). It is an indicator for the using time of the rotating joint, at prescribed using, clean medium and prescribed maintenance. At first you must calculate the size of the union. Then you calculate the PN in multiply pressure in bar with RPM. Is the result lower as the value in the tabulation for the medium you need, so you have the ideal using time of the union.

## Types P, S, RSP Parts



parts ordering codes

size	ball bearing shaft with:						ball bearings	bearing retainer	seal ring	bellows gasket	bellows assembly	housing gasket	grease ring
	ISO 228-thread left	ISO 228-thread right	NPT-thread left	NPT-thread right	welded flange DIN 2566	quick release							
1/4"	990350	990351	463474	463475	990372	990383	482020	847022	463472	982033	481192	982026	-
3/8"	999352	990353	463484	463485	990373	990384	482020	847022	463472	982033	481192	982026	-
1/2"	990354	990355	463428	463429	990374	990385	482076	854744	463426	982090	481019	982083	-
3/4"	990356	990357	463291	463292	990375	990386	482134	844654	463287	982148	481036	482141	-
1"	990358	990359	463265	463266	990376	990387	482188	844341	463264	982201	481049	982195	-
1 1/4"	990360	990361	485070	485071	990377	990388	482241*	854753	482246	982255	481062	982248	483206
1 1/2"	990362	990363	483951	483952	990378	990389	482303*	863095	482308	982316	481073	982310	484088
2"	990364	990365	485181	485182	990379	990390	482362*	854757	482786	982788	481247	982787	484094
2 1/2"	990366	990367	485256	485257	990380	990391	482809*	854762	482811	982813	481268	982812	482990
3"	990368	990369	485155	485156	990381	990392	482389*	854766*	482841	982843	481289	982842	471230
4"	990370	990371	990394	990395	990382	990393	482477*	483637	482486	982482	481312	982478	471231

\* two parts per joint

The ordering codes of complete repair cartridges you find on the pages of the various types.