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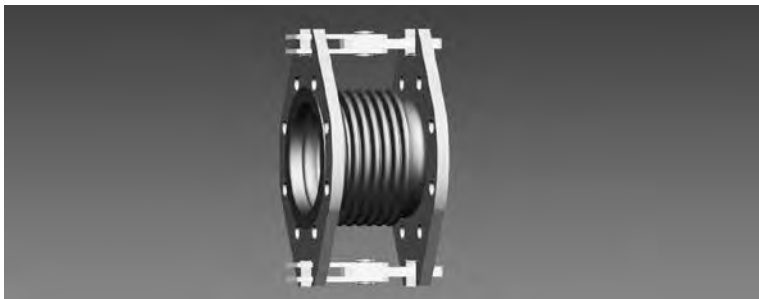
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Oil & Gas

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ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES TYPE WBN, WBK

06



Type designation

The type designation consists of 2 parts

1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example

Type WBN:

HYDRA single hinge angular expansion joint with loose flanges

Type WBK:

HYDRA gimbal hinge angular expansion joint with loose flanges

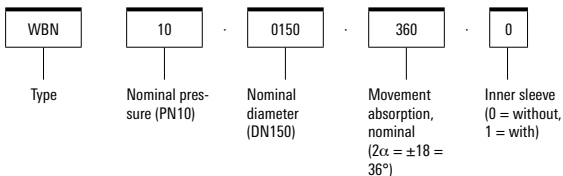
Standard version/materials:

Multi-ply bellows made of 1.4541

Flange made of P265GH (1.0425)

Operating temperature: up to 400 °C

Type designation (example)



Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions

- Type designation or order number

With material variation

- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

06

Type of pressure equipment according to Art. 1 & 2:

- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:

- Group 1 – dangerous
- Group 2 – all other fluids

State of medium

- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:

- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

Optional:

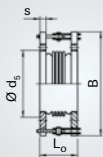
- Category _____

Note

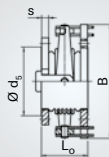
Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES

Type WBN



Type WBK



06

Nominal diameter	Nominal angular movement absorption	Type WBN 06... WBK 06...	Order No. standard version		WBN		WBK	
			WBN	WBK	overall length	weight approx.	overall length	weight approx.
DN	2α _N	–	–	–	L _o	G	L _o	G
–	degree	–	–	–	mm	kg	mm	kg
50	33	.0050.330.0	441221	441136	121	7	121	11
50	41	.0050.410.0	441222	441137	141	7	141	11
65	27	.0065.270.0	441223	441138	111	9	111	13
65	39	.0065.390.0	441224	441139	141	9	141	13
80	27	.0080.270.0	441225	441140	121	11	121	16
80	38	.0080.380.0	441226	441141	151	12	151	17
100	27	.0100.270.0	441227	441142	131	12	131	17
100	38	.0100.380.0	441228	441143	161	12	161	18
125	30	.0125.300.0	441229	441144	151	15	151	21
125	39	.0125.390.0	441230	441145	181	16	181	22
150	23	.0150.230.0	441231	441146	162	16	162	23
150	36	.0150.360.0	441232	441147	212	18	212	24
200	23	.0200.230.0	441233	441148	172	22	172	33
200	34	.0200.340.0	441234	441149	233	25	233	35
250	18	.0250.180.0	441235	441150	183	29	183	40
250	32	.0250.320.0	441236	441151	253	31	253	43
300	19	.0300.190.0	441237	-	183	38	-	-
300	34	.0300.340.0	441238	441153	263	41	263	59

SINGLE HINGE VERSION TYPE WBN 06 ... GIMBAL HINGE VERSION TYPE WBK 06 ...

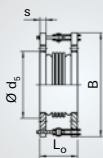
PN 6

06

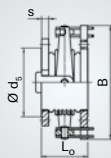
Max. width approx.	Flange			Spring rate		
	drilling DIN 1092	rim diameter	thickness	c_r	c_c	c_p
B	PN	d_s	s	c_r	c_c	c_p
mm	-	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
250	6	90	16	0.5	1.1	0.1
250	6	90	16	0.5	0.8	0.1
285	6	107	16	0.7	1.9	0.1
285	6	107	16	0.7	1.2	0.1
310	6	122	18	0.9	2.3	0.1
310	6	122	18	0.9	1.5	0.2
325	6	147	18	1.4	3.3	0.2
325	6	147	18	1.4	2.1	0.4
355	6	178	20	1.9	3	0.4
355	6	178	20	1.9	2.1	0.5
370	6	202	20	2.6	8.5	0.5
370	6	202	20	2.6	4.7	1.0
425	6	258	22	4	13	1.0
425	6	258	22	4	15	1.7
485	6	312	24	7	39	1.4
485	6	312	24	7	20	2.8
565	6	365	24	9	47	2.2
565	6	365	24	9	24	4.3

ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES

Type WBN



Type WBK



Nominal diameter	Nominal angular movement absorption	Type WBN 06... WBK 06...	Order No. standard version		WBN		WBK	
			WBN	WBK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	–	–	–	L_o	G	L_o	G
–	degree	–	–	–	mm	kg	mm	kg
350	18	.0350.180.0	441239	-	193	61	-	-
350	34	.0350.340.0	441240	441155	314	69	314	101
400	13	.0400.130.0	441241	-	213	68	-	-
400	27	.0400.270.0	441242	441157	343	77	343	116
450	13	.0450.130.0	441243	-	213	76	-	-
450	24	.0450.240.0	441244	441158	333	85	333	134
500	14	.0500.140.0	441245	-	224	86	-	-
500	26	.0500.260.0	441246	441159	354	99	354	159
600	13	.0600.130.0	441247	-	254	155	-	-
600	25	.0600.250.0	441248	441160	394	175	394	290
700	14	.0700.140.0	441249	-	284	176	-	-
700	25	.0700.250.0	441250	441161	446	220	446	383
800	11	.0800.110.0	441251	-	296	242	-	-
800	23	.0800.230.0	441252	441162	496	286	496	501

SINGLE HINGE VERSION TYPE WBN 06 ... GIMBAL HINGE VERSION TYPE WBK 06 ...

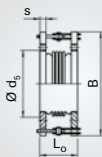
PN 6

06

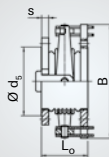
Max. width approx.	Flange			Spring rate		
	drilling DIN 1092	rim diameter	thickness			
B	PN	d_s	s	c_r	c_s	c_p
mm	-	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
650	6	410	26	20	65	2.7
650	6	410	26	20	35	6.4
680	6	465	28	26	146	3.7
680	6	465	28	26	58	9.3
740	6	520	28	33	186	4.9
740	6	520	28	33	83	11.0
800	6	570	28	41	260	6.6
800	6	570	28	41	116	15.0
950	6	670	37	77	370	10.0
950	6	670	37	77	164	24.0
1060	6	775	37	104	422	18.0
1060	6	775	37	104	308	38.0
1180	6	880	43	135	1002	22.0
1180	6	880	43	135	401	54.0

ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES

Type WBN



Type WBK



Nominal diameter	Nominal angular movement absorption	Type WBN 10... WBK 10...	Order No. standard version		WBN		WBK	
			WBN	WBK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
50	31	.0050.310.0	441253	441163	131	10	131	14
50	37	.0050.370.0	441254	441164	151	10	151	14
65	26	.0065.260.0	441255	441165	121	11	121	16
65	37	.0065.370.0	441256	441166	162	12	162	16
80	25	.0080.250.0	441257	441167	132	12	132	18
80	36	.0080.360.0	441258	441168	162	13	162	18
100	26	.0100.260.0	441259	441169	142	15	142	21
100	36	.0100.360.0	441260	441170	182	16	182	22
125	25	.0125.250.0	441261	441171	162	18	162	23
125	34	.0125.340.0	441262	441172	202	19	202	25
150	23	.0150.230.0	441263	441173	173	23	173	32
150	36	.0150.360.0	441264	441174	233	24	233	34
200	22	.0200.220.0	441265	441175	183	29	183	40
200	32	.0200.320.0	441266	441176	234	31	234	42
250	18	.0250.180.0	441267	441177	183	46	183	70
250	30	.0250.300.0	441268	441178	264	51	264	75
300	23	.0300.230.0	441269	-	224	57	-	-
300	29	.0300.290.0	441270	441180	264	60	264	91

SINGLE HINGE VERSION TYPE WBN 10 ... GIMBAL HINGE VERSION TYPE WBK 10 ...

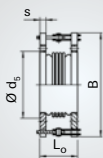
PN 10

06

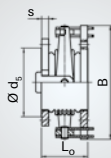
Max. width approx.	Flange			Spring rate		
	drilling DIN 1092	rim diameter	thickness			
B	PN	d_s	s	c_r	c_s	c_p
mm	-	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
275	16	92	19	0.5	1.1	0.1
275	16	92	19	0.5	0.8	0.1
295	16	107	20	0.7	1.9	0.1
295	16	107	20	0.7	1.8	0.2
310	16	122	20	0.9	3.8	0.1
310	16	122	20	0.9	2.4	0.2
335	16	147	22	1.4	4.9	0.2
335	16	147	22	1.4	3.1	0.4
355	16	178	22	1.8	6	0.4
355	16	178	22	1.8	3.8	0.6
385	16	208	24	2.6	15	0.6
385	16	208	24	2.6	8.4	1.0
450	10	258	24	4	23	1.1
450	10	258	24	4	17	1.7
540	10	320	26	12	39	1.4
540	10	320	26	12	22	3.0
600	10	370	28	17	45	2.9
600	10	370	28	17	32	4.0

ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES

Type WBN



Type WBK



Nominal diameter	Nominal angular movement absorption	Type WBN 10... WBK 10...	Order No. standard version		WBN		WBK	
			WBN	WBK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	–	–	–	L_o	G	L_o	G
–	degree	–	–	–	mm	kg	mm	kg
350	17	.0350.170.0	441271	-	204	68	-	-
350	26	.0350.260.0	441272	441181	274	73	274	113
400	12	.0400.120.0	441273	-	226	92	-	-
400	26	.0400.260.0	441274	441182	376	108	376	162
450	13	.0450.130.0	441275	-	246	115	-	-
450	25	.0450.250.0	441276	441183	366	131	366	204
500	14	.0500.140.0	441277	-	256	153	-	-
500	25	.0500.250.0	441278	441184	386	174	386	274
600	12	.0600.120.0	441279	-	276	193	-	-
600	23	.0600.230.0	441280	441185	416	219	416	378

SINGLE HINGE VERSION TYPE WBN 10 ... GIMBAL HINGE VERSION TYPE WBK 10 ...

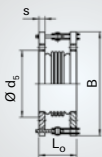
PN 10

06

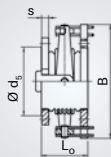
Max. width approx.	Flange			Spring rate		
	drilling DIN 1092	rim diameter	thickness			
B	PN	d_s	s	c_r	c_s	c_p
mm	-	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
660	10	410	28	20	78	2.8
660	10	410	28	20	45	5.0
710	10	465	32	26	297	4.1
710	10	465	32	26	119	10.0
810	10	520	37	33	362	5.4
810	10	520	37	33	161	12.0
860	10	570	37	55	395	7.1
860	10	570	37	55	176	16.0
980	10	670	43	77	581	11.0
980	10	670	43	77	259	24.0

ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES

Type WBN



Type WBK



06

Nominal diameter	Nominal angular movement absorption	Type WBN 16... WBK 16...	Order No. standard version		WBN		WBK	
			WBN	WBK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
50	25	.0050.250.0	441281	441186	122	10	122	15
50	34	.0050.340.0	441282	441187	152	10	152	15
65	25	.0065.250.0	441283	441188	132	11	132	16
65	34	.0065.340.0	441284	441189	163	12	163	17
80	23	.0080.230.0	441285	441190	143	13	143	18
80	32	.0080.320.0	441286	441191	173	14	173	19
100	24	.0100.240.0	441287	441192	153	16	153	23
100	33	.0100.330.0	441288	441193	183	17	183	24
125	24	.0125.240.0	441289	441194	163	19	163	27
125	33	.0125.330.0	441290	441195	214	20	214	29
150	22	.0150.220.0	441291	441196	173	23	173	33
150	31	.0150.310.0	441292	441197	224	25	224	34
200	22	.0200.220.0	441293	441198	195	43	195	64
200	31	.0200.310.0	441294	441199	245	46	245	67
250	14	.0250.140.0	441295	441200	214	53	214	82
250	23	.0250.230.0	441296	441201	285	60	285	89
300	15	.0300.150.0	441297	-	235	76	-	-
300	22	.0300.220.0	441298	441202	325	83	325	123
350	12	.0350.120.0	441299	-	215	98	-	-
350	19	.0350.190.0	441300	441203	305	106	305	161

SINGLE HINGE VERSION TYPE WBN 16 ... GIMBAL HINGE VERSION TYPE 16 ...

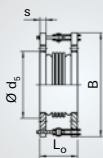
PN 16

06

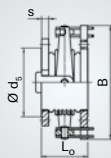
Max. width approx.	Flange			Spring rate		
	drilling DIN 1092	rim diameter	thickness	c_r	c_c	c_p
B	PN	d_s	s	c_r	c_c	c_p
mm	-	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
275	16	92	19	0.5	2.2	0.1
275	16	92	19	0.5	1.4	0.1
295	16	107	20	0.7	2.9	0.1
295	16	107	20	0.7	3.3	0.2
310	16	122	20	0.9	6.9	0.2
310	16	122	20	0.9	4.3	0.3
335	16	147	22	1.4	8.8	0.3
335	16	147	22	1.4	5.5	0.4
365	16	178	22	1.9	11	0.4
365	16	178	22	1.9	8.1	0.7
395	16	208	24	2.6	15	0.6
395	16	208	24	2.7	11	1.0
500	16	258	26	8	38	1.2
500	16	258	26	8	24	1.8
540	16	320	29	12	96	1.9
540	16	320	29	12	67	3.4
600	16	375	37	17	147	2.9
600	16	375	37	17	82	5.2
720	16	410	37	20	216	2.8
720	16	410	37	20	108	5.5

ANGULAR EXPANSION JOINTS WITH LOOSE FLANGES

Type WBN



Type WBK



Nominal diameter	Nominal angular movement absorption	Type WBN 25... WBK 25...	Order No. standard version		WBN		WBK	
			WBN	WBK	overall length	weight approx.	overall length	weight approx.
DN	2α _N	–	–	–	L _o	G	L _o	G
–	degree	–	–	–	mm	kg	mm	kg
50	22	.0050.220.0	441301	441204	133	11	133	15
50	30	.0050.300.0	441302	441205	163	11	163	16
65	23	.0065.230.0	441303	441206	143	13	143	18
65	30	.0065.300.0	441304	441207	173	14	173	19
80	22	.0080.220.0	441305	441208	144	15	144	22
80	28	.0080.280.0	441306	441209	174	16	174	23
100	22	.0100.220.0	441307	441210	154	20	154	28
100	27	.0100.270.0	441308	441211	184	21	184	29
125	22	.0125.220.0	441309	441212	185	26	185	35
125	29	.0125.290.0	441310	441213	235	27	235	36
150	20	.0150.200.0	441311	441214	185	43	185	61
150	27	.0150.270.0	441312	441215	235	45	235	63
200	14	.0200.140.0	441313	441216	205	52	205	78
200	22	.0200.220.0	441314	441217	276	59	276	84
250	14	.0250.140.0	441315	-	236	73	-	-
250	20	.0250.200.0	441316	441218	296	78	296	118
300	14	.0300.140.0	441317	-	256	121	-	-
300	19	.0300.190.0	441318	441219	346	131	346	204
350	11	.0350.110.0	441319	-	258	163	-	-
350	18	.0350.180.0	441320	441220	328	174	328	266

SINGLE HINGE VERSION TYPE WBN 25 ... GIMBAL HINGE VERSION TYPE WBK 25 ...

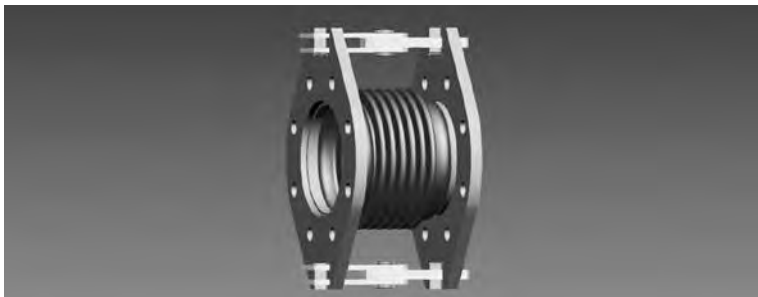
PN 25

06

Max. width approx.	Flange			Spring rate		
	drilling DIN 1092	rim diameter	thickness	c_r	c_c	c_p
B	PN	d_s	s	c_r	c_c	c_p
mm	-	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
275	40	92	20	0.5	4.2	0.1
275	40	92	20	0.5	2.6	0.1
295	40	107	22	0.7	5.3	0.1
295	40	107	22	0.7	3.3	0.2
310	40	122	24	0.9	8.3	0.2
310	40	122	24	0.9	5.9	0.2
340	40	147	24	1.4	11	0.3
340	40	147	24	1.4	7.5	0.4
365	40	178	26	1.9	19	0.4
365	40	178	26	1.9	12	0.7
460	40	208	28	4.8	26	0.6
460	40	208	28	4.8	16	1.0
500	25	258	32	8	84	1.2
500	25	258	32	8	57	2.1
570	25	320	37	12	147	2.0
570	25	320	37	12	92	3.2
670	25	375	43	23	188	3.0
670	25	375	43	23	104	5.4
750	25	410	47	27	343	3.2
750	25	410	47	27	196	5.6

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES TYPE WFN, WFK

06



Type designation

The type designation consists of 2 parts

1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example

Type WFN:

HYDRA single hinge angular expansion joint with plain fixed flanges

Type WFK:

HYDRA gimbal hinge angular expansion joint with plain fixed flanges

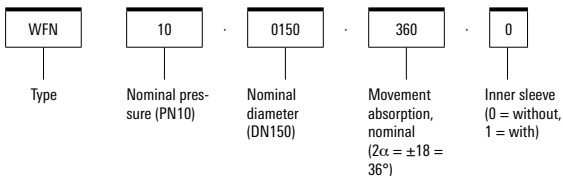
Standard version/materials:

Multi-ply bellows made of 1.4541

Flange made of P265GH (1.0425)

Operating temperature: up to 400 °C

Type designation (example)



Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions

- Type designation or order number

With material variation

- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

Type of pressure equipment according to Art. 1 & 2:

- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:

- Group 1 – dangerous
- Group 2 – all other fluids

State of medium

- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:

- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

Optional:

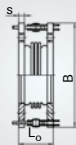
- Category _____

Note

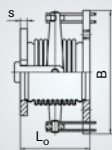
Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES

Type WFN



Type WFK



06

Nominal diameter	Nominal angular movement absorption	Type WFN 06... WFK 06...	Order No. standard version		WFN		WFK	
			WFN	WFK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_0	G	L_0	G
—	degree	—	—	—	mm	kg	mm	kg
50	33	.0050.330.0	442098	441321	140	7	140	11
50	41	.0050.410.0	442099	441322	160	7	160	11
65	27	.0065.270.0	442100	441323	130	8	130	13
65	39	.0065.390.0	442101	441324	160	9	160	13
80	27	.0080.270.0	442102	441325	140	11	140	16
80	38	.0080.380.0	442103	441326	170	12	170	17
100	27	.0100.270.0	442104	441327	140	12	140	17
100	38	.0100.380.0	442105	441328	170	13	170	18
125	30	.0125.300.0	442106	441329	160	15	160	21
125	39	.0125.390.0	442107	441330	190	16	190	22
150	23	.0150.230.0	442108	441331	170	17	170	23
150	36	.0150.360.0	442109	441332	220	17	220	24
200	23	.0200.230.0	442110	441333	180	22	180	32
200	34	.0200.340.0	442111	441334	240	24	240	35
250	18	.0250.180.0	442112	441335	180	28	180	40
250	32	.0250.320.0	442113	441336	260	31	260	42
300	19	.0300.190.0	442114	-	190	37	-	-
300	34	.0300.340.0	442115	441338	270	41	270	59

SINGLE HINGE VERSION TYPE WFN 06 ... GIMBAL HINGE VERSION TYPE WFK 06 ...

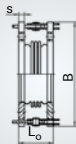
PN 6

06

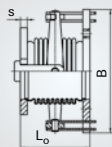
Max. width approx.	Flange		Spring rate		
	drilling DIN 1092	thickness	c_r	c_{α}	c_{β}
B	PN	s	c_r	c_{α}	c_{β}
mm	-	mm	Nm/bar	Nm/deg	Nm/deg bar
250	6	16	0.5	1.1	0.10
250	6	16	0.5	0.8	0.1
285	6	16	0.7	1.9	0.1
285	6	16	0.7	1.2	0.1
310	6	18	0.9	2.3	0.1
310	6	18	0.9	1.4	0.2
325	6	18	1.4	3.3	0.2
325	6	18	1.4	2.1	0.4
355	6	20	1.9	3	0.4
355	6	20	1.9	2.1	0.5
370	6	20	2.6	8.5	0.5
370	6	20	2.6	4.7	1.0
425	6	22	4	13	1.0
425	6	22	4	15	1.7
485	6	24	7	39	1.4
485	6	24	7	20	2.8
565	6	24	9	47	2.2
565	6	24	9	24	4.3

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES

Type WFN



Type WFK



06

Nominal diameter	Nominal angular movement absorption	Type WFN 06... WFK 06...	Order No. standard version		WFN		WFK	
			WFN	WFK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_0	G	L_0	G
—	degree	—	—	—	mm	kg	mm	kg
350	18	.0350.180.0	442116	-	200	60	-	-
350	34	.0350.340.0	442117	441340	310	68	310	100
400	13	.0400.130.0	442118	-	210	66	-	-
400	27	.0400.270.0	442119	441342	340	76	340	115
450	13	.0450.130.0	442120	-	210	74	-	-
450	24	.0450.240.0	442121	441343	330	83	330	133
500	14	.0500.140.0	442122	-	220	84	-	-
500	26	.0500.260.0	442123	441344	350	97	350	157
600	13	.0600.130.0	442124	-	250	152	-	-
600	25	.0600.250.0	442125	441345	390	172	390	287
700	14	.0700.140.0	442126	-	280	173	-	-
700	25	.0700.250.0	442127	441346	440	214	440	378
800	11	.0800.110.0	442128	-	290	235	-	-
800	23	.0800.230.0	442129	441347	490	279	490	494

SINGLE HINGE VERSION TYPE WFN 06 ...

GIMBAL HINGE VERSION TYPE WFK 06 ...

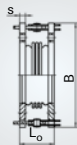
PN 6

06

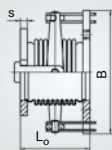
Max. width approx.	Flange		Spring rate		
	drilling DIN 1092	thickness	c_r	c_{α}	c_p
B	PN	s	c_r	c_{α}	c_p
mm	-	mm	Nm/bar	Nm/deg	Nm/deg bar
650	6	26	20	65	2.7
650	6	26	20	34	6.4
680	6	28	26	145	3.7
680	6	28	26	58	9.3
740	6	28	33	185	4.9
740	6	28	33	82	11.0
800	6	28	41	259	6.6
800	6	28	41	115	15.0
950	6	37	77	368	10.0
950	6	37	77	164	24.0
1060	6	37	104	420	18.0
1060	6	37	104	305	38.0
1180	6	43	135	998	22.0
1180	6	43	135	400	54.0

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES

Type WFN



Type WFK



06

Nominal diameter	Nominal angular movement absorption	Type WFN 10... WFK 10...	Order No. standard version		WFN		WFK	
			WFN	WFK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
50	31	.0050.310.0	442130	441348	140	10	140	14
50	37	.0050.370.0	442131	441349	160	10	160	14
65	26	.0065.260.0	442132	441350	130	11	130	16
65	37	.0065.370.0	442133	441351	170	12	170	17
80	25	.0080.250.0	442134	441352	140	12	140	17
80	36	.0080.360.0	442135	441353	180	13	180	18
100	26	.0100.260.0	442136	441354	150	15	150	20
100	36	.0100.360.0	442137	441355	190	16	190	22
125	25	.0125.250.0	442138	441356	170	18	170	24
125	34	.0125.340.0	442139	441357	210	18	210	24
150	23	.0150.230.0	442140	441358	180	23	180	32
150	36	.0150.360.0	442141	441359	240	24	240	33
200	22	.0200.220.0	442142	441360	190	28	190	39
200	32	.0200.320.0	442143	441361	240	31	240	41
250	18	.0250.180.0	442144	441362	190	46	190	69
250	30	.0250.300.0	442145	441363	270	51	270	75
300	23	.0300.230.0	442146	-	220	56	-	-
300	29	.0300.290.0	442147	441365	260	59	260	90

SINGLE HINGE VERSION TYPE WFN 10 ... GIMBAL HINGE VERSION TYPE WFK 10 ...

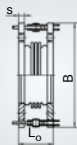
PN 10

06

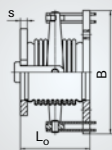
Max. width approx.	Flange		Spring rate		
	drilling DIN 1092	thickness	c_r	c_{α}	c_{β}
B	PN	s	c_r	c_{α}	c_{β}
mm	–	mm	Nm/bar	Nm/deg	Nm/deg bar
275	16	19	0.5	1.1	0.07
275	16	19	0.5	0.8	0.1
295	16	20	0.7	1.9	0.1
295	16	20	0.7	1.8	0.2
310	16	20	0.9	3.8	0.1
310	16	20	0.9	2.4	0.2
335	16	22	1.4	4.9	0.2
335	16	22	1.4	3.1	0.4
355	16	22	1.8	6	0.4
355	16	22	1.8	3.7	0.6
385	16	24	2.6	15	0.6
385	16	24	2.6	8.3	1.0
450	10	24	4	23	1.1
450	10	24	4	17	1.7
540	10	26	12	39	1.4
540	10	26	12	22	3.0
600	10	28	17	45	2.9
600	10	28	17	32	4.0

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES

Type WFN



Type WFK



06

Nominal diameter	Nominal angular movement absorption	Type WFN 10... WFK 10...	Order No. standard version		WFN		WFK	
			WFN	WFK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_0	G	L_0	G
—	degree	—	—	—	mm	kg	mm	kg
350	17	.0350.170.0	442148	-	200	67	-	-
350	26	.0350.260.0	442149	441366	270	72	270	112
400	12	.0400.120.0	442150	-	220	89	-	-
400	26	.0400.260.0	442151	441367	370	105	370	159
450	13	.0450.130.0	442152	-	240	112	-	-
450	25	.0450.250.0	442153	441368	360	127	360	200
500	14	.0500.140.0	442154	-	250	149	-	-
500	25	.0500.250.0	442155	441369	380	171	380	270
600	12	.0600.120.0	442156	-	270	188	-	-
600	23	.0600.230.0	442157	441370	410	214	410	373

SINGLE HINGE VERSION TYPE WFN 10 ... GIMBAL HINGE VERSION TYPE WFK 10 ...

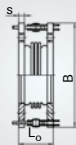
PN 10

06

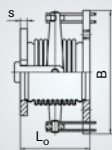
Max. width approx.	Flange		Spring rate		
	drilling DIN 1092	thickness	c_r	c_{α}	c_p
B	PN	s	c_r	c_{α}	c_p
mm	–	mm	Nm/bar	Nm/deg	Nm/deg bar
660	10	28	20	77	2.8
660	10	28	20	44	5.0
710	10	32	26	294	4.1
710	10	32	26	118	10.0
810	10	37	33	358	5.4
810	10	37	33	159	12.0
860	10	37	55	392	7.1
860	10	37	55	174	16.0
980	10	43	77	577	11.0
980	10	43	77	257	24.0

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES

Type WFN



Type WFK



Nominal diameter	Nominal angular movement absorption	Type WFN 16... WFK 16...	Order No. standard version		WFN		WFK	
			WFN	WFK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_0	G	L_0	G
—	degree	—	—	—	mm	kg	mm	kg
50	25	.0050.250.0	442158	441371	130	10	130	14
50	34	.0050.340.0	442159	441372	160	10	160	14
65	25	.0065.250.0	442160	441373	140	11	140	16
65	34	.0065.340.0	442161	441374	180	12	180	17
80	23	.0080.230.0	442162	441375	150	13	150	18
80	32	.0080.320.0	442163	441376	180	13	180	19
100	24	.0100.240.0	442164	441377	160	15	160	22
100	33	.0100.330.0	442165	441378	190	16	190	23
125	24	.0125.240.0	442166	441379	170	19	170	28
125	33	.0125.330.0	442167	441380	220	20	220	29
150	22	.0150.220.0	442168	441381	180	23	180	33
150	31	.0150.310.0	442169	441382	230	25	230	34
200	22	.0200.220.0	442170	441383	190	42	190	64
200	31	.0200.310.0	442171	441384	250	45	250	66
250	14	.0250.140.0	442172	441385	210	52	210	81
250	23	.0250.230.0	442173	441386	280	59	280	88
300	15	.0300.150.0	442174	-	230	74	-	-
300	22	.0300.220.0	442175	441387	320	81	320	121
350	12	.0350.120.0	442176	-	210	96	-	-
350	19	.0350.190.0	442177	441388	300	104	300	159

SINGLE HINGE VERSION TYPE WFN 16 ... GIMBAL HINGE VERSION TYPE WFK 16 ...

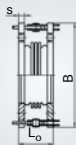
PN 16

06

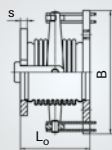
Max. width approx.	Flange		Spring rate		
	drilling DIN 1092	thickness	c_r	c_{α}	c_{β}
B	PN	s	c_r	c_{α}	c_{β}
mm	–	mm	Nm/bar	Nm/deg	Nm/deg bar
275	16	19	0.5	2.2	0.06
275	16	19	0.5	1.4	0.1
295	16	20	0.7	2.9	0.1
295	16	20	0.7	3.3	0.2
310	16	20	0.9	6.8	0.2
310	16	20	0.9	4.3	0.3
335	16	22	1.4	8.6	0.3
335	16	22	1.4	5.4	0.4
365	16	22	1.9	11	0.4
365	16	22	1.9	8	0.7
395	16	24	2.6	15	0.6
395	16	24	2.7	11	1.0
500	16	26	8	37	1.2
500	16	26	8	23	1.8
540	16	29	12	95	1.9
540	16	29	12	66	3.4
600	16	37	17	146	2.9
600	16	37	17	81	5.2
720	16	37	20	214	2.8
720	16	37	20	107	5.5

ANGULAR EXPANSION JOINTS WITH PLAIN FIXED FLANGES

Type WFN



Type WFK



06

Nominal diameter	Nominal angular movement absorption	Type WFN 25... WFK 25...	Order No. standard version		WFN		WFK	
			WFN	WFK	overall length	weight approx.	overall length	weight approx.
DN	2 α_N	—	—	—	L ₀	G	L ₀	G
—	degree	—	—	—	mm	kg	mm	kg
50	22	.0050.220.0	442178	441389	140	10	140	15
50	30	.0050.300.0	442179	441390	170	11	170	16
65	23	.0065.230.0	442180	441391	150	13	150	17
65	30	.0065.300.0	442181	441392	180	13	180	18
80	22	.0080.220.0	442182	441393	150	15	150	21
80	28	.0080.280.0	442183	441394	180	16	180	22
100	22	.0100.220.0	442184	441395	160	19	160	27
100	27	.0100.270.0	442185	441396	180	20	180	28
125	22	.0125.220.0	442186	441397	180	25	180	34
125	29	.0125.290.0	442187	441398	230	26	230	35
150	20	.0150.200.0	442188	441399	180	42	180	61
150	27	.0150.270.0	442189	441400	230	45	230	62
200	14	.0200.140.0	442190	441401	200	51	200	77
200	22	.0200.220.0	442191	441402	270	57	270	83
250	14	.0250.140.0	442192	-	230	72	-	-
250	20	.0250.200.0	442193	441403	290	76	290	116
300	14	.0300.140.0	442194	-	250	118	-	-
300	19	.0300.190.0	442195	441404	340	129	340	202
350	11	.0350.110.0	442196	-	250	159	-	-
350	18	.0350.180.0	442197	441405	320	170	320	262

SINGLE HINGE VERSION TYPE WFN 25 ...

GIMBAL HINGE VERSION TYPE WFK 25 ...

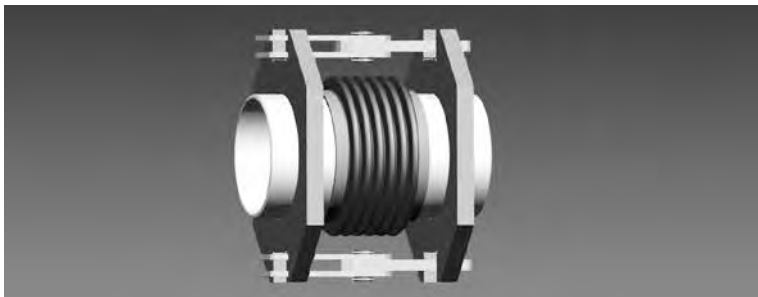
PN 25

06

Max. width approx.	Flange		Spring rate		
	drilling DIN 1092	thickness	c_r	c_{α}	c_{β}
B	PN	s	c_r	c_{α}	c_{β}
mm	–	mm	Nm/bar	Nm/deg	Nm/deg bar
275	40	20	0.5	4.0	0.07
275	40	20	0.5	2.5	0.1
295	40	22	0.7	5.2	0.1
295	40	22	0.7	3.3	0.2
310	40	24	0.9	8.1	0.2
310	40	24	0.9	5.8	0.2
340	40	24	1.4	10	0.3
340	40	24	1.4	7.4	0.4
365	40	26	1.9	18	0.4
365	40	26	1.9	12	0.7
460	40	28	4.8	26	0.6
460	40	28	4.8	16	1.0
500	25	32	8	83	1.2
500	25	32	8	56	2.1
570	25	37	12	145	2.0
570	25	37	12	91	3.2
670	25	43	23	186	3.0
670	25	43	23	103	5.4
750	25	47	27	339	3.2
750	25	47	27	193	5.6

ANGULAR EXPANSION JOINTS WITH WELD ENDS TYPE WRN, WRK

06



Type designation

The type designation consists of 2 parts

1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example

Type WRN: HYDRA single hinge angular expansion joint with weld ends

Type WRK: HYDRA gimbal hinge angular expansion joint with weld ends

Standard version/materials:

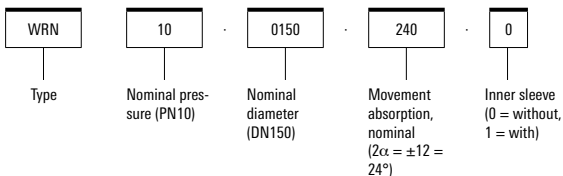
Multi-ply bellow made of 1.4541

Weld ends up to DN 300: P 235 GH (1.0345)

Weld ends from DN 350: P 265 GH (1.0425)

Operating temperature: up to 400 °C

Type designation (example)



Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions

- Type designation or order number

With material variation

- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

06

Type of pressure equipment according to Art. 1 & 2:

- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:

- Group 1 – dangerous
- Group 2 – all other fluids

State of medium

- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:

- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

Optional:

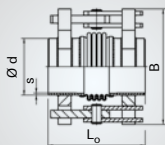
- Category _____

Note

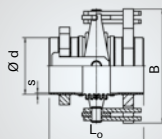
Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



Nominal diameter	Nominal angular movement absorption	Type WRN 02... WRK 02...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	2α _N	–	–	–	L ₀	G	L ₀	G
–	degree	–	–	–	mm	kg	mm	kg
400	10	.0400.100.0	441744	441436	290	32	290	47
400	20	.0400.200.0	441745	441437	350	35	350	50
400	28	.0400.280.0	441746	441438	410	37	410	52
450	10	.0450.099.0	441747	441439	290	37	290	55
450	19	.0450.190.0	441748	441440	355	41	355	58
450	26	.0450.260.0	441749	441441	420	43	420	61
500	11	.0500.110.0	441750	441442	320	44	320	67
500	20	.0500.200.0	441751	441443	385	48	385	71
500	30	.0500.300.0	441752	441444	475	53	475	76
600	10	.0600.100.0	441753	441445	345	64	345	99
600	22	.0600.220.0	441754	441446	450	70	450	105
600	29	.0600.290.0	441755	441447	550	76	550	111
700	9	.0700.091.0	441756	441448	395	92	395	158
700	17	.0700.170.0	441757	441449	475	99	475	164
700	25	.0700.250.0	441758	441450	615	110	615	175
800	8	.0800.084.0	441759	441451	440	126	440	219
800	18	.0800.180.0	441760	441452	555	136	555	228
800	26	.0800.260.0	441761	441453	670	156	670	249
900	7	.0900.074.0	441762	441454	445	146	445	266
900	14	.0900.140.0	441763	441455	530	155	530	275
900	20	.0900.200.0	441764	441456	680	169	680	289

SINGLE HINGE VERSION TYPE WRN 02 ... GIMBAL HINGE VERSION TYPE WRK 02 ...

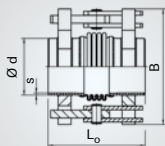
PN 2.5

06

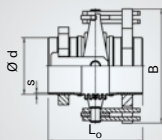
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c_α	c_β
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
595	406.4	6	14	142	2.6
595	406.4	6	14	71	5.3
595	406.4	6	14	47	7.9
655	457	6	18	165	3.5
655	457	6	18	82	7
655	457	6	18	55	11
715	508	6	23	179	4.5
715	508	6	23	89	9
715	508	6	23	54	15
815	610	6	32	254	7.3
815	610	6	32	109	17
815	610	6	32	69	27
970	711	6	78	326	11
970	711	6	78	162	21
970	711	6	78	89	39
1080	813	6	101	456	14
1080	813	6	101	196	33
1080	813	6	101	186	52
1200	914	6	128	628	19
1200	914	6	128	313	37
1200	914	6	128	170	68

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 02... WRK 02...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	2α _N	–	–	–	L _o	G	L _o	G
–	degree	–	–	–	mm	kg	mm	kg
1000	8	.1000.077.0	441765	441457	495	191	495	345
1000	14	.1000.140.0	441766	441458	590	200	590	355
1000	22	.1000.220.0	441767	441459	725	226	725	380
1200	7	.1200.065.0	441768	441460	535	284	535	567
1200	12	.1200.120.0	441769	441461	630	302	630	585
1200	18	.1200.180.0	441770	441462	755	326	755	609
1400	4	.1400.040.0	441771	-	565	396	-	-
1400	8	.1400.077.0	441772	441463	680	416	680	807
1400	12	.1400.120.0	441773	441464	850	469	850	860
1600	4	.1600.035.0	441774	-	565	523	-	-
1600	7	.1600.068.0	441775	441465	680	549	680	1161
1600	11	.1600.110.0	441776	441466	835	584	835	1195
1800	3	.1800.031.0	441777	-	565	575	-	-
1800	6	.1800.061.0	441778	-	680	603	-	-
1800	10	.1800.095.0	441779	441467	835	640	835	1430
2000	3	.2000.028.0	441780	-	615	773	-	-
2000	6	.2000.055.0	441781	-	730	803	-	-
2000	9	.2000.086.0	441782	441468	885	843	885	1846

SINGLE HINGE VERSION TYPE WRN 02 ... GIMBAL HINGE VERSION TYPE WRK 02 ...

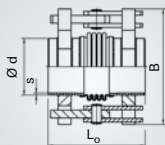
PN 2.5

06

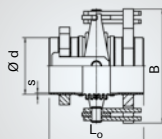
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c_α	c_β
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
1310	1016	6	157	814	24
1310	1016	6	157	408	49
1310	1016	6	158	367	84
1540	1220	8	296	1750	34
1540	1220	8	296	877	69
1540	1220	8	296	524	115
1740	1420	8	399	5560	56
1740	1420	8	399	2782	113
1740	1420	8	400	2516	195
1995	1620	8	646	8156	73
1995	1620	8	646	4078	146
1995	1620	8	646	2446	243
2185	1820	8	811	11440	92
2185	1820	8	811	5724	183
2185	1820	8	811	3433	305
2425	2020	8	996	15513	112
2425	2020	8	996	7752	225
2425	2020	8	996	4655	375

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 06... WRK 06...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	2α _N	–	–	–	L ₀	G	L ₀	G
–	degree	–	–	–	mm	kg	mm	kg
50	18	.0050.180.0	441798	441471	210	5	210	8
50	28	.0050.280.0	441799	441472	225	5	225	9
50	37	.0050.370.0	441800	441473	240	5	240	9
65	17	.0065.170.0	441801	441474	210	6	210	9
65	27	.0065.270.0	441802	441475	225	6	225	10
65	39	.0065.390.0	441803	441476	250	6	250	10
80	17	.0080.170.0	441804	441477	210	6	210	10
80	27	.0080.270.0	441805	441478	230	7	230	11
80	38	.0080.380.0	441806	441479	260	7	260	11
100	17	.0100.170.0	441807	441480	215	8	215	12
100	27	.0100.270.0	441808	441481	235	8	235	13
100	38	.0100.380.0	441809	441482	265	9	265	13
125	19	.0125.190.0	441810	441483	235	9	235	14
125	30	.0125.300.0	441811	441484	260	9	260	14
125	39	.0125.390.0	441812	441485	285	10	285	14
150	15	.0150.150.0	441813	441486	240	11	240	17
150	27	.0150.270.0	441814	441487	280	12	280	17
150	36	.0150.360.0	441815	441488	320	12	320	18
200	14	.0200.140.0	441816	441489	270	20	270	29
200	29	.0200.290.0	441817	441490	330	21	330	30
200	40	.0200.400.0	441818	441491	390	24	390	33
250	14	.0250.140.0	441819	441492	275	27	275	38
250	22	.0250.220.0	441820	441493	310	28	310	39
250	32	.0250.320.0	441821	441494	365	30	365	41

SINGLE HINGE VERSION TYPE WRN 06 ... GIMBAL HINGE VERSION TYPE WRK 06 ...

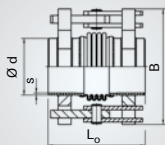
PN 6

06

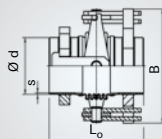
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c_α	c_β
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
195	60.3	4	0.5	2.2	0.04
195	60.3	4	0.5	1.3	0.06
195	60.3	4	0.5	1	0.08
215	76.1	4	0.7	3.2	0.05
215	76.1	4	0.7	1.9	0.09
215	76.1	4	0.7	1.2	0.1
230	88.9	4	0.9	3.9	0.08
230	88.9	4	0.9	2.3	0.1
230	88.9	4	0.9	1.5	0.2
265	114.3	4	1.4	5.5	0.1
265	114.3	4	1.4	3.3	0.2
265	114.3	4	1.4	2.1	0.4
285	139.7	4	1.9	5	0.2
285	139.7	4	1.9	3	0.4
285	139.7	4	1.9	2.1	0.5
325	168.3	4.5	2.6	14	0.3
325	168.3	4.5	2.6	7.2	0.6
325	168.3	4.5	2.6	4.7	1
385	219.1	6.3	4.3	22	0.6
385	219.1	6.3	4.3	9.5	1.4
385	219.1	6.3	4.4	12	2.2
445	273	7.1	6.7	52	1.1
445	273	7.1	6.7	31	1.8
445	273	7.1	6.7	20	2.8

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 06... WRK 06...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
300	15	.0300.150.0	441822	441495	285	38	285	53
300	23	.0300.230.0	441823	441496	325	40	325	54
300	34	.0300.340.0	441824	441497	385	43	385	57
350	13	.0350.130.0	441825	441498	330	46	330	71
350	25	.0350.250.0	441826	441499	390	49	390	75
350	34	.0350.340.0	441827	441500	460	55	460	80
400	10	.0400.100.0	441828	441501	350	60	350	94
400	19	.0400.190.0	441829	441502	415	65	415	99
400	27	.0400.270.0	441830	441503	500	71	500	105
450	10	.0450.098.0	441831	441504	355	68	355	111
450	18	.0450.180.0	441832	441505	420	74	420	117
450	24	.0450.240.0	441833	441506	490	79	490	122
500	10	.0500.100.0	441834	441507	385	88	385	144
500	17	.0500.170.0	441835	441508	435	93	435	150
500	26	.0500.260.0	441836	441509	530	103	530	160
600	10	.0600.100.0	441837	441510	435	136	435	243
600	16	.0600.160.0	441838	441511	490	144	490	250
600	25	.0600.250.0	441839	441512	600	160	600	266
700	9	.0700.091.0	441840	-	475	195	-	-
700	17	.0700.170.0	441841	441513	555	209	555	357
700	24	.0700.240.0	441842	441514	655	238	655	385
800	8	.0800.084.0	441843	-	490	233	-	-
800	16	.0800.160.0	441844	441515	590	255	590	449
800	23	.0800.230.0	441845	441516	720	284	720	479

SINGLE HINGE VERSION TYPE WRN 06 ... GIMBAL HINGE VERSION TYPE WRK 06 ...

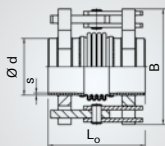
PN 6

06

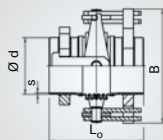
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c _r	c _α	c _β
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
495	323.9	8	9.3	63	1.6
495	323.9	8	9.3	38	2.7
495	323.9	8	9.3	24	4.3
580	355.6	6	20	87	2
580	355.6	6	20	43	4.1
580	355.6	6	20	35	6.4
640	406.4	6	26	194	2.8
640	406.4	6	26	97	5.6
640	406.4	6	26	58	9.3
700	457	6	33	248	3.7
700	457	6	33	124	7.3
700	457	6	33	83	11
750	508	6	41	347	4.9
750	508	6	41	208	8.2
750	508	6	41	116	15
900	610	6	77	493	7.9
900	610	6	77	296	13
900	610	6	77	164	24
1010	711	8	104	703	11
1010	711	8	104	352	21
1010	711	8	104	341	34
1120	813	8	135	1337	16
1120	813	8	135	668	32
1120	813	8	135	401	54

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 06... WRK 06...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
900	7	.0900.074.0	441846	-	580	379	-	-
900	14	.0900.140.0	441847	441517	680	408	680	714
900	20	.0900.200.0	441848	441518	810	445	810	751
1000	7	.1000.070.0	441849	-	640	434	-	-
1000	13	.1000.130.0	441850	441519	745	466	745	861
1000	19	.1000.190.0	441851	441520	885	507	885	902
1200	6	.1200.062.0	441852	-	640	579	-	-
1200	12	.1200.120.0	441853	441521	745	615	745	1184
1200	17	.1200.170.0	441854	441522	885	662	885	1231
1400	4	.1400.039.0	441855	-	620	741	-	-
1400	8	.1400.075.0	441856	-	740	778	-	-
1400	11	.1400.110.0	441857	441523	900	827	900	1747
1600	3	.1600.033.0	441858	-	720	1094	-	-
1600	6	.1600.063.0	441859	-	840	1138	-	-
1600	9	.1600.093.0	441860	441524	1000	1201	1000	2585
1800	3	.1800.029.0	441861	-	720	1211	-	-
1800	6	.1800.056.0	441862	-	840	1258	-	-
1800	9	.1800.085.0	441863	-	1000	1325	-	-
2000	3	.2000.027.0	441864	-	820	1877	-	-
2000	5	.2000.051.0	441865	-	940	1924	-	-
2000	8	.2000.078.0	441866	-	1100	2016	-	-

SINGLE HINGE VERSION TYPE WRN 06 ... GIMBAL HINGE VERSION TYPE WRK 06 ...

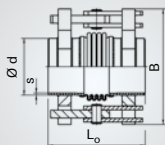
PN 6

06

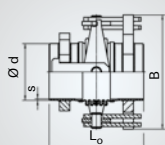
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c _r	c _α	c _β
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
1285	914	8	215	1896	21
1285	914	8	215	949	41
1285	914	8	215	569	69
1395	1016	8	264	2379	27
1395	1016	8	264	1189	54
1395	1016	8	264	713	90
1615	1220	10	370	3743	38
1615	1220	10	370	1872	75
1615	1220	10	370	1124	126
1840	1420	10	666	8394	58
1840	1420	10	666	4195	117
1840	1420	10	666	2516	195
2080	1620	10	1077	12301	76
2080	1620	10	1077	6150	151
2080	1620	10	1077	3691	252
2280	1820	10	1353	17255	95
2280	1820	10	1353	8628	190
2280	1820	10	1353	5178	316
2575	2020	10	2075	23378	116
2575	2020	10	2075	11694	233
2575	2020	10	2075	7018	388

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 10... WRK 10...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
50	17	.0050.170.0	441867	441525	210	5	210	8
50	27	.0050.270.0	441868	441526	225	5	225	9
50	37	.0050.370.0	441869	441527	250	6	250	9
65	16	.0065.160.0	441870	441528	210	6	210	9
65	29	.0065.290.0	441871	441529	235	6	235	10
65	37	.0065.370.0	441872	441530	260	7	260	10
80	16	.0080.160.0	441873	441531	215	7	215	10
80	25	.0080.250.0	441874	441532	235	7	235	11
80	36	.0080.360.0	441875	441533	265	7	265	11
100	17	.0100.170.0	441876	441534	215	8	215	12
100	26	.0100.260.0	441877	441535	240	8	240	13
100	36	.0100.360.0	441878	441536	275	9	275	13
125	16	.0125.160.0	441879	441537	260	11	260	16
125	25	.0125.250.0	441880	441538	285	12	285	17
125	32	.0125.320.0	441881	441539	315	12	315	17
150	15	.0150.150.0	441882	441540	260	14	260	21
150	27	.0150.270.0	441883	441541	305	15	305	22
150	36	.0150.360.0	441884	441542	350	17	350	23
200	14	.0200.140.0	441885	441543	270	24	270	33
200	26	.0200.260.0	441886	441544	320	25	320	34
200	35	.0200.350.0	441887	441545	370	28	370	37
250	14	.0250.140.0	441888	441546	295	41	295	59
250	21	.0250.210.0	441889	441547	330	43	330	61
250	30	.0250.300.0	441890	441548	390	47	390	66

SINGLE HINGE VERSION TYPE WRN 10 ... GIMBAL HINGE VERSION TYPE WRK 10 ...

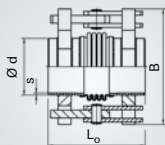
PN 10

06

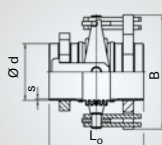
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c_{α}	c_{β}
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
195	60.3	4	0.5	2.2	0.04
195	60.3	4	0.5	1.3	0.06
195	60.3	4	0.5	0.8	0.1
215	76.1	4	0.7	3.2	0.05
215	76.1	4	0.7	1.6	0.1
215	76.1	4	0.7	1.8	0.2
230	88.9	4	0.9	6.3	0.09
230	88.9	4	0.9	3.8	0.1
230	88.9	4	0.9	2.4	0.2
265	114.3	4	1.4	8.2	0.1
265	114.3	4	1.4	4.9	0.2
265	114.3	4	1.4	3.1	0.4
285	139.7	4	1.8	10	0.2
285	139.7	4	1.8	6	0.4
285	139.7	4	1.8	4.3	0.5
325	168.3	4.5	2.6	25	0.3
325	168.3	4.5	2.6	13	0.7
325	168.3	4.5	2.6	8.4	1
385	219.1	6.3	4.4	39	0.6
385	219.1	6.3	4.4	20	1.3
385	219.1	6.3	4.4	15	2
480	273	7.1	12	52	1.1
480	273	7.1	12	31	1.8
480	273	7.1	12	22	3

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 10... WRK 10...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
300	15	.0300.150.0	441891	441549	330	58	330	86
300	23	.0300.230.0	441892	441550	370	61	370	89
300	29	.0300.290.0	441893	441551	410	63	410	91
350	13	.0350.130.0	441894	441552	350	53	350	86
350	21	.0350.210.0	441895	441553	395	56	395	89
350	26	.0350.260.0	441896	441554	435	59	435	92
400	9	.0400.094.0	441897	441555	355	71	355	116
400	18	.0400.180.0	441898	441556	430	79	430	124
400	26	.0400.260.0	441899	441557	520	90	520	135
450	10	.0450.097.0	441900	441558	420	112	420	166
450	16	.0450.160.0	441901	441559	470	118	470	173
450	23	.0450.230.0	441902	441560	545	128	545	182
500	10	.0500.100.0	441903	441561	470	150	470	243
500	16	.0500.160.0	441904	441562	525	158	525	251
500	24	.0500.240.0	441905	441563	605	171	605	264
600	9	.0600.094.0	441906	-	475	180	-	-
600	15	.0600.150.0	441907	441564	535	190	535	327
600	23	.0600.230.0	441908	441565	645	211	645	348
700	9	.0700.086.0	441909	-	525	292	-	-
700	16	.0700.160.0	441910	441568	620	320	685	694
700	22	.0700.220.0	441911	441567	715	348	715	580
800	8	.0800.084.0	441912	-	585	355	-	-
800	15	.0800.150.0	441913	441568	685	388	685	694
800	22	.0800.220.0	441914	441569	820	429	820	735

SINGLE HINGE VERSION TYPE WRN 10 ... GIMBAL HINGE VERSION TYPE WRK 10 ...

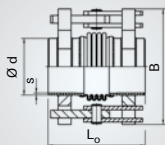
PN 10

06

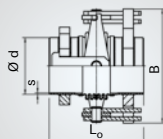
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c _r	c _α	c _β
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
540	323.9	8	17	76	1.7
540	323.9	8	17	45	2.9
540	323.9	8	17	32	4
580	355.6	6	20	104	2.1
580	355.6	6	20	62	3.6
580	355.6	6	20	45	5
640	406.4	6	26	397	3.1
640	406.4	6	26	198	6.1
640	406.4	6	26	119	10
740	457	8	33	482	4
740	457	8	33	289	6.7
740	457	8	33	181	11
790	508	8	55	526	5.4
790	508	8	55	316	8.9
790	508	8	55	197	14
900	610	8	77	775	8.2
900	610	8	77	465	14
900	610	8	77	259	24
1065	711	8	131	1381	12
1065	711	8	131	690	24
1065	711	8	131	461	36
1165	813	10	169	1794	17
1165	813	10	169	897	33
1165	813	10	169	538	56

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 10... WRK 10...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	–	–	–	L_0	G	L_0	G
–	degree	–	–	–	mm	kg	mm	kg
900	7	.0900.074.0	441915	-	635	469	-	-
900	14	.0900.140.0	441916	441570	735	505	735	905
900	20	.0900.200.0	441917	441571	870	552	870	952
1000	6	.1000.057.0	441918	-	745	689	-	-
1000	11	.1000.110.0	441919	441572	850	736	850	1338
1000	16	.1000.160.0	441920	441573	995	801	995	1403
1200	6	.1200.059.0	441921	-	750	885	-	-
1200	11	.1200.110.0	441922	-	860	942	-	-
1200	15	.1200.150.0	441923	441574	965	1000	965	1971
1400	4	.1400.037.0	441924	-	825	1413	-	-
1400	7	.1400.069.0	441925	-	950	1458	-	-
1400	10	.1400.099.0	441926	441575	1115	1551	1115	3168

SINGLE HINGE VERSION TYPE WRN 10 ... GIMBAL HINGE VERSION TYPE WRK 10 ...

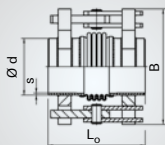
PN 10

06

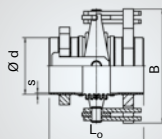
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c_{α}	c_p
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
1315	914	10	215	2542	21
1315	914	10	215	1272	43
1315	914	10	215	764	71
1450	1016	10	355	5007	28
1450	1016	10	355	2502	56
1450	1016	10	355	1502	93
1680	1220	10	617	5354	40
1680	1220	10	617	2677	80
1680	1220	10	617	1786	120
1975	1420	10	1041	11650	60
1975	1420	10	1041	5827	121
1975	1420	10	1041	3496	201

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 16... WRK 16...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	—	—	—	L_0	G	L_0	G
—	degree	—	—	—	mm	kg	mm	kg
50	16	.0050.160.0	441927	441576	210	5	210	8
50	25	.0050.250.0	441928	441577	225	6	225	9
50	34	.0050.340.0	441929	441578	250	6	250	9
65	16	.0065.160.0	441930	441579	210	6	210	9
65	25	.0065.250.0	441931	441580	230	6	230	10
65	34	.0065.340.0	441932	441581	265	7	265	11
80	14	.0080.140.0	441933	441582	235	9	235	13
80	23	.0080.230.0	441934	441583	260	9	260	13
80	32	.0080.320.0	441935	441584	295	10	295	13
100	15	.0100.150.0	441936	441585	240	10	240	15
100	24	.0100.240.0	441937	441586	265	11	265	15
100	33	.0100.330.0	441938	441587	305	12	305	16
125	15	.0125.150.0	441939	441588	260	12	260	18
125	24	.0125.240.0	441940	441589	285	12	285	18
125	33	.0125.330.0	441941	441590	335	14	335	19
150	14	.0150.140.0	441942	441591	260	17	260	25
150	22	.0150.220.0	441943	441592	290	17	290	26
150	31	.0150.310.0	441944	441593	345	19	345	28
200	14	.0200.140.0	441945	441594	315	39	315	55
200	22	.0200.220.0	441946	441595	350	41	350	57
200	31	.0200.310.0	441947	441596	405	44	405	60

SINGLE HINGE VERSION TYPE WRN 16 ... GIMBAL HINGE VERSION TYPE WRK 16 ...

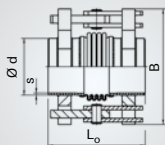
PN 16

06

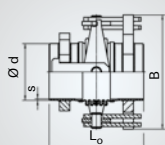
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c_{α}	c_{β}
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
195	60.3	4	0.5	3.7	0.04
195	60.3	4	0.5	2.2	0.06
195	60.3	4	0.5	1.4	0.1
215	76.1	4	0.7	4.9	0.06
215	76.1	4	0.7	2.9	0.1
215	76.1	4	0.7	3.3	0.2
230	88.9	4	0.9	12	0.09
230	88.9	4	0.9	6.9	0.2
230	88.9	4	0.9	4.3	0.3
265	114.3	4	1.4	15	0.2
265	114.3	4	1.4	8.8	0.3
265	114.3	4	1.4	5.5	0.4
285	139.7	4	1.9	18	0.2
285	139.7	4	1.9	11	0.4
285	139.7	4	1.9	8.1	0.7
325	168.3	4.5	2.6	25	0.3
325	168.3	4.5	2.6	15	0.6
325	168.3	4.5	2.7	11	1
420	219.1	6.3	7.9	63	0.7
420	219.1	6.3	7.9	38	1.2
420	219.1	6.3	7.9	24	1.8

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 16... WRK 16...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	–	–	–	L_o	G	L_o	G
–	degree	–	–	–	mm	kg	mm	kg
250	9	.0250.091.0	441948	441597	320	48	320	73
250	16	.0250.160.0	441949	441598	375	51	375	76
250	23	.0250.230.0	441950	441599	430	57	430	82
300	10	.0300.096.0	441951	441600	350	67	350	102
300	15	.0300.150.0	441952	441601	390	71	390	106
300	22	.0300.220.0	441953	441602	470	78	470	113
350	9	.0350.088.0	441954	441603	410	83	410	125
350	14	.0350.140.0	441955	441604	450	87	450	128
350	20	.0350.200.0	441956	441605	530	94	530	136
400	9	.0400.093.0	441957	-	425	119	-	-
400	15	.0400.150.0	441958	441606	475	128	475	202
400	23	.0400.230.0	441959	441607	575	145	575	220
450	9	.0450.090.0	441960	-	425	134	-	-
450	14	.0450.140.0	441961	441608	475	144	475	239
450	22	.0450.220.0	441962	441609	575	163	575	259
500	10	.0500.099.0	441963	-	475	173	-	-
500	16	.0500.160.0	441964	441610	530	184	530	303
500	22	.0500.220.0	441965	441611	610	200	610	319
600	6	.0600.063.0	441966	-	520	259	-	-
600	12	.0600.120.0	441967	441612	610	283	610	487
600	16	.0600.160.0	441968	441613	695	308	695	512

SINGLE HINGE VERSION TYPE WRN 16 ... GIMBAL HINGE VERSION TYPE WRK 16 ...

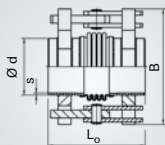
PN 16

06

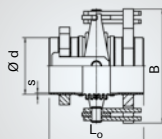
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness	c_r	c_{α}	c_{β}
B	d	s	c_r	c_{α}	c_{β}
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
480	273	7.1	12	160	1.1
480	273	7.1	12	80	2.2
480	273	7.1	12	67	3.4
540	323.9	8	17	246	1.7
540	323.9	8	17	147	2.9
540	323.9	8	17	82	5.2
620	355.6	8	20	288	2.1
620	355.6	8	20	173	3.4
620	355.6	8	20	96	6.2
680	406.4	8	35	517	3.3
680	406.4	8	35	310	5.6
680	406.4	8	35	172	10
740	457	8	44	654	4.2
740	457	8	44	392	7
740	457	8	44	218	13
790	508	8	55	715	5.6
790	508	8	55	429	9.3
790	508	8	55	268	15
945	610	8	97	2052	8.5
945	610	8	97	1026	17
945	610	8	97	684	25

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 16... WRK 16...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_N$	–	–	–	L_0	G	L_0	G
–	degree	–	–	–	mm	kg	mm	kg
700	6	.0700.063.0	441969	-	570	348	-	-
700	12	.0700.120.0	441970	-	665	377	-	-
700	16	.0700.160.0	441971	441614	755	406	755	694
800	6	.0800.060.0	441972	-	630	521	-	-
800	11	.0800.110.0	441973	-	725	557	-	-
800	15	.0800.150.0	441974	441615	820	595	820	1056
900	6	.0900.060.0	441975	-	735	792	-	-
900	11	.0900.110.0	441976	441616	835	841	835	1519
900	16	.0900.160.0	441977	441617	970	913	970	1591
1000	6	.1000.057.0	441978	-	755	880	-	-
1000	9	.1000.091.0	441979	-	830	925	-	-
1000	14	.1000.140.0	441980	441618	980	1015	980	1868

SINGLE HINGE VERSION TYPE WRN 16 ... GIMBAL HINGE VERSION TYPE WRK 16 ...

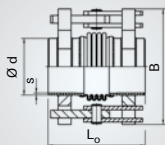
PN 16

06

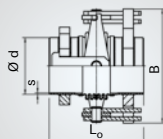
Max. width approx.	Weld end		Spring rate		
	outside diameter	wall thickness			
B	d	s	c_r	c₀	c_p
mm	mm	mm	Nm/bar	Nm/deg	Nm/deg bar
1085	711	10	131	2524	12
1085	711	10	131	1262	24
1085	711	10	131	841	35
1220	813	10	226	3410	16
1220	813	10	226	1705	32
1220	813	10	226	1136	47
1380	914	10	362	4707	21
1380	914	10	362	2352	43
1380	914	10	362	1411	72
1490	1016	10	445	6654	29
1490	1016	10	445	3994	49
1490	1016	10	445	2218	88

ANGULAR EXPANSION JOINTS WITH WELD ENDS

Type WRN



Type WRK



06

Nominal diameter	Nominal angular movement absorption	Type WRN 25... WRK 25...	Order No. standard version		WRN		WRK	
			WRN	WRK	overall length	weight approx.	overall length	weight approx.
DN	$2\alpha_n$	—	—	—	L_o	G	L_o	G
—	degree	—	—	—	mm	kg	mm	kg
50	14	.0050.140.0	441981	441619	210	6	210	9
50	22	.0050.220.0	441982	441620	230	7	230	10
50	30	.0050.300.0	441983	441621	260	7	260	10
65	15	.0065.150.0	441984	441622	235	7	235	11
65	23	.0065.230.0	441985	441623	255	8	255	12
65	29	.0065.290.0	441986	441624	275	8	275	12
80	14	.0080.140.0	441987	441625	235	9	235	13
80	22	.0080.220.0	441988	441626	260	9	260	13
80	28	.0080.280.0	441989	441627	285	10	285	13
100	14	.0100.140.0	441990	441628	240	12	240	18
100	22	.0100.220.0	441991	441629	265	13	265	18
100	27	.0100.270.0	441992	441630	290	13	290	19
125	14	.0125.140.0	441993	441631	265	14	265	22
125	22	.0125.220.0	441994	441632	295	15	295	23
125	27	.0125.270.0	441995	441633	325	16	325	23
150	13	.0150.130.0	441996	441634	305	29	305	43
150	20	.0150.200.0	441997	441635	335	31	335	44
150	27	.0150.270.0	441998	441636	385	33	385	47
200	9	.0200.091.0	441999	441637	335	44	335	63
200	16	.0200.160.0	442000	441638	390	47	390	67
200	22	.0200.220.0	442001	441639	440	52	440	71
250	9	.0250.090.0	442002	441640	340	55	340	84
250	14	.0250.140.0	442003	441641	380	58	380	87
250	20	.0250.200.0	442004	441642	440	63	440	92