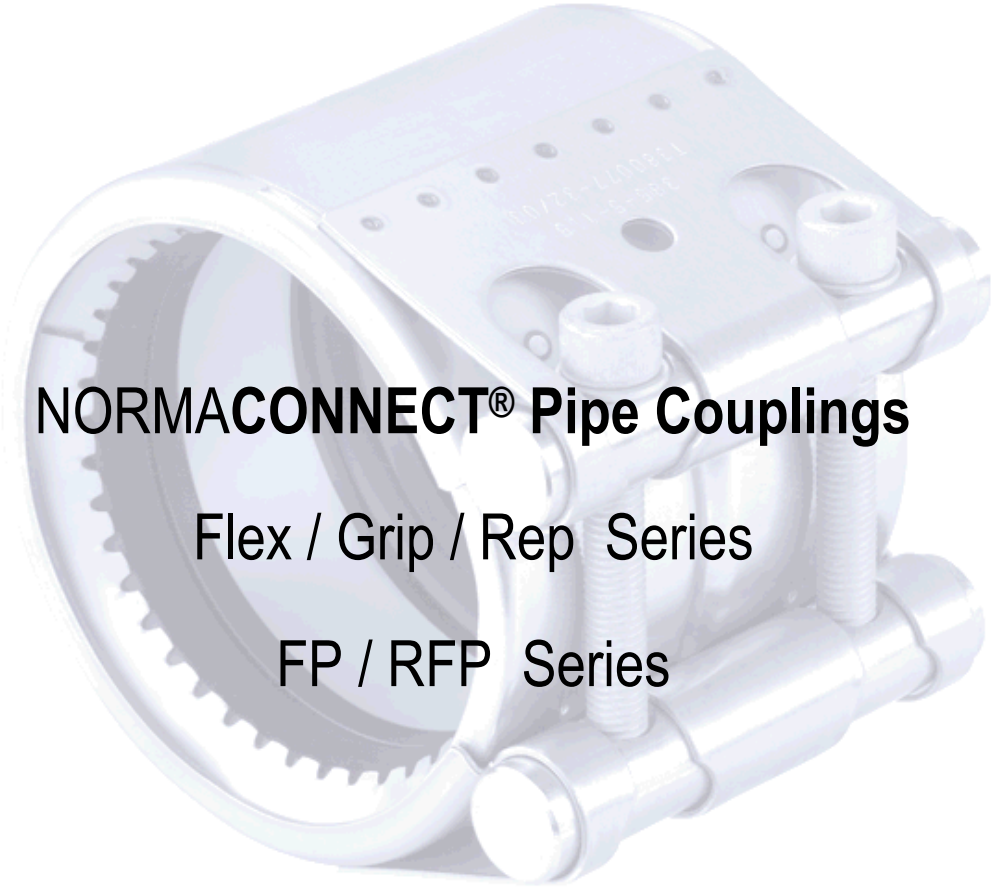
TECHNICAL MANUAL



NORMA**CONNECT®** Pipe Couplings

Flex / Grip / Rep Series

FP / RFP Series

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1. INTRODUCTION

1.1. Competence in joining technique

Established in 1949, we have developed during the run of the past decades to an enterprise of worldwide importance with the head office near Frankfurt/Main, Germany, and branch offices in England, France, Spain, USA and Australia, which brought us up to the leader position in the market section of joining technique, today.

Certified according to the requirements of DIN EN ISO 9001 and QS 9000 we have set up standards with regard to product quality. We distribute our fully developed, customer interpreted and ready-to-use products like connecting and retaining elements, such as clamps, quick connectors and connecting systems under the trade name NORMA®.

Our customers are spread over the whole sector of industry and can choose among a range of six product groups offering about 20.000 variants; this means that nearly every imaginable joining of product conveying pipe systems and their fastening can be realized safely and reliably by a NORMA® product. We manufacture up to 3,500,000 clamps a day.

Based on the profound experience in the entire range of joining technique our enterprise has changed constantly from a simple manufacturer and supplier to a worldwide accepted and skilled specialist and problem solver and by that means has become a partner in development for the industry and industrial application. Many of the NORMA® products are used in serial manufacture of the automotive industry and thus confirm the expertise of our development work and also the admittedly high quality of our goods.

Use our competence and experience in the field of joining technique and the resulting quality products for your own benefit.

1.2. Production Site: Gerbershausen / Thüringen (Germany)

Gerbershausen as additional production facility was chosen among other reasons because of the great potential of skilled workers living in this area.

Today the new 22.000 m^2 plant includes two modern production halls equipped with latest machinery for the production of pipe couplings. The investments done up to now reach an amount of approx. 10 million Euro.

This new, modern production site is designed to satisfy the growing demand for its products and thus provides a safe and successful future for the skilled and qualified workers. The quality of the here manufactured NORMA**CONNECT**® pipe couplings and repair clamps will guarantee for that.

2. PRODUCT BENEFITS

2.1. Benefits of NORMA**CONNECT**® Pipe Couplings

NORMA**CONNECT**® pipe couplings provide the following features:

Simple fitting and quick installation

- Ready to use, no single parts, no disassembling and reassembling
- No preparation time, no pipe-end treatment, no harmonization work
- Offers angular deflection, no precise pipe gap necessary, stress-free pipe joining

Reliable sealing system

- Dynamic sealing effect even with rough pipe surface
- Dampens pressure surges, vibration and shocks
- Axial-restraint (Grip / Grip E, CombiGrip / CombiGrip E, PlastGrip / PlastGrip E)
- Allows length variation (Flex)

Durable and economic

- High chemical resistance of stainless steel components and sealing sleeve
- Long-term elasticity of rubber
- Trouble-free and maintenance-free pipe joint
- Couplings are several times re-usable
- No pipe-end treatment, thus cost saving

Universal range of applications

- For pressure, depression or vacuum
- Free choice of pipe material
- Joins same or different pipe materials
- Dampens pressure surges or structure borne noise
- Repairs pipe damage

2.2. Benefits for the user

NORMA**CONNECT**® pipe couplings and repair clamps provide benefits for the user with regard

... to

- Industry and industrial applications
- Water supply and water treatment
- Domestic application
- Shipbuilding and ship repair
- Service, repair and maintenance

... to planning

- Simple and cost-reliable planning with ready-to-use pipe joints
- Reproducibility of fitting time, installation according to schedule
- Low weight, handy, compact (shipbuilding, vehicle construction)
- Reduced space requirement thus tight pipe guidance possible
- Enlargement or change of pipeline direction is done quickly and at low cost, due to the re-usability of the pipe couplings

... to installation

- Low weight, handy, compact
- Simple and quick installation due to ready-to-use pipe joints
- No preparation time, no pipe-end treatment, no harmonization work
- Tight-safe and long lasting pipe joint
- Installation of pre-fabricated pipe sections

... to operation

- Reliable through controlled manufacturing quality and high safety reserves
- Dampening of pressure surges, vibration and structure borne noise, protection of integrated gauges, fittings etc.
- Enlargement or change of pipe direction is done quick and at low cost, due to the re-usability of the pipe couplings
- Changes are possible during operation due to parallel guidance of pipes or bypasses

... to down-time, repair or maintenance

- Very quick reaction due to dischargeability and re-usability of pipe joints
- Very short down-time due to rapid disconnection and refitting of pipe coupling
- No design constraint, joins same or different pipe materials
- Ready-to-use, no preparation time, no pipe-end treatment, no harmonization work
- No risk of fire, e.g. during welding
- Problem solving during reorganization and reconstruction

3. THE NORMACONNECT® TYPE SERIES· OVERVIEW

The NORMA**CONNECT**® product range features the correct coupling for all conceivable application cases:

- NORMA**CONNECT® Flex**
  Axial non-restraint pipe coupling
  for use with metal and plastic pipes

- NORMA**CONNECT® Flex E**
  Economy version with hollow trunnions

- NORMA**CONNECT® Flex 3**
  Extra-wide version
- NORMA**CONNECT® Flex S**
  Special version for highest pressures
- NORMA**CONNECT® Grip**
  Axial restraint pipe coupling for use with metal pipes

- NORMA**CONNECT® Grip E**
  Economy version
- NORMA**CONNECT® CombiGrip / CombiGrip E**
  Axial restraint pipe coupling
  for joining a metal with a plastic pipe

- NORMA**CONNECT® PlastGrip / PlastGrip E**
  Axial restraint pipe coupling for use with plastic pipes
- NORMA**CONNECT® Rep E**
  Axial non-restraint repair coupling
  for use with metal and plastic pipes

- NORMA**CONNECT® Flex E-FP**
  Fire protected pipe coupling
- NORMA**CONNECT® Grip E-FP**
  Fire protected pipe coupling

- NORMA**CONNECT® RFP**
  retrofittable fire protector

The following tables give an overview of possible applications and relevant suitable couplings.

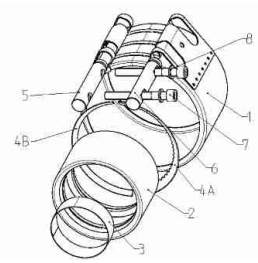
Flex Series

pipes to be joined	[mm]	Flex	Flex E	Flex 3	Rep E from 35 mm
metal + metal	26.9 to 168.3	70 to 32 bar	70 to 32 bar	-	60 to 32 bar
	180.0 to 1219.2	50 to 7 bar	30 to 4 bar	-	30 to 4 bar
	326.0 to 2032.0	-	-	16.5 to 1.5 bar	-
plastic + plastic	26.9 to 168.3	16 bar	16 bar	-	16 bar
	180.0 to 1219.2	16 to 7 bar	16 to 4 bar	-	16 to 4 bar
metal + plastic	26.9 to 168.3	16 bar	16 bar	-	-
	180.0 to 1219.2	16 to 7 bar	16 to 7 bar	-	-

Grip Series

pipes to be joined	[mm]	Grip	Grip E	Grip E-FP	CombiGrip E	CombiGrip	PlastGrip E	PlastGrip
metal + metal	26.9 to 168.3	70 to 32 bar	*70 to 32 bar*	70 to 32 bar	-		-	-
	180.0 to 419.0	-	*20 to 2 bar*	20 to 2 bar	-		-	-
	180.0 to 711.2	32 to 2.5 bar	-	-	-		-	-
plastic + plastic	40.0 to 168.3	-	-	-	-		16 bar	-
	200.0 to 406.4	-	-	-	-	-	-	16 to 6
metal + plastic	38/40 to 160/168.3	16 bar	*16 bar*	16 bar	16 bar	-	-	-
	200.0/204.0 to 406.0 /406.4	-	-	-		16 to 6	-	-

For pressure values concerning shipbuilding applications, please refer to the respective tables.



NORMA**CONNECT**® Components and Material Grades as per AISI/BS

W 2					
No.	**Component**	**Flex /IFex E**	**Grip / Grip E**	**CombiGrip / CombiGrip E**	**PlastGrip / PlastGrip E**
1	Housing with bridge	304/304 S31	304/304 S31	304/304 S31	304/304 S31
2	Sealing sleeve	EPDM / NBR / FPM	EPDM / NBR / FPM	EPDM / NBR	EPDM / NBR
3	Strip insert[1)]	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR
4A	Anchoring ring for metal pipes [2)]	-	301/301 S21	301/301 S21	-
4A	Anchoring ring for plastic pipes [2)]	-	-	PA-GF-MS[3)]	PA-GF-MS[3)]
4B	Protection ring	316Ti/320 S31	-	-	-
5+6	Solid locking trunnions	AISI 1213	AISI 1213	AISI 1213	AISI 1213
5+6	Hollow locking trunnions	AISI 1518	AISI 1518	AISI 1518	AISI 1518
7	Locking bolts	10.9	10.9	10.9	10.9
8	Washer	A4-80/316	A4-80/316	A4-80/316	A4-80/316

W 4					
No.	**Component**	**Flex /Flex E**	**Grip / Grip E**	**CombiGrip / CombiGrip E**	**PlastGrip / PlastGrip E**
1	Housing with bridge	304/304 S31	304/304 S31	304/304 S31	304/304 S31
2	Sealing sleeve	EPDM / NBR / FPM	EPDM / NBR / FPM	EPDM / NBR	EPDM / NBR
3	Strip insert[1)]	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR
4A	Anchoring ring for metal pipes [2)]	-	301/301 S21	301/301 S21	-
4A	Anchoring ring for plastic pipes [2)]	-	-	PA-GF-NS[)]	PA-GF-NS[3)]
4B	Protection ring	316Ti/320 S31	-	-	-
5+6	Solid locking trunnions	316L	316L	316L	316L
5+6	Hollow locking trunnions	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31
7	Locking bolts	A4-80/316	A4-80/316	A4-80/316	A4-80/316
8	Washer	A4-80/316	A4-80/316	A4-80/316	A4-80/316

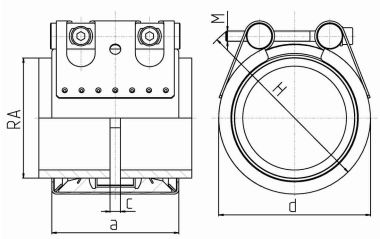
W 5						
No.	**Component**	**Flex /Flex E**	**Grip / Grip E**	**CombiGrip / CombiGrip E**	**PlastGrip / PlastGrip E**	**REP E**
1	Housing	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31
2	Sealing sleeve	EPDM / NBR / FPM	EPDM / NBR / FPM	EPDM / NBR	EPDM / NBR	EPDM / NBR
3	Strip insert[1)]	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31 / PA-GR	316Ti/320 S31
4A	Anchoring ring for metal pipes [2)]	-	301/301 S21	301/301 S21	-	-
4A	Anchoring ring for plastic pipes [2)]	-	-	PA-GF-NS[3)]	PA-GF-NS[3)]	-
4B	Protection ring	316Ti/320 S31	-	-	-	-
5+6	Solid locking trunnions	316L	316L	316L	316L	316L
5+6	Hollow locking trunnions	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31	316Ti/320 S31
7	Locking bolts	A4-80/316	A4-80/316	A4-80/316	A4-80/316	A4-80/316
8	Washer	A4-80/316	A4-80/316	A4-80/316	A4-80/316	A4-80/316

[1)] PA-GR plastic strip inserts only for shipbuilding pipe couplings
[2)] Combi Grip E has 2 different anchoring rings (1x for the metal end, 1x for the plastic end)
[3)] PA-GR : glass reinforced PA; NS: new silver

4. DATA SHEETS

4.1 Flex Series

4.1.1 NORMA**CONNECT® Flex** (26.9 – 168.3 mm)



Axial non-restraint pipe coupling for use with virtually all pipe materials

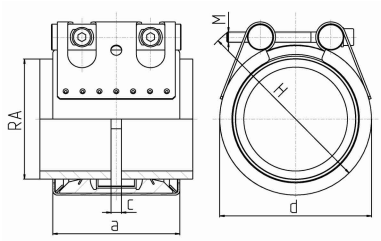
Available in **W2** or **W4** material
Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C, NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range	PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min} - OD_{max}				a	d	H			
						clamped				
(mm)	(mm)	(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
26,9	26,4 - 27,5	16	70	3	67	50	70	0,39	M 8 SW 6	5
28,0	27,5 - 28,5	16	70	3	67	50	70	0,39	M 8 SW 6	5
30,0	29,5 - 30,6	16	70	3	67	50	70	0,39	M 8 SW 6	5
33,7	33,0 - 34,3	16	60	3	67	55	75	0,40	M 8 SW 6	5
35,0	34,5 - 35,6	16	60	8	63	55	75	0,54	M 8 SW 6	5
38,0	37,5 - 38,6	16	60	8	63	60	80	0,54	M 8 SW 6	5
42,4	41,7 - 43,0	16	50	8	63	65	85	0,56	M 8 SW 6	5
44,5	44,0 - 45,1	16	50	8	63	65	85	0,56	M 8 SW 6	5
48,3	47,6 - 50,5	16	50	8	63	70	90	0,58	M 8 SW 6	5
54,0	53,3 - 54,6	16	50	17	78	75	95	0,76	M 8 SW 6	10
57,0	56,3 - 57,7	16	50	17	78	80	100	0,76	M 8 SW 6	10
60,3	59,5 - 61,0	16	40	17	78	85	105	0,77	M 8 SW 6	10
63,0	62,2 - 63,9	16	40	17	78	85	105	0,77	M 8 SW 6	10
70,0	69,0 - 71,0	16	40	25	98	90	110	1,37	M 8 SW 6	10
73,0	72,1 - 73,8	16	40	25	98	95	115	1,39	M 8 SW 6	10
76,1	75,2 - 77,0	16	35	25	98	100	120	1,39	M 8 SW 6	10
78,0	77,1 - 78,9	16	35	25	98	100	120	1,40	M 8 SW 6	10
80,0	79,0 - 80,8	16	35	25	98	100	120	1,43	M 8 SW 6	10
84,0	83,0 - 85,0	16	35	25	98	105	125	1,46	M 8 SW 6	10
88,9	87,0 - 89,9	16	35	25	98	110	130	1,47	M 8 SW 6	10
101,6	100,4 - 102,8	16	35	25	98	125	145	1,61	M 8 SW 6	10
104,0	102,8 - 106,1	16	35	25	98	125	145	1,62	M 8 SW 6	10
108,0	106,8 - 109,2	16	35	25	98	130	150	1,64	M 8 SW 6	10
110,0	108,8 - 111,4	16	35	25	98	130	150	1,69	M 8 SW 6	10
114,3	113,0 - 115,5	16	35	25	98	135	155	1,69	M 8 SW 6	15
122,0	120,8 - 123,2	16	32	35	113	145	165	2,40	M 10 SW 8	20
129,0	127,6 - 131,1	16	32	35	113	155	185	2,41	M 10 SW 8	20
133,0	131,5 - 134,4	16	32	35	113	160	190	2,43	M 10 SW 8	20
139,7	138,1 - 141,6	16	32	35	113	165	195	2,50	M 10 SW 8	25
141,3	139,6 - 142,8	16	32	35	113	170	200	2,50	M 10 SW 8	25
154,0	152,3 - 156,1	16	32	35	113	180	210	2,62	M 10 SW 8	30
159,0	157,3 - 160,7	16	32	35	113	185	215	2,69	M 10 SW 8	30
168,3	166,5 - 170,1	16	32	35	113	195	225	2,75	M 10 SW 8	30

References Subject to technical changes

1.) **PN** (Nominal Pressure) is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.1.2 NORMA**CONNECT**® **Flex** (180.0 – 1219.2 mm)



Axial non-restraint pipe coupling for use with virtually all pipe materials

Available in **W2, W4** or **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (MAWP or WP)
The **Diameter Difference** between the pipes to be joined must not exceed 5 mm.

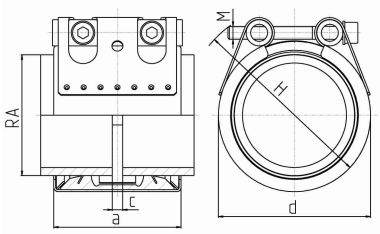
Coupling sizes >800 mm are in 2-part design ! Sizes > 1219,2 on request

OD	Clamp. Range			MAWP[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
180,0	178,0	-	182,0	23,5	50,0	35	141	210	240	5,4	M 12 SW 10	35
193,7	192,0	-	196,0	23,5	46,0	35	141	225	255	5,6	M 12 SW 10	35
206,0	202,0	-	208,0	20,0	43,0	35	141	240	270	5,8	M 12 SW 10	35
219,1	216,0	-	221,0	18,0	40,5	35	141	250	280	6,0	M 12 SW 10	35
225,0	222,0	-	227,0	18,0	40,0	35	141	255	285	6,1	M 12 SW 10	35
229,9	228,0	-	232,0	18,0	39,0	35	141	260	290	6,2	M 12 SW 10	35
244,5	242,0	-	247,0	18,0	37,0	35	141	275	305	6,4	M 12 SW 10	35
254,0	250,0	-	256,0	18,0	35,5	35	141	285	315	6,5	M 12 SW 10	35
267,0	264,0	-	269,0	18,0	33,5	35	141	300	330	6,7	M 12 SW 10	35
273,0	270,0	-	275,0	17,0	33,0	35	141	305	335	6,8	M 12 SW 10	35
306,0	302,0	-	308,0	15,0	29,0	35	141	340	370	7,4	M 12 SW 10	35
323,9	320,0	-	327,0	15,0	28,0	35	141	355	385	7,6	M 12 SW 10	35
326,0	322,0	-	329,0	13,0	27,5	35	141	360	390	7,7	M 12 SW 10	35
355,6	352,0	-	359,0	13,0	25,0	35	141	390	420	8,1	M 12 SW 10	35
406,4	402,0	-	410,0	10,0	22,0	35	141	440	470	8,9	M 12 SW 10	35
429,0	426,0	-	431,0	7,5	21,0	35	141	460	490	9,3	M 12 SW 10	40
442,0	439,0	-	444,0	7,5	20,0	35	141	475	505	9,5	M 12 SW 10	40
457,2	454,0	-	459,0	7,5	19,5	35	141	490	520	9,7	M 12 SW 10	40
508,0	505,0	-	510,0	7,5	17,0	35	141	540	570	10,5	M 12 SW 10	40
531,0	528,0	-	534,0	7,5	16,0	35	141	565	595	10,9	M 12 SW 10	50
558,8	556,0	-	562,0	7,5	15,5	35	141	590	620	11,3	M 12 SW 10	50
609,6	606,0	-	613,0	6,0	14,0	35	141	640	670	12,1	M 12 SW 10	50
634,0	631,0	-	637,0	5,0	13,5	35	141	665	695	12,5	M 12 SW 10	50
711,2	707,0	-	715,0	5,0	12,0	35	141	745	775	13,7	M 12 SW 10	50
762,0	758,0	-	766,0	4,5	11,0	35	141	795	885	14,5	M 12 SW 10	50
812,8	808,0	-	817,0	4,5	10,5	35	141	845	935	17,2	M 12 SW 10	50
914,4	909,0	-	919,0	3,3	9,5	35	141	945	1035	18,8	M 12 SW 10	60
1016,0	1013,0	-	1019,0	3,3	8,0	35	141	1050	1140	20,4	M 12 SW 10	60
1117,5	1114,0	-	1120,0	3,3	7,5	35	141	1150	1240	22,0	M 12 SW 10	60
1219,2	1216,0	-	1222,0	3,3	7,0	35	141	1250	1340	23,6	M 12 SW 10	60

References Subject to technical changes

1.) **MAWP** (maximum allowable working pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.1.3 NORMA**CONNECT**® **Flex E** (26.9 – 168.3 mm)



Axial non-restraint pipe coupling for use with virtually all pipe materials

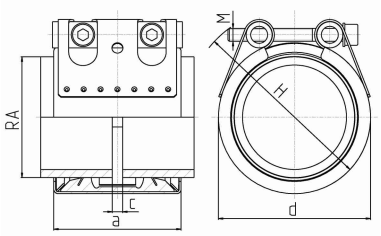
Available in **W2, W4** or **W5** material
Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C, NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range			PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(bar)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
26,9	26,4	-	27,5	16	70	3	67	50	70	0,31	M 8 SW 6	5
28,0	27,5	-	28,5	16	70	3	67	50	70	0,31	M 8 SW 6	5
30,0	29,5	-	30,6	16	70	3	67	50	70	0,31	M 8 SW 6	5
33,7	33,0	-	34,3	16	60	3	67	55	75	0,32	M 8 SW 6	5
35,0	34,5	-	35,6	16	60	8	63	55	75	0,43	M 8 SW 6	5
38,0	37,5	-	38,6	16	60	8	63	60	80	0,43	M 8 SW 6	5
42,4	41,7	-	43,0	16	50	8	63	65	85	0,44	M 8 SW 6	5
44,5	44,0	-	45,1	16	50	8	63	65	85	0,45	M 8 SW 6	5
48,3	47,6	-	50,5	16	50	8	63	70	90	0,46	M 8 SW 6	5
54,0	53,3	-	54,6	16	50	17	78	75	95	0,60	M 8 SW 6	10
57,0	56,3	-	57,7	16	50	17	78	80	100	0,61	M 8 SW 6	10
60,3	59,5	-	61,0	16	40	17	78	85	105	0,62	M 8 SW 6	10
63,0	62,2	-	63,9	16	40	17	78	85	105	0,62	M 8 SW 6	10
70,0	69,0	-	71,0	16	40	25	98	90	110	1,16	M 8 SW 6	10
73,0	72,1	-	73,8	16	40	25	98	95	115	1,18	M 8 SW 6	10
76,1	75,2	-	77,0	16	35	25	98	100	120	1,18	M 8 SW 6	10
78,0	77,1	-	78,9	16	35	25	98	100	120	1,19	M 8 SW 6	10
80,0	79,0	-	80,8	16	35	25	98	100	120	1,21	M 8 SW 6	10
84,0	83,0	-	85,0	16	35	25	98	105	125	1,24	M 8 SW 6	10
88,9	87,0	-	89,9	16	35	25	98	110	130	1,26	M 8 SW 6	10
101,6	100,4	-	102,8	16	35	25	98	125	145	1,39	M 8 SW 6	10
104,0	102,8	-	106,1	16	35	25	98	125	145	1,40	M 8 SW 6	10
108,0	106,8	-	109,2	16	35	25	98	130	150	1,42	M 8 SW 6	10
110,0	108,8	-	111,4	16	35	25	98	130	150	1,47	M 8 SW 6	10
114,3	113,0	-	115,5	16	35	25	98	135	155	1,47	M 8 SW 6	15
122,0	120,8	-	123,2	16	32	35	113	145	165	2,09	M 10 SW 8	20
129,0	127,6	-	131,1	16	32	35	113	155	185	2,10	M 10 SW 8	20
133,0	131,5	-	134,4	16	32	35	113	160	190	2,13	M 10 SW 8	20
139,7	138,1	-	141,6	16	32	35	113	165	195	2,19	M 10 SW 8	25
141,3	139,6	-	142,8	16	32	35	113	170	200	2,19	M 10 SW 8	25
154,0	152,3	-	156,1	16	32	35	113	180	210	2,31	M 10 SW 8	30
159,0	157,3	-	160,7	16	32	35	113	185	215	2,38	M 10 SW 8	30
168,3	166,5	-	170,1	16	32	35	113	195	225	2,43	M 10 SW 8	30

References Subject to technical changes

1.) **PN** (Nominal Pressure) is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.1.4 NORMA**CONNECT**® **Flex E** (180.0 – 1219.2 mm)



Axial non-restraint pipe coupling for use with virtually all pipe materials

Available in **W2, W4** or **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 working pressure (MAWP or WP)
The **Diameter Difference** between the pipes to be joined must not exceed 5 mm.

Coupling sizes > 800 mm are in 2-part design ! Sizes > 1219,2 on request

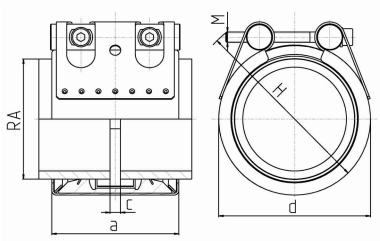
OD	Clamp. Range			MAWP[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
180,0	178,0	-	182,0	13,5	30,0	35	139	210	240	4,0	M 12 SW 10	25
193,7	192,0	-	196,0	13,5	28,0	35	139	225	255	4,1	M 12 SW 10	25
206,0	202,0	-	208,0	13,5	26,5	35	139	240	270	4,3	M 12 SW 10	25
219,1	216,0	-	221,0	13,5	23,0	35	139	250	280	4,4	M 12 SW 10	25
225,0	222,0	-	227,0	12,0	23,0	35	139	255	285	4,5	M 12 SW 10	25
229,9	228,0	-	232,0	12,0	23,0	35	139	260	290	4,5	M 12 SW 10	25
244,5	242,0	-	247,0	12,0	22,0	35	139	275	305	4,7	M 12 SW 10	25
254,0	250,0	-	256,0	12,0	21,0	35	139	285	315	4,8	M 12 SW 10	25
267,0	264,0	-	269,0	12,0	20,0	35	139	300	330	5,0	M 12 SW 10	25
273,0	270,0	-	275,0	12,0	20,0	35	139	305	335	5,1	M 12 SW 10	25
306,0	302,0	-	308,0	9,0	17,5	35	139	340	370	5,5	M 12 SW 10	25
323,9	320,0	-	327,0	9,0	17,5	35	139	355	385	5,7	M 12 SW 10	25
326,0	322,0	-	329,0	9,0	16,5	35	139	360	390	5,7	M 12 SW 10	25
355,6	352,0	-	359,0	9,0	15,0	35	139	390	420	6,0	M 12 SW 10	25
406,4	402,0	-	410,0	7,5	14,0	35	139	440	470	6,7	M 12 SW 10	25
429,0	426,0	-	431,0	5,5	13,0	35	139	460	490	6,9	M 12 SW 10	40,0
442,0	439,0	-	444,0	5,5	13,0	35	139	475	505	7,1	M 12 SW 10	40,0
457,2	454,0	-	459,0	5,5	12,0	35	139	490	520	7,3	M 12 SW 10	40,0
508,0	505,0	-	510,0	5,5	11,0	35	139	540	570	7,9	M 12 SW 10	40,0
531,0	528,0	-	534,0	5,5	10,5	35	139	565	595	8,1	M 12 SW 10	40,0
558,8	556,0	-	562,0	5,5	10,0	35	139	590	620	8,5	M 12 SW 10	40,0
609,6	606,0	-	613,0	4,5	9,0	35	139	640	670	9,1	M 12 SW 10	40,0
634,0	631,0	-	637,0	4,5	8,0	35	139	665	695	9,4	M 12 SW 10	40,0
711,2	707,0	-	715,0	4,0	7,0	35	139	745	775	10,3	M 12 SW 10	40,0
762,0	758,0	-	766,0	3,2	7,0	35	139	795	825	10,9	M 12 SW 10	40,0
812,8	808,0	-	817,0	3,2	6,5	35	139	845	935	12,8	M 12 SW 10	40,0
914,4	909,0	-	919,0	2,0	5,5	35	139	945	1035	14,0	M 12 SW 10	45,0
1016,0	1013,0	-	1019,0	2,0	5,0	35	139	1050	1140	15,2	M 12 SW 10	45,0
1117,5	1114,0	-	1120,0	2,0	4,5	35	139	1150	1240	16,4	M 12 SW 10	50,0
1219,2	1216,0	-	1222,0	2,0	4,0	35	139	1250	1340	17,7	M 12 SW 10	50,0

References Subject to technical changes

1.) **MAWP** (maximum allowable working pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.1.5 NORMA**CONNECT**® **Flex S** (193.7 – 1219.2 mm)

Axial non-restraint pipe coupling for use with virtually all pipe materials



Available in **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (WP)
The **Diameter Difference** between the pipes to be joined must not exceed 5 mm.

Coupling sizes > 800 mm are in 2-part design ! Sizes > 1219,2 on request

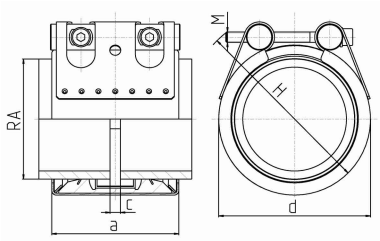
OD	Clamp. Range			WP[1)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}			a	d	H			
							clamped				
(mm)	(mm)			(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
193,7	192,0	-	196,0	53	35	142	225	255	6,1	M 12 SW 10	40
206,0	202,0	-	208,0	50	35	142	240	270	6,3	M 12 SW 10	40
219,1	216,0	-	221,0	47	35	142	250	280	6,6	M 12 SW 10	40
225,0	222,0	-	227,0	46	35	142	255	285	6,7	M 12 SW 10	40
229,9	228,0	-	232,0	45	35	142	260	290	6,8	M 12 SW 10	40
244,5	242,0	-	247,0	42	35	142	275	305	7,0	M 12 SW 10	40
254,0	250,0	-	256,0	40,5	35	142	285	315	7,2	M 12 SW 10	40
267,0	264,0	-	269,0	38,5	35	142	300	330	7,4	M 12 SW 10	40
273,0	270,0	-	275,0	38	35	142	305	335	7,5	M 12 SW 10	40
306,0	302,0	-	308,0	33,5	35	142	340	370	8,1	M 12 SW 10	40
323,9	320,0	-	327,0	32	35	142	355	385	8,4	M 12 SW 10	40
326,0	322,0	-	329,0	31,5	35	142	360	390	8,4	M 12 SW 10	40
355,6	352,0	-	359,0	29	35	142	390	420	9,0	M 12 SW 10	40
406,4	402,0	-	410,0	25	35	142	440	470	9,9	M 12 SW 10	40
429,0	426,0	-	431,0	24	35	142	460	490	10,3	M 12 SW 10	45
442,0	439,0	-	444,0	23	35	142	475	505	10,5	M 12 SW 10	45
457,2	454,0	-	459,0	22,5	35	142	490	520	10,7	M 12 SW 10	45
508,0	505,0	-	510,0	20	35	142	540	570	11,6	M 12 SW 10	45
531,0	528,0	-	534,0	19,5	35	142	565	595	12,0	M 12 SW 10	55
558,8	556,0	-	562,0	18,5	35	142	590	620	12,5	M 12 SW 10	55
609,6	606,0	-	613,0	16	35	142	640	670	13,4	M 12 SW 10	50
634,0	631,0	-	637,0	15,5	35	142	665	695	13,9	M 12 SW 10	50
711,2	707,0	-	715,0	14	35	142	745	775	15,2	M 12 SW 10	50
762,0	758,0	-	766,0	13	35	142	795	825	16,1	M 12 SW 10	55
812,8	808,0	-	817,0	12	35	142	845	875	19,0	M 12 SW 10	55
914,4	909,0	-	919,0	10	35	142	945	975	20,8	M 12 SW 10	65
1016,0	1013,0	-	1019,0	9,5	35	142	1050	1080	22,6	M 12 SW 10	65
1117,5	1114,0	-	1120,0	9	35	142	1150	1180	24,3	M 12 SW 10	65
1219,2	1216,0	-	1222,0	8	35	142	1250	1280	26,1	M 12 SW 10	65

References Subject to technical changes

1.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.1.6 NORMA**CONNECT® Flex 3** (326.0 – 2032.0 mm)

Axial non-restraint pipe coupling for use with virtually all pipe materials



Available in **W5** material

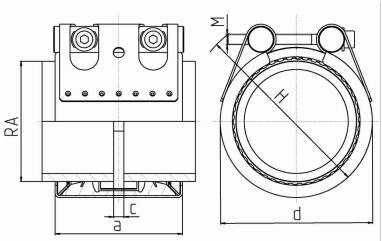
Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (WP)
The **Diameter Difference** between the pipes to be joined must not exceed 5 mm.

Coupling sizes > 800 mm are in 2-part design!

OD	Clamp. Range			WP[1)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}			a	d	H			
							clamped				
(mm)	(mm)			(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
326,0	322,0	-	329,0	16,5	65	211	365	405	11,9	M 16 SW 14	30
355,6	352,0	-	359,0	15,5	65	211	395	435	12,4	M 16 SW 14	35
406,4	402,0	-	410,0	13,5	65	211	445	485	13,4	M 16 SW 14	35
429,0	426,0	-	431,0	12,5	65	211	465	505	13,9	M 16 SW 14	35
442,0	439,0	-	444,0	12,0	65	211	480	520	14,1	M 16 SW 14	35
457,2	454,0	-	459,0	12,0	65	211	495	535	14,4	M 16 SW 14	35
508,0	505,0	-	510,0	10,5	65	211	545	585	15,4	M 16 SW 14	35
531,0	528,0	-	534,0	10,0	65	211	570	610	15,9	M 16 SW 14	35
558,8	556,0	-	562,0	9,5	65	211	595	635	16,4	M 16 SW 14	35
609,6	606,0	-	613,0	9,0	65	211	645	685	17,4	M 16 SW 14	40
634,0	631,0	-	637,0	8,5	65	211	670	710	17,9	M 16 SW 14	40
711,2	707,0	-	715,0	7,5	65	211	750	790	19,4	M 16 SW 14	40
762,0	758,0	-	766,0	7,0	65	211	800	840	20,4	M 16 SW 14	40
812,8	808,0	-	817,0	6,5	65	211	850	890	21,4	M 16 SW 14	45
914,4	909,0	-	919,0	6,0	65	211	950	990	23,4	M 16 SW 14	45
1016,0	1013,0	-	1019,0	5,0	65	211	1055	1095	25,4	M 16 SW 14	50
1117,5	1114,0	-	1120,0	4,5	65	211	1155	1195	27,4	M 16 SW 14	50
1219,2	1216,0	-	1222,0	4,0	65	211	1255	1295	29,4	M 16 SW 14	55
1320,8	1314,0	-	1328,0	3,0	65	211	1360	1400	31,4	M 16 SW 14	55
1422,4	1415,0	-	1430,0	3,0	65	211	1460	1500	33,4	M 16 SW 14	60
1524,0	1516,0	-	1532,0	2,5	65	211	1560	1600	35,4	M 16 SW 14	60
1625,6	1617,0	-	1634,0	2,5	65	211	1665	1705	37,4	M 16 SW 14	70
1727,2	1718,0	-	1736,0	2,0	65	211	1765	1805	39,4	M 16 SW 14	70
1828,8	1819,0	-	1838,0	2,0	65	211	1865	1905	41,4	M 16 SW 14	80
1930,4	1920,0	-	1940,0	2,0	65	211	1970	2010	43,4	M 16 SW 14	80
2032,0	2021,0	-	2042,0	1,5	65	211	2070	2110	45,4	M 16 SW 14	80

References Subject to technical changes

1.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.



4.2 Grip Series

4.2.1 NORMA**CONNECT®** **Grip** (26.9 – 168.3 mm)

Axial restraint pipe coupling for use with metal pipes
Available in **W2, W4** or **W5** material
Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C, NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range			PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
26,9	26,4	-	27,5	16	70	3	67	50	70	0,39	M 8 SW 6	10
28,0	27,5	-	28,5	16	70	3	67	50	70	0,39	M 8 SW 6	10
30,0	29,5	-	30,6	16	70	3	67	50	70	0,39	M 8 SW 6	10
33,7	33,0	-	34,3	16	60	3	67	55	75	0,40	M 8 SW 6	10
35,0	34,5	-	35,6	16	60	8	63	55	75	0,55	M 8 SW 6	15
38,0	37,5	-	38,6	16	60	8	63	60	80	0,55	M 8 SW 6	15
42,4	41,7	-	43,0	16	50	8	63	65	85	0,56	M 8 SW 6	15
44,5	44,0	-	45,1	16	50	8	63	65	85	0,57	M 8 SW 6	15
48,3	47,6	-	50,5	16	50	8	63	70	90	0,59	M 8 SW 6	15
54,0	53,3	-	54,6	16	50	17	78	75	95	0,77	M 8 SW 6	15
57,0	56,3	-	57,7	16	50	17	78	80	100	0,77	M 8 SW 6	20
60,3	59,5	-	61,0	16	40	17	78	85	105	0,78	M 8 SW 6	20
63,0	62,2	-	63,9	16	40	17	78	85	105	0,78	M 8 SW 6	20
70,0	69,0	-	71,0	16	40	25	98	90	110	1,38	M 10 SW 8	30
73,0	72,1	-	73,8	16	40	25	98	95	115	1,40	M 10 SW 8	30
76,1	75,2	-	77,0	16	35	25	98	100	120	1,40	M 10 SW 8	30
78,0	77,1	-	78,9	16	35	25	98	100	120	1,41	M 10 SW 8	30
80,0	79,0	-	80,8	16	35	25	98	100	120	1,44	M 10 SW 8	30
84,0	83,0	-	85,0	16	35	25	98	105	125	1,46	M 10 SW 8	30
88,9	87,0	-	89,9	16	35	25	98	110	130	1,48	M 10 SW 8	30
101,6	100,4	-	102,8	16	35	25	98	125	145	1,62	M 10 SW 8	30
104,0	102,8	-	106,1	16	35	25	98	125	145	1,63	M 10 SW 8	30
108,0	106,8	-	109,2	16	35	25	98	130	150	1,66	M 10 SW 8	30
110,0	108,8	-	111,4	16	35	25	98	130	150	1,71	M 10 SW 8	30
114,3	113,0	-	115,5	16	35	25	98	135	155	1,71	M 10 SW 8	40
122,0	120,8	-	123,2	16	32	35	115	145	165	2,42	M 12 SW 10	50
129,0	127,6	-	131,1	16	32	35	115	155	185	3,06	M 12 SW 10	50
133,0	131,5	-	134,4	16	32	35	115	160	190	3,16	M 12 SW 10	50
139,7	138,1	-	141,6	16	32	35	115	165	195	3,27	M 12 SW 10	50
141,3	139,6	-	142,8	16	32	35	115	170	200	3,27	M 12 SW 10	50
154,0	152,3	-	156,1	16	32	35	115	180	210	3,39	M 12 SW 10	60
159,0	157,3	-	160,7	16	32	35	115	185	215	3,51	M 12 SW 10	60
168,3	166,5	-	170,1	16	32	35	115	195	225	3,57	M 12 SW 10	60

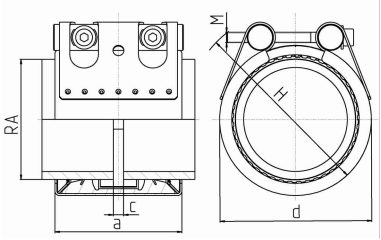
References Subject to technical changes

1.) **PN** (Nominal Pressure) is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.2.2 NORMA**CONNECT® Grip** (193.7 – 711.2 mm)

Axial restraint pipe coupling for use with metal pipes

Available in **W2, W4** or **W5** material

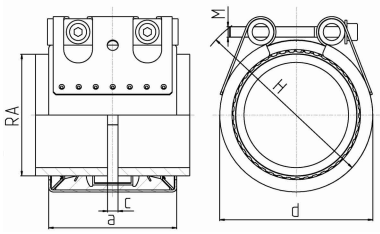


Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (MAWP or WP)

OD	Clamp. Range			MAWP[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
193,7	192,0	-	196,0	16,0	32,0	35	142	225	255	6,8	M 16 SW 14	150
206,0	202,0	-	208,0	16,0	32,0	35	142	240	270	7,0	M 16 SW 14	150
219,1	216,0	-	221,0	16,0	32,0	35	142	250	280	7,3	M 16 SW 14	150
225,0	222,0	-	227,0	13,0	26,5	35	142	255	285	7,4	M 16 SW 14	180
229,9	228,0	-	232,0	13,0	26,0	35	142	260	290	7,5	M 16 SW 14	180
244,5	242,0	-	247,0	12,0	24,5	35	142	275	305	7,7	M 16 SW 14	180
254,0	250,0	-	256,0	11,5	22,5	35	142	285	315	7,9	M 16 SW 14	180
267,0	264,0	-	269,0	11,0	22,5	35	142	300	330	8,2	M 16 SW 14	180
273,0	270,0	-	275,0	11,0	22,0	35	142	305	335	8,3	M 16 SW 14	180
306,0	302,0	-	308,0	9,5	19,5	35	142	340	370	8,9	M 16 SW 14	180
323,9	320,0	-	327,0	6,5	13,0	35	142	355	385	9,2	M 16 SW 14	180
326,0	322,0	-	329,0	6,5	13,0	35	142	360	390	9,3	M 16 SW 14	180
355,6	352,0	-	359,0	6,0	12,0	35	142	390	420	9,8	M 16 SW 14	180
406,4	402,0	-	410,0	4,5	9,0	35	142	440	470	10,8	M 16 SW 14	180
429,0	426,0	-	431,0	4,0	8,5	35	142	460	490	11,3	M 16 SW 14	180
442,0	439,0	-	444,0	4,0	8,0	35	142	475	505	11,5	M 16 SW 14	180
457,2	454,0	-	459,0	4,0	8,0	35	142	490	520	11,8	M 16 SW 14	180
508,0	505,0	-	510,0	2,5	5,0	35	142	540	570	12,7	M 16 SW 14	180
531,0	528,0	-	534,0	2,5	5,0	35	142	565	595	13,2	M 16 SW 14	180
558,8	556,0	-	562,0	2,0	4,5	35	142	590	620	13,7	M 16 SW 14	180
609,6	606,0	-	613,0	1,5	3,0	35	142	640	670	14,7	M 16 SW 14	180
634,0	631,0	-	637,0	1,5	3,0	35	142	665	695	15,1	M 16 SW 14	200
711,2	707,0	-	715,0	1,5	2,5	35	142	745	775	16,6	M 16 SW 14	200

References Subject to technical changes

1.) **MAWP** (maximum allowable working pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.



4.2.3 NORMA**CONNECT® Grip E** (26.9 – 168.3 mm)

Axial restraint pipe coupling for use with metal pipes

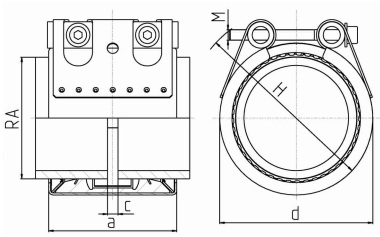
Available in **W2, W4** or **W5** material
Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C, NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range			PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
26,9	26,4	-	27,5	16	70	3	67	50	70	0,32	M 8 SW 6	10
28,0	27,5	-	28,5	16	70	3	67	50	70	0,32	M 8 SW 6	10
30,0	29,5	-	30,6	16	70	3	67	50	70	0,32	M 8 SW 6	10
33,7	33,0	-	34,3	16	60	3	67	55	75	0,33	M 8 SW 6	10
35,0	34,5	-	35,6	16	60	8	63	55	75	0,45	M 8 SW 6	15
38,0	37,5	-	38,6	16	60	8	63	60	80	0,45	M 8 SW 6	15
42,4	41,7	-	43,0	16	50	8	63	65	85	0,46	M 8 SW 6	15
44,5	44,0	-	45,1	16	50	8	63	65	85	0,47	M 8 SW 6	15
48,3	47,6	-	50,5	16	50	8	63	70	90	0,48	M 8 SW 6	15
54,0	53,3	-	54,6	16	50	17	78	75	95	0,62	M 8 SW 6	15
57,0	56,3	-	57,7	16	50	17	78	80	100	0,63	M 8 SW 6	20
60,3	59,5	-	61,0	16	40	17	78	85	105	0,64	M 8 SW 6	20
63,0	62,2	-	63,9	16	40	17	78	85	105	0,64	M 8 SW 6	20
70,0	69,0	-	71,0	16	40	25	98	90	110	1,21	M 10 SW 8	30
73,0	72,1	-	73,8	16	40	25	98	95	115	1,23	M 10 SW 8	30
76,1	75,2	-	77,0	16	35	25	98	100	120	1,23	M 10 SW 8	30
78,0	77,1	-	78,9	16	35	25	98	100	120	1,24	M 10 SW 8	30
80,0	79,0	-	80,8	16	35	25	98	100	120	1,27	M 10 SW 8	30
84,0	83,0	-	85,0	16	35	25	98	105	125	1,29	M 10 SW 8	30
88,9	87,0	-	89,9	16	35	25	98	110	130	1,31	M 10 SW 8	30
101,6	100,4	-	102,8	16	35	25	98	125	145	1,45	M 10 SW 8	30
104,0	102,8	-	106,1	16	35	25	98	125	145	1,46	M 10 SW 8	30
108,0	106,8	-	109,2	16	35	25	98	130	150	1,49	M 10 SW 8	30
110,0	108,8	-	111,4	16	35	25	98	130	150	1,54	M 10 SW 8	30
114,3	113,0	-	115,5	16	35	25	98	135	155	1,54	M 10 SW 8	40
122,0	120,8	-	123,2	16	32	35	115	145	165	2,19	M 12 SW 10	50
129,0	127,6	-	131,1	16	32	35	115	155	185	2,83	M 12 SW 10	50
133,0	131,5	-	134,4	16	32	35	115	160	190	2,93	M 12 SW 10	50
139,7	138,1	-	141,6	16	32	35	115	165	195	3,04	M 12 SW 10	50
141,3	139,6	-	142,8	16	32	35	115	170	200	3,04	M 12 SW 10	50
154,0	152,3	-	156,1	16	32	35	115	180	210	3,17	M 12 SW 10	60
159,0	157,3	-	160,7	16	32	35	115	185	215	3,28	M 12 SW 10	60
168,3	166,5	-	170,1	16	32	35	115	195	225	3,35	M 12 SW 10	60

References Subject to technical changes

1.) **PN** (Nominal Pressure) is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.2.4 NORMA**CONNECT® Grip E** (193.7 – 609.6 mm)



Axial restraint pipe coupling for use with metal pipes

Available in **W2, W4** or **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)
The **Diameter Difference** between the pipes to be joined must not exceed 5 mm.

OD	Clamp. Range		PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min} - OD_{max}					a	d	H			
							clamped				
(mm)	(mm)		(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
193,7	192,0	- 196,0	10,0	20,0	35	141	225	255	6,2	M 16 SW 14	100
206,0	202,0	- 208,0	10,0	20,0	35	141	240	270	6,5	M 16 SW 14	100
219,1	216,0	- 221,0	10,0	20,0	35	141	250	280	6,7	M 16 SW 14	100
225,0	222,0	- 227,0	10,0	16,0	35	140	255	285	6,2	M 16 SW 14	100
229,9	228,0	- 232,0	5,5	16,0	35	140	260	290	6,3	M 16 SW 14	100
244,5	242,0	- 247,0	5,5	15,0	35	140	275	305	6,5	M 16 SW 14	100
254,0	250,0	- 256,0	5,5	14,0	35	140	285	315	6,6	M 16 SW 14	100
267,0	264,0	- 269,0	5,5	13,5	35	140	300	330	6,8	M 16 SW 14	100
273,0	270,0	- 275,0	5,5	13,0	35	140	305	335	6,9	M 16 SW 14	100
306,0	302,0	- 308,0	5,5	10,5	35	140	340	370	7,4	M 16 SW 14	120
323,9	320,0	- 327,0	3,0	9,5	35	140	355	385	7,7	M 16 SW 14	120
326,0	322,0	- 329,0	3,0	9,5	35	140	360	390	7,7	M 16 SW 14	120
355,6	352,0	- 359,0	2,7	8,5	35	140	390	420	8,2	M 16 SW 14	120
406,4	402,0	- 410,0	2,5	7,0	35	140	440	470	8,9	M 16 SW 14	120
429,0	426,0	- 431,0	2,5	6,5	35	140	460	490	9,3	M 16 SW 14	120
442,0	439,0	- 444,0	2,5	6,5	35	140	475	505	9,5	M 16 SW 14	140
457,2	454,0	- 459,0	2,5	6,0	35	140	490	520	9,7	M 16 SW 14	140
508,0	505,0	- 510,0	2,0	4,0	35	140	540	570	10,5	M 16 SW 14	140
531,0	528,0	- 534,0	1,5	4,0	35	140	565	595	10,8	M 16 SW 14	140
558,8	556,0	- 562,0	1,5	3,5	35	140	590	620	11,3	M 16 SW 14	140
609,6	606,0	- 613,0	1,0	2,0	35	140	640	670	12,0	M 16 SW 14	140

References Subject to technical changes

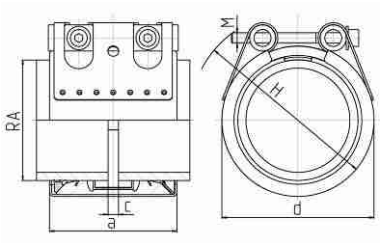
1.) **PN** (Nominal Pressure) is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.3 CombiGrip Series

4.3.1 NORMA**CONNECT®** **CombiGrip E** (40.0 – 168.3 mm)

Axial restraint pipe coupling for joining plastic pipes with metal pipes

Available in **W2** or **W5** material



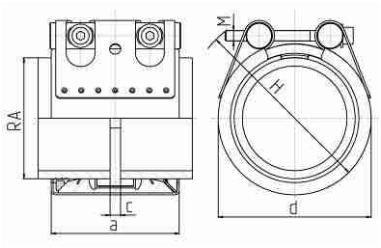
Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range	Clamp. Range	PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min} - OD_{max} Kunststoff	OD_{min} - OD_{max} Metall				a	d	H		Thread	Tightening torque
(mm)	(mm)	(mm)	(bar)	(bar)	(mm)	(mm)	clamped app. (mm)	clamped app. (mm)	approx. (kg/pc.)		(Nm)
40,0 / 38,0	39,0 - 40,5	37,5 - 38,6	10	16	8	62	60	80	0,46	M 8 SW 6	15
40,0 / 42,4	39,0 - 40,5	41,7 - 43,0	10	16	8	62	65	85	0,47	M 8 SW 6	15
42,4 / 42,4	41,7 - 43,0	41,7 - 43,0	10	16	8	62	65	85	0,47	M 8 SW 6	15
48,3 / 48,3	47,6 - 50,5	47,6 - 50,5	10	16	8	62	70	90	0,50	M 8 SW 6	15
50,0 /48,3	49,0 - 50,5	47,6 - 50,5	10	16	8	62	70	90	0,50	M 8 SW 6	15
56,0 / 54,0*	**55,0 - 56,5**	**53,3 - 54,6**	**-**	**5***	**17**	**78**	**80**	**100**	**0,62**	**M 8 SW 6**	**15**
60,3 / 60,3	59,5 - 61,0	59,5 - 61,0	10	16	17	78	85	105	0,65	M 8 SW 6	20
63,0 / 60,3	62,0 - 63,5	59,5 - 61,0	10	16	17	78	85	105	0,65	M 8 SW 6	20
73,0 / 73,0	72,0 - 74,0	72,1 - 73,8	10	16	25	98	95	115	1,30	M 10 SW 8	30
75,0 / 76,1	74,0 - 76,0	75,2 - 77,0	10	16	25	98	100	120	1,30	M 10 SW 8	30
88,9 / 88,9	88,0 - 91,0	87,0 - 89,9	10	16	25	98	110	130	1,39	M 10 SW 8	30
90,0 / 88,9	89,0 - 91,0	87,0 - 89,9	10	16	25	98	110	130	1,39	M 10 SW 8	30
101,6 / 101,6	100,4 - 102,8	100,4 - 102,8	10	16	25	98	125	145	1,54	M 10 SW 8	30
110,0 / 108,0	109,0 - 111,0	106,8 - 109,2	10	16	25	98	130	150	1,58	M 10 SW 8	40
110,0 / 114,3	109,0 - 115,5	113,0 - 115,5	10	16	25	98	135	155	1,62	M 10 SW 8	40
114,3 / 114,3	113,0 - 115,5	113,0 - 115,5	10	16	25	98	135	155	1,62	M 12 SW 10	40
140,0 / 139,7	139,0 - 141,0	138,1 - 141,6	10	16	35	115	160	180	3,14	M 12 SW 10	50
141,3 / 141,3	138,1 - 141,6	139,6 - 142,8	10	16	25	115	165	185	3,14	M 12 SW 10	50
160,0 / 159,0	159,0 - 162,0	157,3 - 160,7	10	16	35	115	180	200	3,45	M 12 SW 10	60
168,3 / 168,3	166,5 - 170,1	166,5 - 170,1	10	16	35	115	190	210	3,48	M 12 SW 10	60

References Subject to technical changes

1.) **PN** (Nominal Pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.
* spezial coupling for joining metal pipes with PE-HD drainage pipes (e.g. Geberit Pluvia HD-PE)

4.3.2 NORMA**CONNECT® CombiGrip** (200.0 – 406.4 mm)



Axial restraint Pipe Coupling for joining plastic pipes with metal pipes

Available in **W2** or **W5** material

Seal: EPDM or NBR
Operating Temperatures:
OD 200,0/204,0 to OD 406,0/406,0 EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range	Clamp. Range	PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min} - OD_{max} Kunststoff	OD_{min} - OD_{max} Metall				a	d clamped	H clamped			
(mm)	(mm)	(mm)	(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
200,0 / 204,0	198,0 - 202,0	202,0 - 206,0	-	16	35	142	235	265	7,5	M 12 SW 10	60
219,1 / 219,1	217,0 - 222,0	216,0 - 221,0	-	16	35	142	250	280	7,9	M 12 SW 10	60
225,0 / 219,1	222,0 - 227,0	216,0 - 221,0	-	10	35	142	255	285	8,1	M 12 SW 10	60
225,0 / 222,0	222,0 - 227,0	220,0 - 224,0	-	10	35	142	255	285	8,1	M 12 SW 10	60
250,0 / 254,0	247,0 - 253,0	250,0 - 256,0	-	10	35	142	285	315	8,6	M 12 SW 10	80
273,0 / 273,0	271,0 - 276,0	270,0 - 275,0	-	10	35	142	305	335	9,1	M 16 SW 14	100
280,0 / 273,0	277,0 - 283,0	270,0 - 275,0	-	10	35	142	310	340	9,3	M 16 SW 14	100
323,9 / 323,9	320,0 - 327,0	320,0 - 327,0	-	6	35	142	355	385	10,2	M 16 SW 14	100
355,0 / 355,6	351,0 - 359,0	352,0 - 359,0	-	6	35	142	390	420	10,9	M 16 SW 14	120
400,0 / 406,4	396,0 - 404,0	402,0 - 410,0	-	6	35	142	440	470	11,9	M 16 SW 14	120
406,0 / 406,4	402,0 - 410,0	402,0 - 410,0	-	6	35	142	440	470	12,0	M 16 SW 14	120

References Subject to technical changes

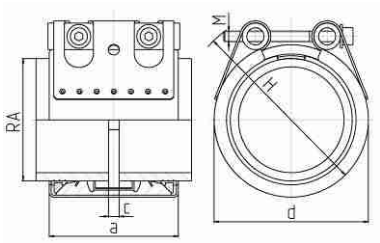
1.) **PN** (Nominal Pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.4 PlastGrip Series

4.4.1 NORMA**CONNECT**® **PlastGrip E** (40.0 – 168.3 mm)

Axial restraint pipe coupling for use with plastic pipes

Available in **W2** or **W5** material



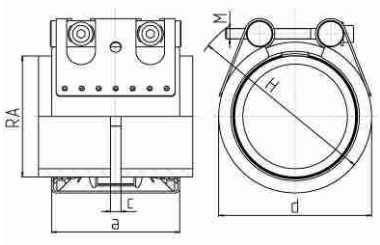
Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range	PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
(mm)	OD_{min} - OD_{max} Kunststoff (mm)	(bar)	(bar)	(mm)	a (mm)	d clamped app. (mm)	H clamped app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
40,0	39,0 - 40,5	10	16	8	62	60	80	0,48	M 8 SW 6	15
42,4	41,7 - 43,0	10	16	8	62	65	85	0,48	M 8 SW 6	15
48,3	47,6 - 49,5	10	16	8	62	70	90	0,52	M 8 SW 6	15
50,0	49,0 - 50,5	10	16	8	62	70	90	0,52	M 8 SW 6	15
60,3	59,5 - 61,0	10	16	17	78	85	105	0,67	M 8 SW 6	20
63,0	62,0 - 63,5	10	16	17	78	85	105	0,67	M 8 SW 6	20
73,0	72,0 - 74,0	10	16	25	98	95	115	1,33	M 10 SW 8	30
75,0	74,0 - 76,0	10	16	25	98	100	120	1,33	M 10 SW 8	30
76,0	75,0 - 77,0	10	16	25	98	100	120	1,33	M 10 SW 8	30
88,9	88,0 - 90,0	10	16	25	98	110	130	1,42	M 10 SW 8	30
90,0	89,0 - 91,0	10	16	25	98	110	130	1,42	M 10 SW 8	30
101,6	100,4 - 102,8	10	16	25	98	125	145	1,58	M 10 SW 8	30
110,0	109,0 - 111,0	10	16	25	98	130	150	1,66	M 10 SW 8	30
114,3	113,0 - 115,5	10	16	25	98	135	155	1,66	M 12 SW 10	40
140,0	139,0 - 141,0	10	16	35	115	160	180	3,18	M 12 SW 10	50
141,3	138,1 - 141,6	10	16	25	115	165	185	3,19	M 12 SW 10	50
160,0	159,0 - 162,0	10	16	35	115	180	200	3,45	M 12 SW 10	60
168,3	166,5 - 170,1	10	16	35	115	190	210	3,48	M 12 SW 10	60

References Subject to technical changes

1.) **PN** (Nominal Pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.4.2 NORMA**CONNECT®** **PlastGrip** (180.0 – 406.4 mm)



Axial restraint Pipe Coupling for use with plastic pipes

Available in **W2** or **W5** material
Seal: EPDM or NBR
Operating Temperatures:
OD 200,0 to OD 406,0 EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range	PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
(mm)	OD_{min} - OD_{max} Kunststoff (mm)	(bar)	(bar)	(mm)	a (mm)	d app. (mm) clamped	H app. (mm) clamped	approx. (kg/pc.)	Thread	Tightening torque (Nm)
180,0	178,0 - 182,0	-	16	35	142	210	240	7,6	M 12 SW 10	60
200,0	198,0 - 202,0	-	16	35	142	230	260	8,1	M 12 SW 10	60
219,1	217,0 - 222,0	-	16	35	142	250	280	8,6	M 12 SW 10	60
225,0	222,0 - 227,0	-	10	35	142	255	285	8,7	M 12 SW 10	60
250,0	247,0 - 253,0	-	10	35	142	280	310	9,4	M 12 SW 10	80
273,0	271,0 - 276,0	-	10	35	142	305	335	9,9	M 16 SW 14	100
280,0	277,0 - 283,0	-	10	35	142	310	340	10,1	M 16 SW 14	100
315,0	311,0 - 318,0	-	10	35	142	345	375	11,0	M 16 SW 14	100
323,9	320,0 - 327,0	-	6	35	142	355	385	11,2	M 16 SW 14	100
355,0	352,0 - 359,0	-	6	35	142	385	415	12,0	M 16 SW 14	120
400,0	396,0 - 404,0	-	6	35	142	430	460	13,1	M 16 SW 14	120
406,4	402,0 - 410,0	-	6	35	142	440	470	13,3	M 16 SW 14	120

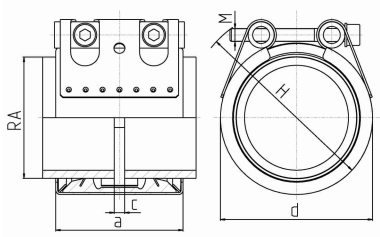
References Subject to technical changes

1.) **PN** (Nominal Pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.5 Rep Series

4.5.1 NORMA**CONNECT**® **Rep E** (35.0 – 170.0 mm)

Axial non-restraint repair coupling for use with virtually all pipe materials



Available in **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C
and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (WP)

OD	Clamp. Range			WP[1]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}			a	d	H			
							clamped				
(mm)	(mm)			(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
35,0	34,5	-	35,6	60	8	63	55	75	0,41	M 8 SW 6	5
38,0	37,5	-	38,6	60	8	63	60	80	0,41	M 8 SW 6	5
42,4	41,7	-	43,0	50	8	63	65	85	0,42	M 8 SW 6	5
44,5	44,0	-	45,1	50	8	63	65	85	0,43	M 8 SW 6	5
48,3	47,6	-	50,5	50	8	63	70	90	0,44	M 8 SW 6	5
54,0	53,3	-	54,6	50	17	78	75	95	0,58	M 8 SW 6	10
57,0	56,3	-	57,7	50	17	78	80	100	0,58	M 8 SW 6	10
60,3	59,5	-	61,0	40	17	78	85	105	0,59	M 8 SW 6	10
63,0	62,2	-	63,9	40	17	78	85	105	0,59	M 8 SW 6	10
70,0	69,0	-	71,0	40	25	98	90	110	1,11	M 8 SW 6	10
73,0	72,1	-	73,8	40	25	98	95	115	1,13	M 8 SW 6	10
76,1	75,2	-	77,0	35	25	98	100	120	1,13	M 8 SW 6	10
78,0	77,1	-	78,9	35	25	98	100	120	1,14	M 8 SW 6	15
80,0	79,0	-	80,8	35	25	98	100	120	1,16	M 8 SW 6	15
84,0	83,0	-	85,0	35	25	98	105	125	1,18	M 8 SW 6	15
88,9	87,0	-	89,9	35	25	98	110	130	1,20	M 8 SW 6	15
101,6	100,4	-	102,8	35	25	98	125	145	1,32	M 8 SW 6	15
104,0	102,8	-	106,1	35	25	98	125	145	1,33	M 8 SW 6	15
108,0	106,8	-	109,2	35	25	98	130	150	1,36	M 8 SW 6	15
110,0	108,8	-	111,4	35	25	98	130	150	1,40	M 8 SW 6	15
114,3	113,0	-	115,5	35	25	98	135	155	1,40	M 8 SW 6	20
122,0	120,8	-	123,2	32	35	113	145	165	1,99	M 10 SW 8	30
129,0	127,6	-	131,1	32	35	113	155	185	2,00	M 10 SW 8	30
133,0	131,5	-	134,4	32	35	113	160	190	2,03	M 10 SW 8	30
139,7	138,1	-	141,6	32	35	113	165	195	2,08	M 10 SW 8	35
141,3	139,6	-	142,8	32	35	113	170	200	2,09	M 10 SW 8	35
154,0	152,3	-	156,1	32	35	113	180	210	2,19	M 10 SW 8	50
159,0	157,3	-	160,7	32	35	113	185	215	2,26	M 10 SW 8	50
168,3	166,5	-	170,1	32	35	113	195	225	2,31	M 10 SW 8	50

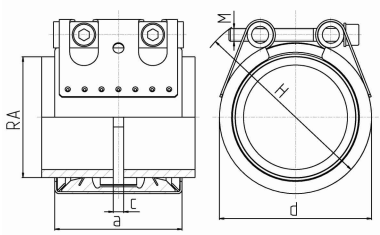
References Subject to technical changes

[1] **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.5.2 NORMA**CONNECT**® **Rep E** (180.0 – 1219.2 mm)

Axial non-restraint repair coupling for use with virtually all pipe materials

Available in **W2, W4** or **W5** material



Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (WP)

Sizes > 1219,2 on request

OD	Clamp. Range			WP[1)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}			a	d	H			
							clamped				
(mm)	(mm)			(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
180,0	178,0	-	182,0	30,0	35	139	210	240	4,0	M 12 SW 10	25,0
193,7	192,0	-	196,0	28,0	35	139	225	255	4,1	M 12 SW 10	25,0
206,0	202,0	-	208,0	26,5	35	139	240	270	4,3	M 12 SW 10	25,0
219,1	216,0	-	221,0	23,0	35	139	250	280	4,4	M 12 SW 10	25,0
225,0	222,0	-	227,0	23,0	35	139	255	285	4,5	M 12 SW 10	25,0
229,9	228,0	-	232,0	23,0	35	139	260	290	4,5	M 12 SW 10	25,0
244,5	242,0	-	247,0	22,0	35	139	275	305	4,7	M 12 SW 10	25,0
254,0	250,0	-	256,0	21,0	35	139	285	315	4,8	M 12 SW 10	25,0
267,0	264,0	-	269,0	20,0	35	139	300	330	5,0	M 12 SW 10	25,0
273,0	270,0	-	275,0	20,0	35	139	305	335	5,1	M 12 SW 10	25,0
306,0	302,0	-	308,0	17,5	35	139	340	370	5,5	M 12 SW 10	25,0
323,9	320,0	-	327,0	17,5	35	139	355	385	5,7	M 12 SW 10	25,0
326,0	322,0	-	329,0	16,5	35	139	360	390	5,7	M 12 SW 10	25,0
355,6	352,0	-	359,0	15,0	35	139	390	420	6,0	M 12 SW 10	25,0
406,4	402,0	-	410,0	14,0	35	139	440	470	6,6	M 12 SW 10	25,0
429,0	426,0	-	431,0	13,0	35	139	460	490	6,9	M 12 SW 10	40,0
442,0	439,0	-	444,0	13,0	35	139	475	505	7,1	M 12 SW 10	40,0
457,2	454,0	-	459,0	12,0	35	139	490	520	7,3	M 12 SW 10	40,0
508,0	505,0	-	510,0	11,0	35	139	540	570	7,9	M 12 SW 10	40,0
531,0	528,0	-	534,0	10,5	35	139	565	595	8,1	M 12 SW 10	40,0
558,8	556,0	-	562,0	10,0	35	139	590	620	8,5	M 12 SW 10	40,0
609,6	606,0	-	613,0	9,0	35	139	640	670	9,1	M 12 SW 10	40,0
634,0	631,0	-	637,0	8,0	35	139	665	695	9,4	M 12 SW 10	40,0
711,2	707,0	-	715,0	7,0	35	139	745	775	10,3	M 12 SW 10	40,0
762,0	758,0	-	766,0	7,0	35	139	795	825	10,9	M 12 SW 10	40,0
812,8	808,0	-	817,0	6,5	35	139	845	875	11,5	M 12 SW 10	40,0
914,4	909,0	-	919,0	5,5	35	139	945	975	12,7	M 12 SW 10	45,0
1016,0	1013,0	-	1019,0	5,0	35	139	1050	1080	13,9	M 12 SW 10	45,0
1117,5	1114,0	-	1120,0	4,5	35	139	1150	1180	15,1	M 12 SW 10	50,0
1219,2	1216,0	-	1222,0	4,0	35	139	1250	1280	16,3	M 12 SW 10	50,0

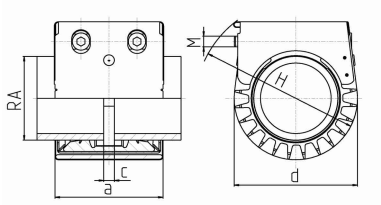
References Subject to technical changes

1.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

4.6 Fire Protected (FP) Series

4.6.1 NORMA**CONNECT®** **Flex E FP** (26.9 – 168.3 mm) with integrated fire protected

Axial non-restraint Pipe Coupling for use with virtually all pipe materials



Available in **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM -30°C to +125°C,
NBR -20°C to +80°C
Test Pressure: 1.5 working pressure (PN or WP)

OD	Clamp. Range			PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
26.9	26,4	-	27,5	16	70	3	67	60	110	0,41	M 8 SW 6	5
28.0	27,5	-	28,5	16	70	3	67	60	110	0,41	M 8 SW 6	5
30.0	29,5	-	30,6	16	70	3	67	60	110	0,41	M 8 SW 6	5
33.7	33,0	-	34,3	16	60	3	67	65	115	0,42	M 8 SW 6	5
35,0	34,5	-	35,6	10	35	8	63	65	115	0,56	M 8 SW 6	5
38,0	**37,5**	**-**	**38,6**	**10**	**35**	**8**	**63**	**70**	**120**	**0,56**	**M 8 SW 6**	**5**
42,4	**41,7**	**-**	**43,0**	**10**	**35**	**8**	**63**	**75**	**125**	**0,57**	**M 8 SW 6**	**5**
44,5	44,0	-	45,1	10	35	8	63	75	125	0,58	M 8 SW 6	5
48,3	**47,6**	**-**	**50,5**	**10**	**35**	**8**	**63**	**80**	**130**	**0,59**	**M 8 SW 6**	**5**
54,0	53,3	-	54,6	16	50	17	78	85	135	0,76	M 8 SW 6	10
57,0	**56,3**	**-**	**57,7**	**16**	**50**	**17**	**78**	**90**	**140**	**0,78**	**M 8 SW 6**	**10**
60,3	**59,5**	**-**	**61,0**	**16**	**40**	**17**	**78**	**95**	**145**	**0,79**	**M 8 SW 6**	**10**
63,0	62,2	-	63,9	16	40	17	78	95	145	0,79	M 8 SW 6	10
73,0	72,1	-	73,8	16	40	25	98	105	155	1,44	M 8 SW 6	10
76,1	**75,2**	**-**	**77,0**	**16**	**35**	**25**	**98**	**110**	**160**	**1,44**	**M 8 SW 6**	**10**
84,0	83,0	-	85,0	16	35	25	98	115	165	1,51	M 8 SW 6	10
88,9	**87,0**	**-**	**89,9**	**16**	**35**	**25**	**98**	**120**	**170**	**1,54**	**M 8 SW 6**	**10**
101,6	100,4	-	102,8	16	35	25	98	135	185	1,69	M 8 SW 6	10
104,0	102,8	-	106,1	16	35	25	98	135	185	1,70	M 8 SW 6	10
108,0	**106,8**	**-**	**109,2**	**16**	**35**	**25**	**98**	**140**	**190**	**1,72**	**M 8 SW 6**	**10**
114,3	**113,0**	**-**	**115,5**	**16**	**35**	**25**	**98**	**145**	**195**	**1,82**	**M 8 SW 6**	**15**
129,0	127,6	-	131,1	16	32	35	113	165	215	2,52	M 10 SW 8	20
133,0	**131,5**	**-**	**134,4**	**16**	**32**	**35**	**113**	**170**	**220**	**2,56**	**M 10 SW 8**	**20**
139,7	138,1	-	141,6	16	32	35	113	175	225	2,63	M 10 SW 8	25
141,3	139,6	-	142,8	16	32	35	113	180	230	2,63	M 10 SW 8	25
154,0	152,3	-	156,1	16	32	35	113	190	240	2,77	M 10 SW 8	30
159,0	**157,3**	**-**	**160,7**	**16**	**32**	**35**	**113**	**195**	**245**	**2,85**	**M 10 SW 8**	**30**
168,3	**166,5**	**-**	**170,1**	**16**	**32**	**35**	**113**	**205**	**255**	**2,91**	**M 10 SW 8**	**30**

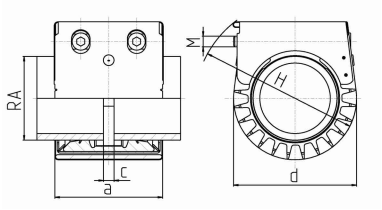
References Subject to technical changes

1.) **PN** (Nominal Pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

bold print: sizes approved in shipbuilding
further sizes on request

4.6.2 NORMA**CONNECT®** **Flex E FP** (180.0 – 419.0 mm) with integrated fire protected

Axial non-restraint Pipe Coupling for use with virtually all pipe materials



Available in **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (MAWP or WP)
The **Diameter Difference** between the pipes to be joined must not exceed 5 mm.

OD	Clamp. Range	MAWP[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
(mm)	OD_{min} - OD_{max} (mm)	(bar)	(bar)	(mm)	a (mm)	d clamped app. (mm)	H clamped app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
180,0	178,0 - 182,0	13,5	30,0	35	155	225	255	4,6	M 12 SW 10	25
193,7	**192,0 - 196,0**	**13,5**	**28,0**	**35**	**155**	**240**	**270**	**4,8**	**M 12 SW 10**	**25**
206,0	**202,0 - 208,0**	**13,5**	**26,5**	**35**	**155**	**250**	**280**	**5,0**	**M 12 SW 10**	**25**
219,1	**216,0 - 221,0**	**13,5**	**23,0**	**35**	**155**	**255**	**285**	**5,2**	**M 12 SW 10**	**25**
225,0	222,0 - 227,0	12,0	23,0	35	155	260	290	5,3	M 12 SW 10	25
229,9	228,0 - 232,0	12,0	23,0	35	155	275	305	5,3	M 12 SW 10	25
244,5	242,0 - 247,0	12,0	22,0	35	155	285	315	5,5	M 12 SW 10	25
254,0	250,0 - 256,0	12,0	21,0	35	155	300	330	5,7	M 12 SW 10	25
267,0	**264,0 - 269,0**	**12,0**	**20,0**	**35**	**155**	**305**	**335**	**5,9**	**M 12 SW 10**	**25**
273,0	**270,0 - 275,0**	**12,0**	**20,0**	**35**	**155**	**340**	**370**	**6,0**	**M 12 SW 10**	**25**
306,0	302,0 - 308,0	9,0	17,5	35	155	355	385	6,4	M 12 SW 10	25
323,9	**320,0 - 327,0**	**9,0**	**17,5**	**35**	**155**	**360**	**390**	**6,7**	**M 12 SW 10**	**25**
326,0	322,0 - 329,0	9,0	16,5	35	155	390	420	6,7	M 12 SW 10	25
355,6	**352,0 - 359,0**	**9,0**	**15,0**	**35**	**155**	**440**	**470**	**7,1**	**M 12 SW 10**	**25**
406,4	**402,0 - 410,0**	**7,5**	**14,0**	**35**	**155**	**460**	**520**	**7,9**	**M 12 SW 10**	**25**
419,0	**415,0 - 422,0**	**5,5**	**13,0**	**35**	**155**	**460**	**510**	**8,1**	**M 12 SW 11**	**40**

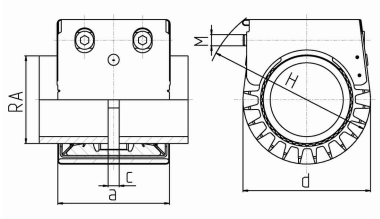
References Subject to technical changes

1.) **MAWP** (maximum allowable working pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

bold print: sizes approved in shipbuilding
further sizes on request

4.6.3 NORMA**CONNECT**® **Grip E FP** (26.9 – 168.3 mm) with integrated fire protected

Axial restraint Pipe Coupling for use with virtually all pipe materials



Available in **W5** material

Seal: EPDM or NBR or FPM/FKM[3)]
Operating Temperatures: EPDM -30°C to +125°C,
NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (PN or WP)

OD	Clamp. Range			PN[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min}	-	OD_{max}				a	d	H			
								clamped				
(mm)	(mm)			(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
26,9	26,4	-	27,5	16	70	3	67	60	110	0,42	M 8 SW 6	10
28,0	27,5	-	28,5	16	70	3	67	60	110	0,42	M 8 SW 6	10
30,0	29,5	-	30,6	16	70	3	67	60	110	0,42	M 8 SW 6	10
33,7	33,0	-	34,3	16	60	3	67	65	115	0,43	M 8 SW 6	10
35,0	34,5	-	35,6	16	60	8	75	65	115	0,58	M 8 SW 6	15
38,0	**37,5**	**-**	**38,6**	**16**	**60**	**8**	**75**	**70**	**120**	**0,58**	**M 8 SW 6**	**15**
42,4	**41,7**	**-**	**43,0**	**16**	**50**	**8**	**75**	**75**	**125**	**0,59**	**M 8 SW 6**	**15**
44,5	44,0	-	45,1	16	50	8	75	75	125	0,60	M 8 SW 6	15
48,3	**47,6**	**-**	**50,5**	**16**	**50**	**8**	**75**	**80**	**130**	**0,61**	**M 8 SW 6**	**15**
54,0	53,3	-	54,6	16	50	17	90	85	135	0,92	M 8 SW 6	15
57,0	**56,3**	**-**	**57,7**	**16**	**50**	**17**	**90**	**90**	**140**	**0,93**	**M 8 SW 6**	**20**
60,3	**59,5**	**-**	**61,0**	**16**	**40**	**17**	**90**	**95**	**145**	**0,94**	**M 8 SW 6**	**20**
63,0	62,2	-	63,9	16	40	17	90	95	145	0,94	M 8 SW 6	20
73,0	72,1	-	73,8	16	40	25	110	105	155	1,49	M 10 SW 8	30
76,1	**75,2**	**-**	**77,0**	**16**	**35**	**25**	**110**	**110**	**160**	**1,49**	**M 10 SW 8**	**30**
84,0	83,0	-	85,0	16	35	25	110	115	165	1,56	M 10 SW 8	30
88,9	**87,0**	**-**	**89,9**	**16**	**35**	**25**	**110**	**120**	**170**	**1,59**	**M 10 SW 8**	**30**
101,6	100,4	-	102,8	16	35	25	110	135	185	1,75	M 10 SW 8	30
104,0	102,8	-	106,1	16	35	25	110	135	185	1,76	M 10 SW 8	30
108,0	**106,8**	**-**	**109,2**	**16**	**35**	**25**	**110**	**140**	**190**	**1,79**	**M 10 SW 8**	**30**
114,3	**113,0**	**-**	**115,5**	**16**	**35**	**25**	**110**	**145**	**195**	**1,89**	**M 10 SW 8**	**40**
129,0	127,6	-	131,1	16	32	35	125	165	215	3,25	M 12 SW 10	50
133,0	**131,5**	**-**	**134,4**	**16**	**32**	**35**	**125**	**170**	**220**	**3,36**	**M 12 SW 10**	**50**
139,7	138,1	-	141,6	16	32	35	125	175	225	3,48	M 12 SW 10	50
141,3	139,6	-	142,8	16	32	35	125	180	230	3,48	M 12 SW 10	50
154,0	152,3	-	156,1	16	32	35	125	190	240	3,63	M 12 SW 10	60
159,0	**157,3**	**-**	**160,7**	**16**	**32**	**35**	**125**	**195**	**245**	**3,75**	**M 12 SW 10**	**60**
168,3	**166,5**	**-**	**170,1**	**16**	**32**	**35**	**125**	**205**	**255**	**3,83**	**M 12 SW 10**	**60**

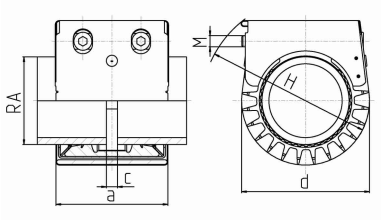
References Subject to technical changes

1.) **PN** (Nominal Pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

bold print: sizes approved in shipbuilding
further sizes on request

VdS approved sizes
Note: OD 114,3 approved only for PN12,5 and OD 139,7 approved only for PN 10!
Also VdS approval for OD 33,7 PN 16 with textile fire protection hood

4.6.4 NORMA**CONNECT®** **Grip E FP** (193.7 – 419.0 mm) with integrated fire protected



Axial restraint Pipe Coupling for use with virtually all pipe materials

Available in **W5** material

Seal: EPDM or NBR
Operating Temperatures: EPDM and NBR -20°C to +80°C
Test Pressure: 1.5 x working pressure (MAWP or WP)

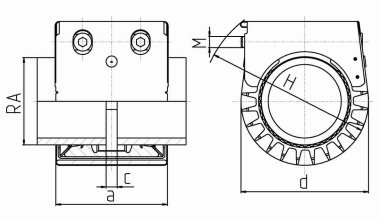
OD	Clamp. Range	MAWP[1)]	WP[2)]	C_{max}	Dimensions			Weight	Hex socket locking bolts	
	OD_{min} - OD_{max}				a	d	H			
						clamped				
(mm)	(mm)	(bar)	(bar)	(mm)	(mm)	app. (mm)	app. (mm)	approx. (kg/pc.)	Thread	Tightening torque (Nm)
193,7	**192,0 - 196,0**	**10,0**	**20,0**	**35**	**155**	**235**	**285**	**6,9**	**M 16 SW 14**	**100**
206,0	**202,0 - 208,0**	**10,0**	**20,0**	**35**	**155**	**250**	**300**	**7,2**	**M 16 SW 14**	**100**
219,1	**216,0 - 221,0**	**10,0**	**20,0**	**35**	**155**	**260**	**310**	**7,4**	**M 16 SW 14**	**100**
225,0	222,0 - 227,0	10,0	16,0	35	155	265	315	7,0	M 16 SW 14	100
229,9	228,0 - 232,0	5,5	16,0	35	155	270	320	7,0	M 16 SW 14	100
244,5	242,0 - 247,0	5,5	15,0	35	155	285	335	7,3	M 16 SW 14	100
254,0	250,0 - 256,0	5,5	14,0	35	155	285	335	7,5	M 16 SW 14	100
267,0	**264,0 - 269,0**	**5,5**	**13,5**	**35**	**155**	**310**	**360**	**7,7**	**M 16 SW 14**	**100**
273,0	**270,0 - 275,0**	**5,5**	**13,0**	**35**	**155**	**315**	**365**	**7,8**	**M 16 SW 14**	**100**
306,0	302,0 - 308,0	5,5	10,5	35	155	350	400	8,4	M 16 SW 14	120
323,9	**320,0 - 327,0**	**3,0**	**9,5**	**35**	**155**	**365**	**415**	**8,7**	**M 16 SW 14**	**120**
326,0	322,0 - 329,0	3,0	9,5	35	155	370	420	8,8	M 16 SW 14	120
355,6	**352,0 - 359,0**	**2,7**	**8,5**	**35**	**155**	**400**	**450**	**9,3**	**M 16 SW 14**	**120**
406,4	**402,0 - 410,0**	**2,5**	**7,0**	**35**	**155**	**450**	**500**	**10,2**	**M 16 SW 14**	**120**
419,0	**415,0 - 422,0**	**2,5**	**6,5**	**35**	**155**	**460**	**510**	**10,4**	**M 16 SW 14**	**180**

References Subject to technical changes

1.) **MAWP** (maximum allowable working pressure)
is the max. admissible working pressure in shipbuilding, based on a safety factor of ≥ 4.
2.) **WP** is the max. working pressure in industrial applications, with a safety factor as per NORMA specification.

bold print: sizes approved in shipbuilding
further sizes on request

4.6.5 NORMA**CONNECT® RFP** (26.9 – 273.0 mm) retrofittable fire protector



Retrofittable Fire protector for NC FGR couplings Grip / Grip E / Flex / Flex E

Available in **W5**

Fire Protection Mat: mineral fibre mat

OD of FGR coupling mm	a	d	*H appr. (mm)	Weight of RFP housing (kg/piece)
26,9	69	60	110	0,09
28,0	69	60	110	0,09
30,0	69	60	110	0,1
33,7	69	65	115	0,10
38,0	75	70	120	0,11
42,4	75	75	125	0,12
44,5	75	75	125	0,12
48,3	75	80	130	0,13
54,0	90	90	135	0,14
57,0	90	90	140	0,16
60,3	90	95	145	0,16
76,1	110	110	160	0,24
88,9	110	120	170	0,26
101,6	110	135	185	0,28
104,0	110	135	185	0,29
108,0	110	140	190	0,30
114,3	110	145	195	0,31
133,0	125	170	220	0,41
139,7	125	175	225	0,43
154,0	125	190	240	0,45
159,0	125	195	245	0,49
168,3	125	205	255	0,50
219,1	155	260	310	0,73
273,0	155	315	365	0,87

*Dimensions of the housing are given as assembled on a **NORMACONNECT®** Grip/ Grip E/ Flex/ Flex E pipe coupling. Further sizes available on request.

4.7 Minimum wall thickness indications for common pipe materials

These minimum pipe wall thicknesses are to be seen as a rule-of-thumb indication for a pressure load of PN, and are supplied without liability (for the respective PN values of the individual pipe coupling types cf. the technical data sheets).

* not for shipbuilding applications

OD →Ø← (mm)	Stainl.Steel (304/304 S31) (316Ti/320 S31) s = min	Mild steel St 37-2* (12L14/230 M07) s = min	Copper Nickel Pipe s = min	Copper Cu-R290 s = min	Cast Iron (ductile) s = min	Plastic Pipe (SN10.000) s = min	OD →Ø← (inch)	USA A29 / 1015 ASTM / SAE Schedule No.
26.9	1.0	1.0	-	-	-	-	¾	5
28.0	1.0	1.0	1.5	1.5	-	-	-	-
30.0	1.2	1.2	1.5	1.5	-	-	-	-
33.7	1.2	1.2	-	-	-	-	1	5
35.0	1.2	1.2	-	1.5	-	-	-	-
38.0	1.6	1.6	1.5	1.5	-	-	-	-
42.4	1.6	1.6	-	1.5	-	-	1 ¼	5
44.5	1.6	1.6	1.5	1.5	-	-	-	-
48.3	1.6	1.6	-	-	-	-	1 ½	5
54.0	1.6	1.6	-	1.5	-	-	-	-
57.0	1.6	1.6	2.0	2.0	-	-	-	-
60.3	1.6	1.6	-	-	-	-	2	5
73.0	2.0	2.0	-	-	-	-	2 ½	5
76.1	2.0	2.0	2.0	2.0	-	-	-	-
78.0	2.0	2.0	-	-	-	-	-	-
84.0	2.0	2.0	-	-	-	-	-	-
88.9	2.0	2.0	2.0	2.0	-	-	3	5
98.0	2.3	2.3	-	-	6.0	-	-	-
101.6	2.3	2.3	-	-		-	3 ½	5
104.0	2.3	2.3	-	-	-	-	-	-
108.0	2.3	2.3	2.5	2.5	-	-	-	-
110.0	2.3	2.3	-	-	-	-	-	-
114.3	2.3	2.3	-	-	-	-	4	5
118.0	2.3	2.3	-	-	6.0	3.1	-	-
128.0	2.3	2.3	-	-	-	-	-	-
133.0	2.3	2.3	2.5	3.0	-	-	-	-
139.7	2.3	2.3	-	-	-	-	-	-
141.3	2.3	2.3	-	-	-	3.7	5	5
144.0	2.3	2.3	-	-	6.2	-	-	-
154.0	2.6	2.6	-	-	-	-	-	-
159.0	2.6	2.6	2.5	3.0	-	-	-	-
168.3	2.6	2.6	-	-	-	4.3	6	5
170.0	2.6	2.6	-	-	6.0	-	-	-
177.8	2.6	2.6	-	-	-	-	-	-
193.7	2.6	2.6	3.0	-	-	-	-	-
204.0	2.6	2.6	-	-	-	-	-	-
219.1	2.6	2.6	3.0	3.0	-	-	8	5
222.0	2.6	2.6	-	-	6.3	5.5	-	-
244.5	2.6	2.6	-	-	-	-	-	-
256.0	2.9	2.9	-	-	-	-	-	-
267.0	3.2	3.2	3.0	3.0	-	-	-	-
274.0	3.2	3.2	4.0	-	6.8	6.1	10	5
304.0	3.2	3.2	-	-	-	-	-	-
323.9	3.6	3.6	4.0	-	-	6.1	12	5
326.0	3.6	3.6	-	-	7.2	-	-	-
355.6	3.6	3.6	-	-	-	-	14	5
368.0	3.6	3.6	4.0	-	-	-	-	-
378.0	3.6	3.6	-	-	7.7	7.1	-	-
404.0	3.6	3.6	-	-	-	-	-	-
406.4	4.0	4.0	-	-	-	-	16	5
419.0	4.0	4.0	4.0	-	-	-	-	-
429.0	4.0	4.0		-	8.1	8.1	-	-
457.2	4.0	4.0	4.5	-	-	-	18	5
478.2	4.0	4.0	-	-	-	9.0		
508.0	5.0	5.0	5.0	-	-	-	20	5
532.0	5.0	5.0	-	-	9.0	10.1	-	-
558.8	6.3	6.3	-	-	-	-	-	-
609.6	6.3	6.3	5.0	-	-	-	24	10
635.0	6.3	6.3	-	-	9.9	-	-	-
711.2	7.1	7.1	-	-	-	-	-	-

5. FITTING / REFITTING OF NORMA**CONNECT®** PIPE COUPLINGS

5.1 General Assembling Instructions

The complete NORMA**CONNECT® pipe couplings range distinguishes by constant, simple and quick fitting.**

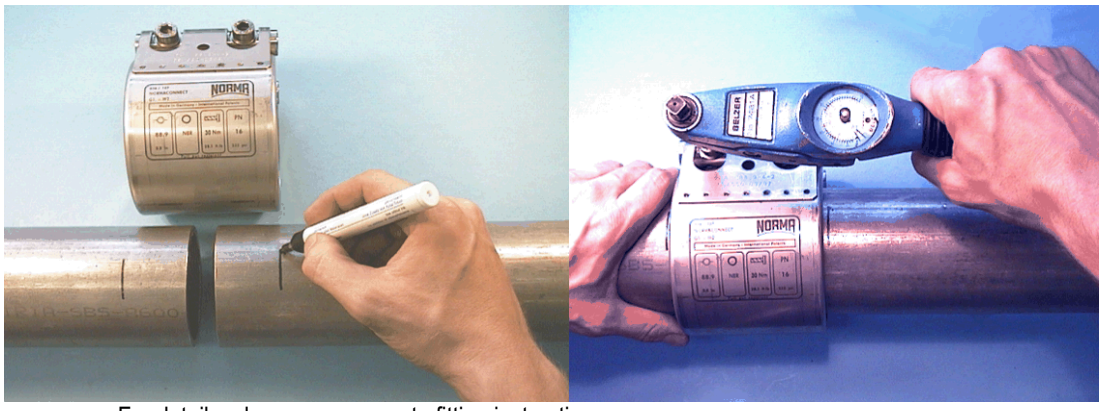
Independent of pipe material NORMA**CONNECT®** pipe couplings are applied on untreated, plain-ended pipes.

Simple fitting

- cut pipes to size
- for plastic pipes made from soft thermoplastic materials, use NORMA**CONNECT®** support sleeves
- butt pipe ends
- mark half width of coupling on both pipe ends
- slide coupling over one pipe end
- align between pipe marks
- tighten both lock bolts with a torque wrench

Quick pipe installation

- no pipe-end treatment
- coupling ready for fitting
- lock rotatable and always accessible
- no costly pipe alignment work



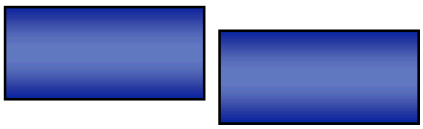
For details, please see separate fitting instructions

5.1.1 Assembly Tollerances

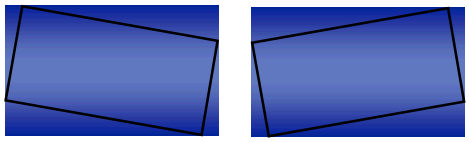
The NORMA**CONNECT**® pipe couplings offer special assembly tolerances to the installer:

Distance between pipe ends C_{max} (see 5.1.4)
3 to 65 mm according to dimensions

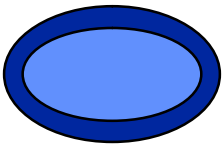
Axial misalignment (see 5.1.6)
≤1% of the outer dimension of the pipe, but not more than max. 3 mm



Angular deflection (see 5.1.5)
2° two one each site (= 4° in total)



Pipe ovality
2 % of the outer dimension of the pipe ,
according to dimension tollerances of production norms for pipes



Axial movement (see 5.2.1)
To be compensated (Flex Series, only)

OD < 33,7 mm	=> elongation max. 1,0 mm per side (2 mm in total)
OD 35 to 170 mm	=> elongation max. 2,5 mm per side (5 mm in total)
OD 171 to 1200 mm	=> elongation max. 5,0 mm per side (10 mm in total)
Flex 3	=> elongation max. 7,5 mm per side (15 mm in total)

Outer diemeter differences
≤2 % of the outer dimension of the pipe, up to 5 mm

5.1.2 Fitting Times for NORMA**CONNECT®** Pipe Couplings

The fitting time contains

- marking of half width of coupling symmetrically on both pipe ends
- sliding of coupling over one pipe end
- positioning of coupling
- tightening of lock bolts with torque wrench

OD [mm]	Nominal Width [Zoll]	Nominal Width [mm]	Fitting time per coupling in minutes	OD [mm]	Nominal Width [Zoll]	Nominal Width [mm]	Fitting time per coupling in minutes
26,9	½	15	2	306,0			12
28,0			2	317,0			12
30,0		25	2	323,9	12	300	12
33,7	1	25	2	326,0			12
35,0			2 ½	343,0			12
38,0		32	2 ½	355,6	14	350	12
42,4	1 ¼	32	2 ½	368,0			12
44,5		40	2 ½	377,0			12
48,3	1 ½	40	2 ½	406,4	16	400	12
54,0			3	419,0			12
57,0		50	3	429,0			12
60,3	2	50	3	457,0			12
76,1	2 ½	65	4	479,0			12
84,0			4	508,0	20	500	12
88,9	3	80	4	531,0			12
104,0			5	559,0			12
108,0		100	5	609,0	24	600	12
114,3	4	100	5	634,0			12
129,0			6	660,0			12
133,0		125	6	711,0	28	700	12
139,7		125	6	762,0			12
154,0			7	812,8	32	800	12
159,0		150	7	864,0			12
168,3	6	150	7	914,0			12
177,8			9	1.016,0			12
192,0			9	1.124,0			12
200,0			9	1.200,0			12
206,0			9	1.220,0	48	1200	12
210,0			9				
216,0			9				
219,1	8	200	9				
221,0			10				
244,5			10				
252,5			10				
267,0			10				
273,0	10	250	10				

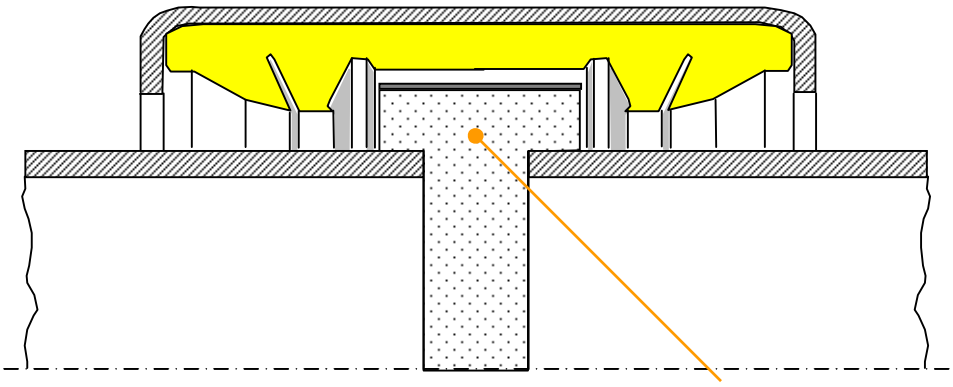
5.1.3 Strip Inserts

NORMA**CONNECT**® pipe couplings are factory equipped with strip inserts.

The inserts are important for applications under vacuum, major pipe end distances, oblique pipe ends or media which cause rubber swelling like combustibles, oils, etc.

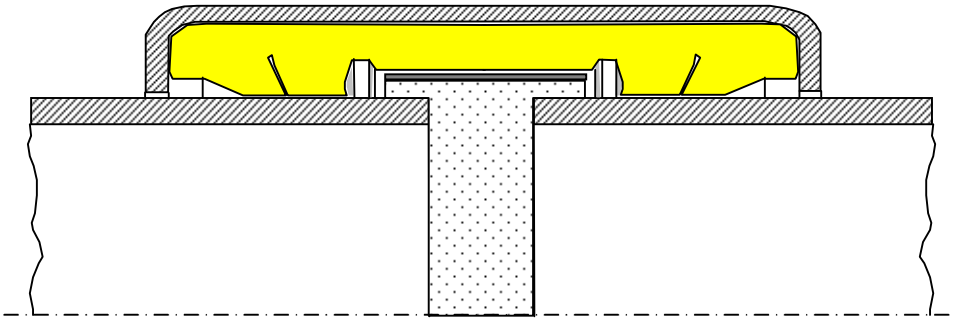
The strip insert protects the middle part of the sealing sleeve against possible damage by pipe ends. Especially under axial movement and additional angular deflection.

Coupling, not tightened



strip insert prevents the seal from entering the pipe gap

Coupling, tightened



5.1.4 Distance between pipe ends

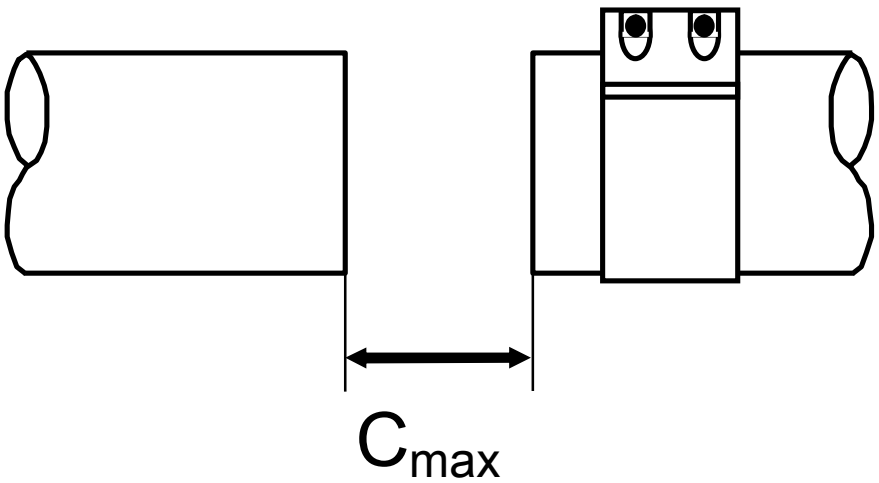
NORMA**CONNECT**® pipe couplings can be fitted with or without gap between the pipe ends without any impairment to function.

Even if the pipes have been cut too short or oblique, the serially applied strip insert will compensate such trouble.

The maximum distance between the pipe ends C_{max} (see fitting instructions or technical data sheet) must not be exceeded.

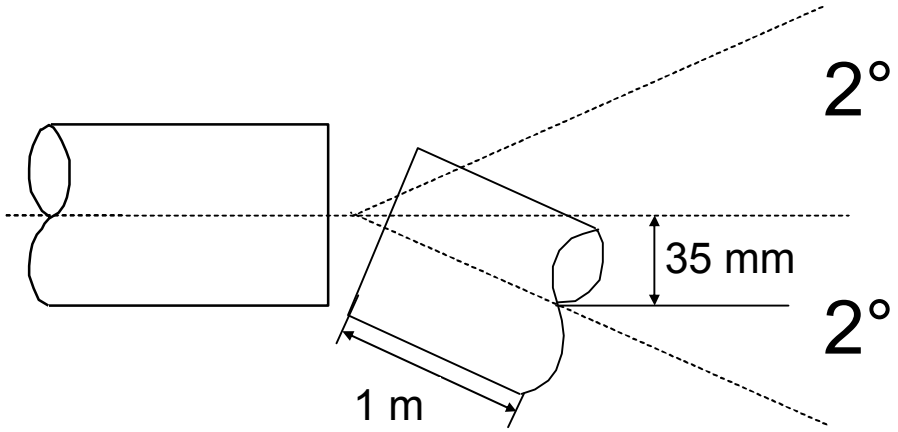
OD [mm]	C_{max} [mm]
26,9 - 33	3
35 - 48	8
54 - 60	17
76 - 114	25
129 - 168	35
180 - 1219	35
326 - 2032 (F-3)	65

Note: Make sure the strip insert is fitted inside the coupling!



5.1.5 Angular deflection

NORMA**CONNECT**® pipe couplings angular deflection of pipes of up to 2° (4°) in any direction.

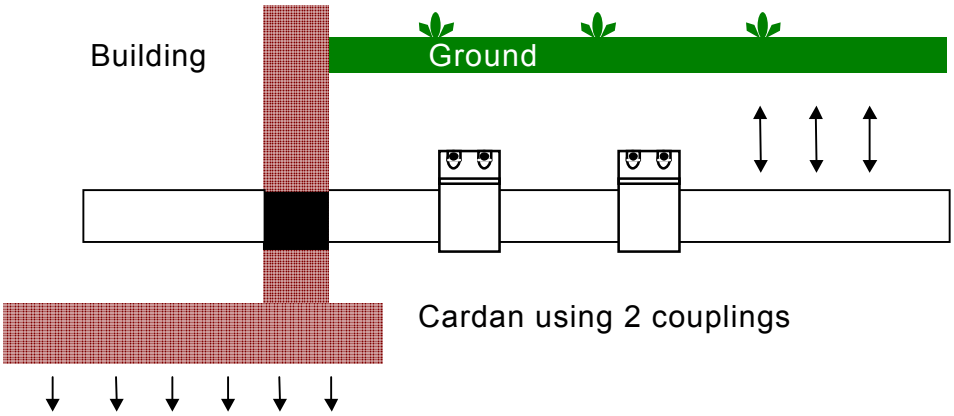


The 2° angular deflection corresponds to 35 mm per meter pipe length.

The installation is very easy and there is no need of costly pipe alignment.

It is possible to fit the pipe with angular deflection and to use the joint for dynamic angular movement, after fitting under working conditions of the pipe system.

Example: Ground settlement

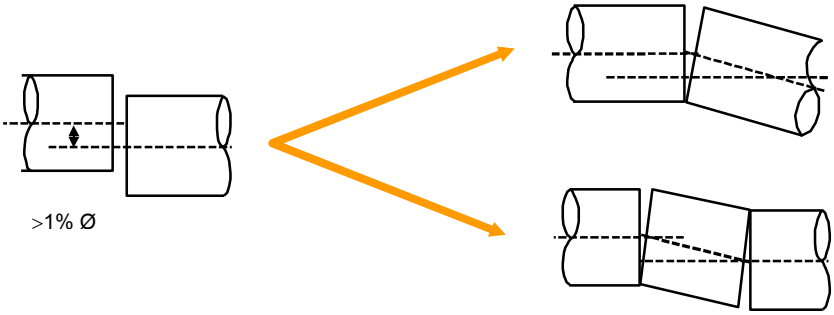


Note: Pipe end gap C_{max} must always be kept.

5.1.6 Axial misalignment

NORMA**CONNECT**® pipe couplings generally allow misalignment of pipe axis.

Our fitting instructions however recommend rectification of possible out-of-line sections with angular deflection or minimization of misalignment to a maximum of 2° or either use an intermediate piece.



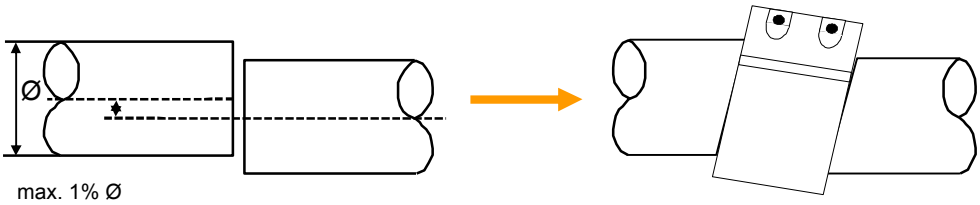
Since a „zero misalignment“ is not practicable, a minimal misalignment is tolerated „de facto“. The following rule of thumb will explain the value of tolerable misalignment; aimed to be kept as small as possible:

‘For fixed pipe ends, a misalignment of up to 1% of corresponding pipe OD can be tolerated without any restrictions. It does not affect the correct fitting of the pipe coupling’.

Where the line guides are sufficiently spaced from pipe ends so that the butt ends of the pipes can be rectified by hand with little force, approx. 500 N, the remaining axial misalignment after tightening the lock bolts is low. In connection with such an application a larger misalignment before fitting the pipe joint can be admitted:

„A misalignment up to 1% in fitted position has no negative influence to the function ability of the NORMACONNECT® series Flex couplings and therefore is tolerable up to pipe OD of 300 mm“.

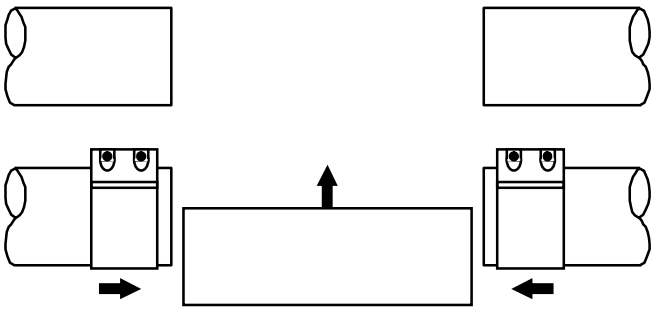
Under such conditions a slight sloping of the coupling on the pipe ends has to be expected.



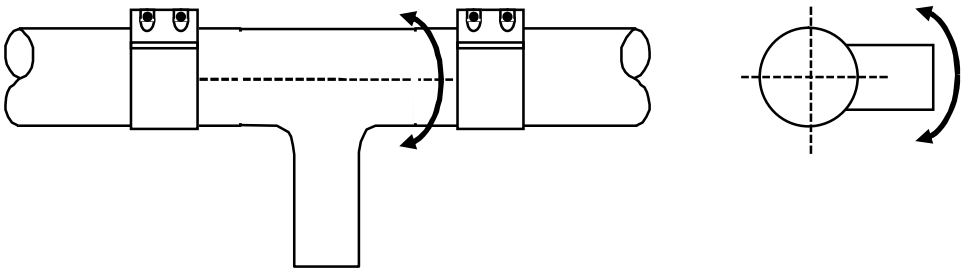
5.1.7 Retro-fitting of pipe sections and fittings

The large scale of clearance and tolerance of NORMA**CONNECT**® pipe couplings make them into an ideal construction element for retro-fitting of pipe sections and fittings during repair work or change of pipeline direction.

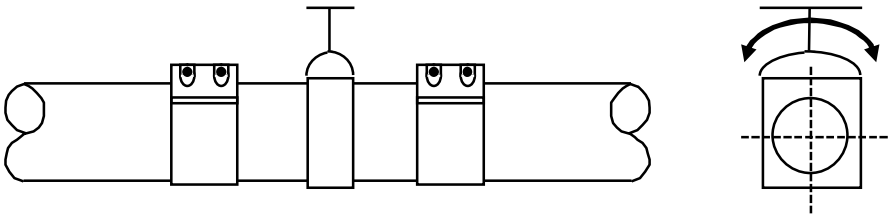
Pipe section for existing or new pipelines



Fitting (T), position and direction of leaving stud to any choice



Valve with plain ends, rotatable to any position



5.2 Assembling of NORMA**CONNECT**® Series Flex and Rep

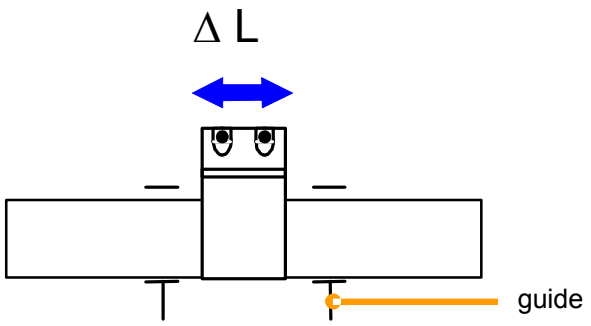
NORMA**CONNECT**® pipe couplings series **Flex**, subdivided into types **Flex** and **Flex E**, enable an **axial non-restraint joint of metal and plastic pipes**. In the same way as the NORMA**CONNECT**® **Rep** series**,** which is merely used for repair purposes. The pipe joint obtained is purely sealing and does not take over axial forces. For each length of pipe fixing points and guidances are necessary.

5.2.1 Axial movement / change in length (Dilatation)

Change of temperature in pipeline systems cause axial movement and tensile or pressure stress which must be compensated by adequate countermeasures.

NORMA**CONNECT**® pipe couplings series **Flex** are able to compensate axial movement of straight pipe sections. According to size of coupling between 5 up to 15 mm.

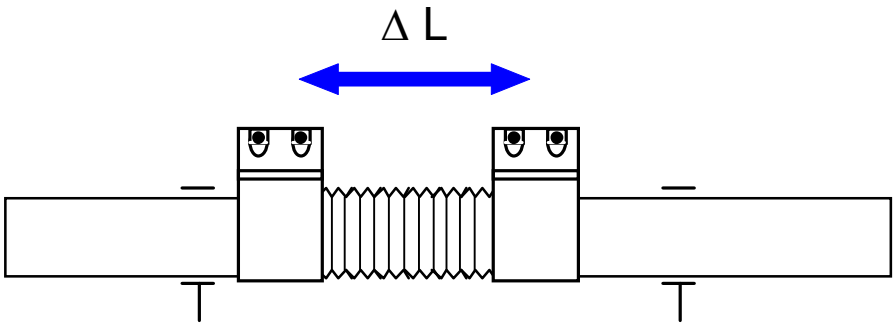
- compensation of axial movement
- no abrasion on the sealing sleeve
- escaping space for rubber expansion under temperature
- stress-free pipeline without additional means (see below)



Note: Pipe end gap C_{max} must always be kept.

Larger axial movements need compensation like:

Traditional compensation

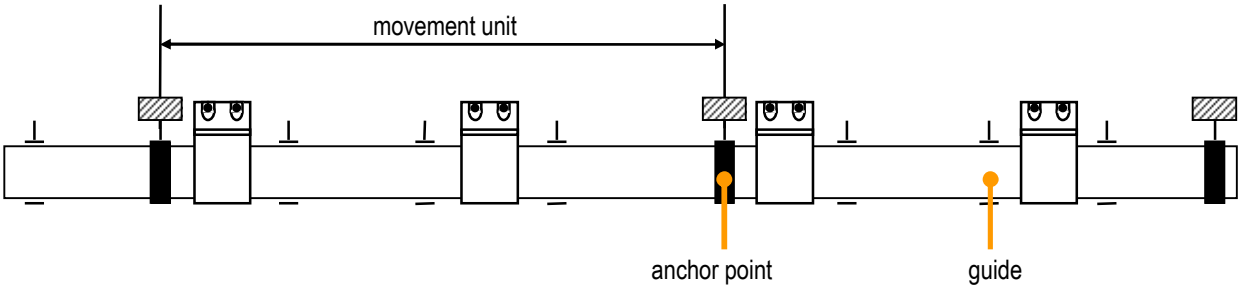


Axial movement / change in length (Dilatation)

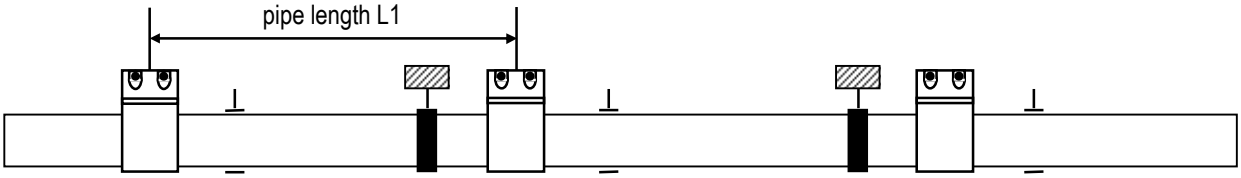
Anchor points and guides with axial movement

Clever fastening of pipe sections which are exposed to axial movement due to temperature influences can be divided into 'movement units' and be joined very economically with **Flex** pipe couplings as compensator.

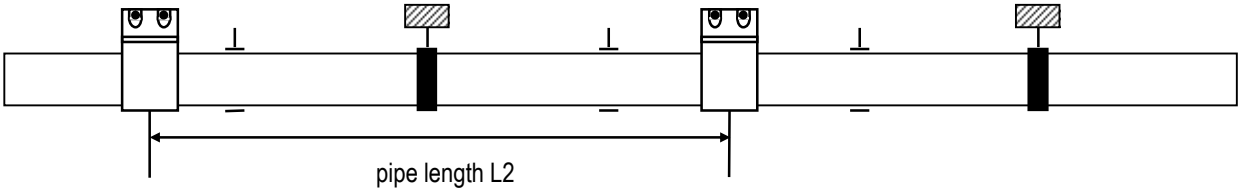
The distance between 2 anchor points forms a movement unit.



The movement between the 2 anchor points shall not exceed the admissible value given for one joint.



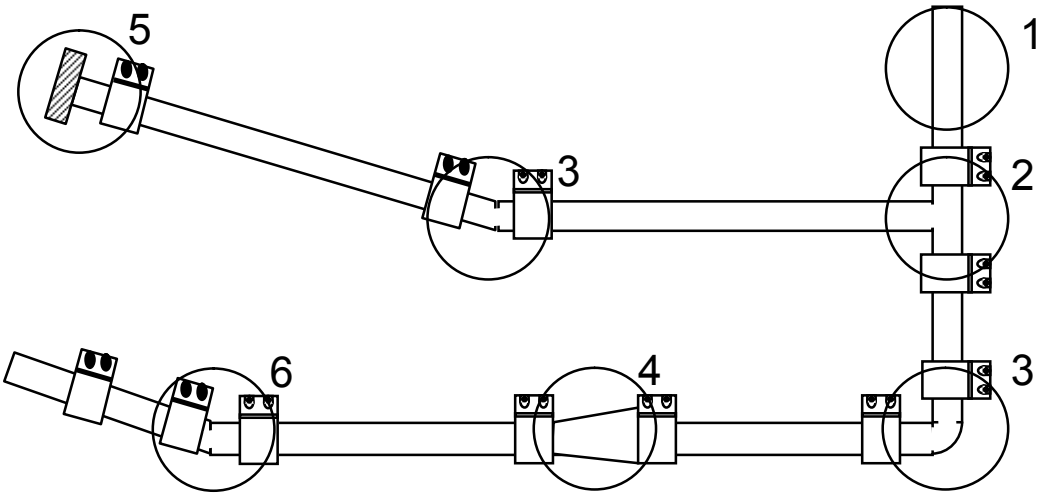
Depending on the value of axial movement every second anchor point can be replaced by a guidance.



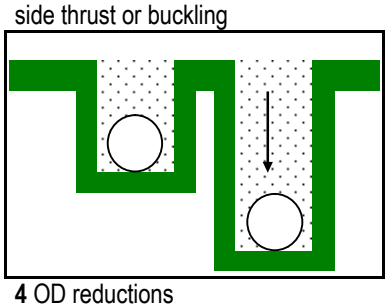
5.2.2 Buried pipelines

NORMA**CONNECT®** **pipe couplings series FLEX do not take over axial forces.**

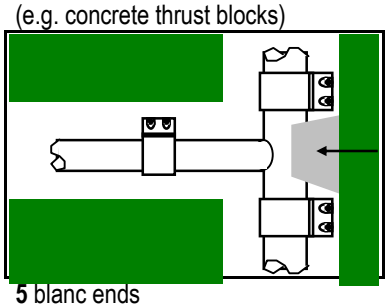
Structural measures for buried pipelines must be taken in order to take up axial forces (e.g. lean concrete abutment)



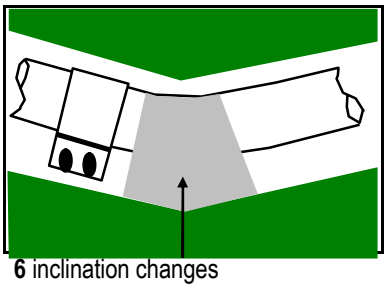
1 sufficient back fill weight to prevent side thrust or buckling



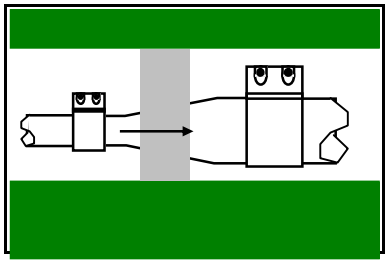
2 Tees (e.g. concrete thrust blocks)



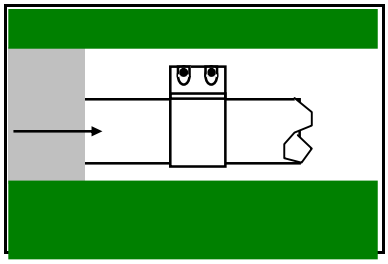
3 bends, direction changes



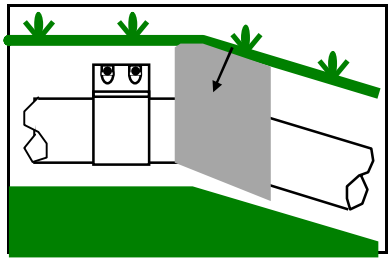
4 OD reductions



5 blanc ends



6 inclination changes



The arrows indicate the counterforce of the abutment.

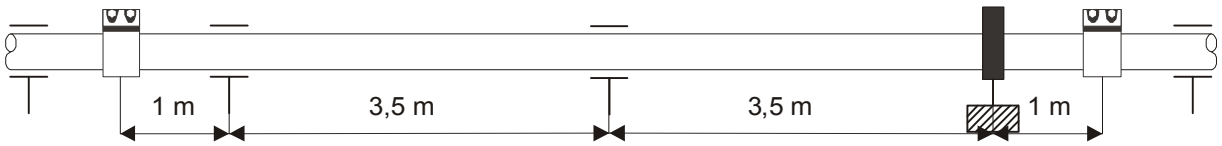
5.2.3 Open layed pipelines

NORMA**CONNECT® pipe couplings series FLEX do not take over axial forces.**

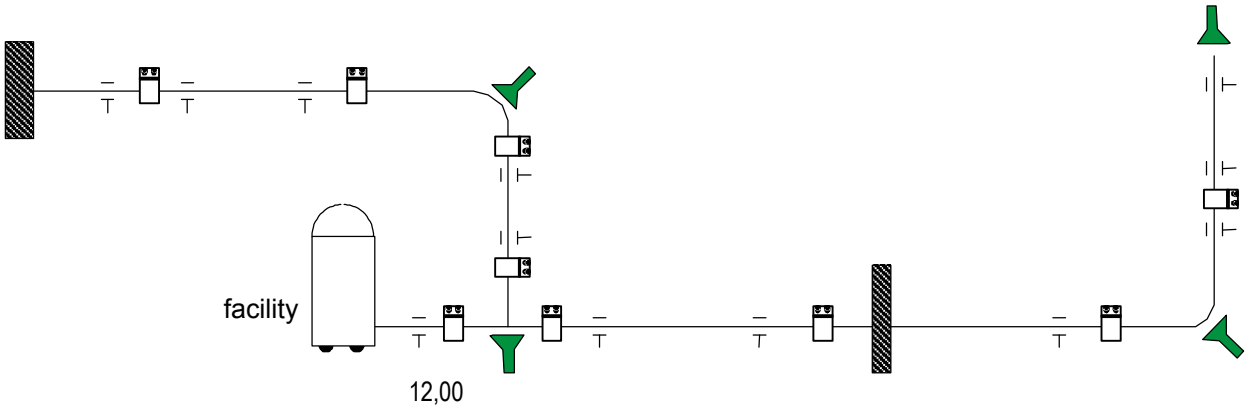
Important: Pressure lines must be supported, anchored and guided. Depending on laying situation supports have to be changed to anchor points.

Thumb rule: One anchor point and one guide per each pipe section!

Structural measures for open layed pipelines – example for a 9m pipe length:



Application example:



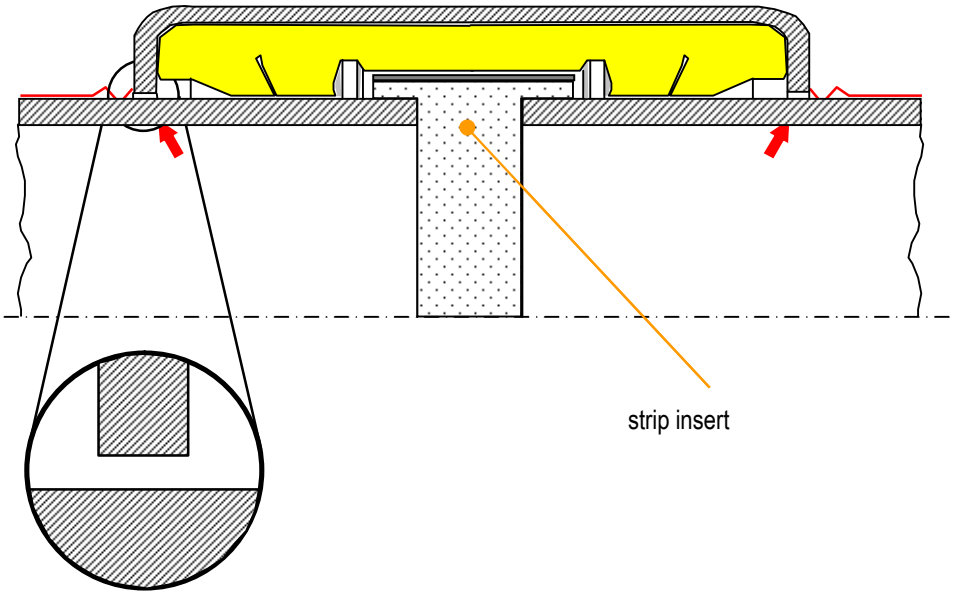
5.2.4 Electrical conductivity

NORMA**CONNECT®** **pipe couplings series FLEX and REP do NOT provide electrical conductivity from pipe to pipe.**

However, they shall not be used as 'insulation piece'. Even under prescribed fitting conditions an electrical contact between the housing of the coupling or the strip insert and the pipe surface can occur.

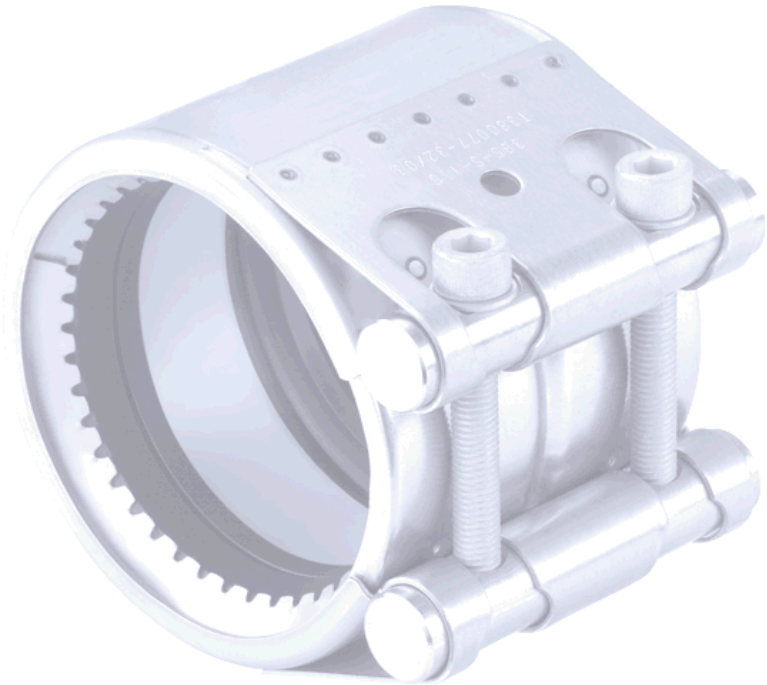
If **electrical conductivity** is required it can be achieved by bridging over the coupling from pipe to pipe with an **earthing strap**.

Is there a positive need to **prevent electrical conductivity** of the pipe joint (insulation), the electrical insulation of the pipeline elements can be achieved by coupling-in a section of plastic pipe of one metre in length with 2 couplings.



5.3 Fitting of NORMA**CONNECT®** Series Grip / CombiGrip E / PlastGrip E

NORMA**CONNECT®** pipe couplings series Grip / CombiGrip E / PlastGrip E, subdivided into types **Grip, Grip E, CombiGrip E, PlastGrip E**,enable an **axial-restraint joint of metal and plastic pipes**.



5.3.1 Installation of vertical pipelines

NORMA**CONNECT**® pipe couplings series **Grip** are the ideal joints to keep plain-ended metal pipe sections in vertical installations perfectly tight and axially restrained.

In the extrem case of a free hanging pump pressure main the appearing forces for each coupling shall be calculated on the basis of the following values:

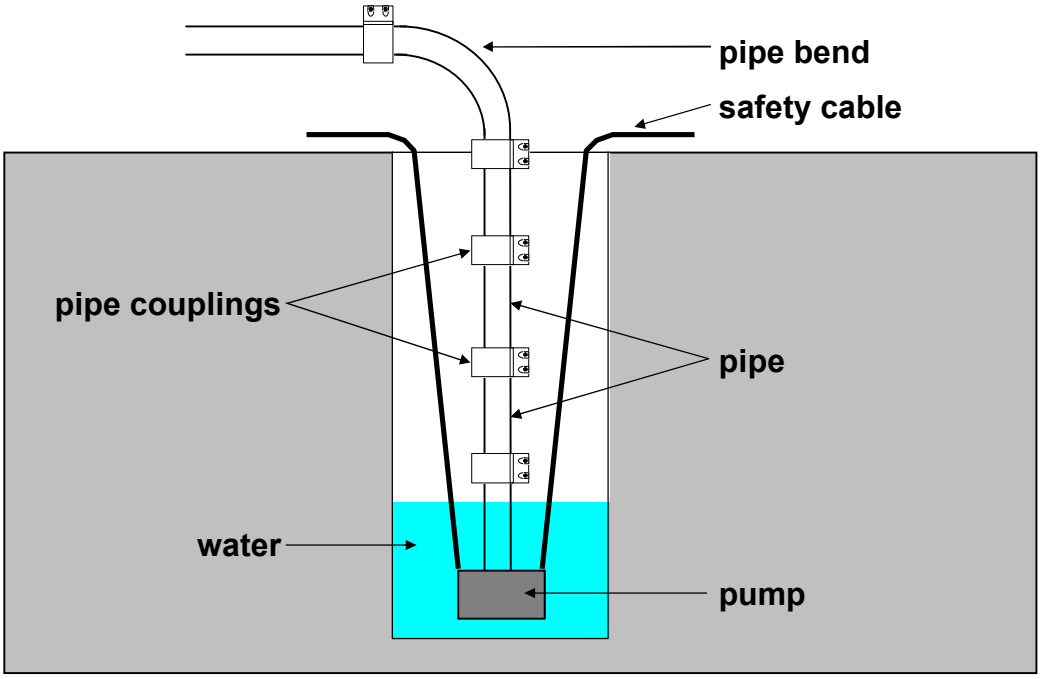
- weight of pipe sections
- weight of couplings (joints)
- weight of pump
- weight of water column in pipes
- force factor resulting from internal pressure and possible pressure surges

Note: The application of NORMA**CONNECT® pipe couplings series CombiGrip E/ PlastGrip E for „installation of vertical pipelines“ is <u>not</u> recommended.**

NORMA**CONNECT**® series **Grip / CombiGrip E / PlastGrip E** pipe couplings apply sufficient resistance against up-coming torsion, resulting from switching on or off the pump (please ask pump manufacturer for details).

Application examples

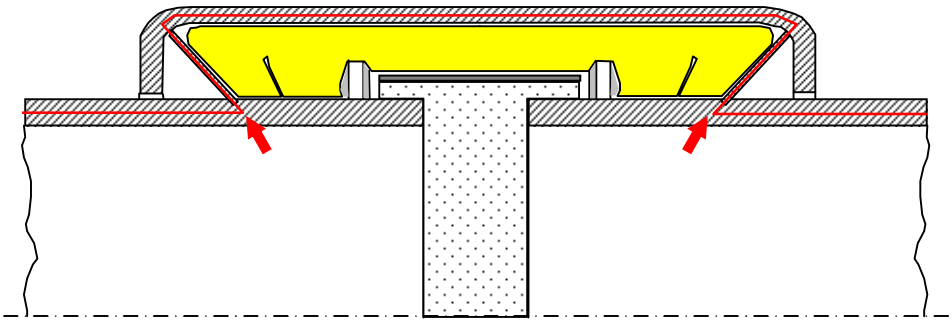
- drilling hole pump lines
- fresh water pump lines
- heat pumps
- shaft pipelines
- charge and discharge systems of silos, tanks and containers



5.3.2 Electrical conductivity for Grip couplings

NORMA**CONNECT**® pipe couplings of series **Grip** guarantee electrical conductivity by bridging over from pipe to pipe through the metallic anchoring mechanism.

Measurements have proven a sufficiently low electrical transition resistance of NORMA**CONNECT**® pipe couplings series **Grip.**



Electrical conductivity is ensured due to the anchoring rings gripping into the metallic pure surface of the pipe.

Note: Due to the use of plastic pipes, there is no electrical conductivity with NORMA**CONNECT**® pipe couplings series **CombiGrip E / PlastGrip E**.

5.4 Assembling NORMACONNECT® RFP

Step 1
Put the flame protection housing around the FGR coupling

Step 2
Position the flame protection housing over the coupling closure

Step 3
Ensure that the screw heads remain accessible

Step 4
Put the flap through the slot

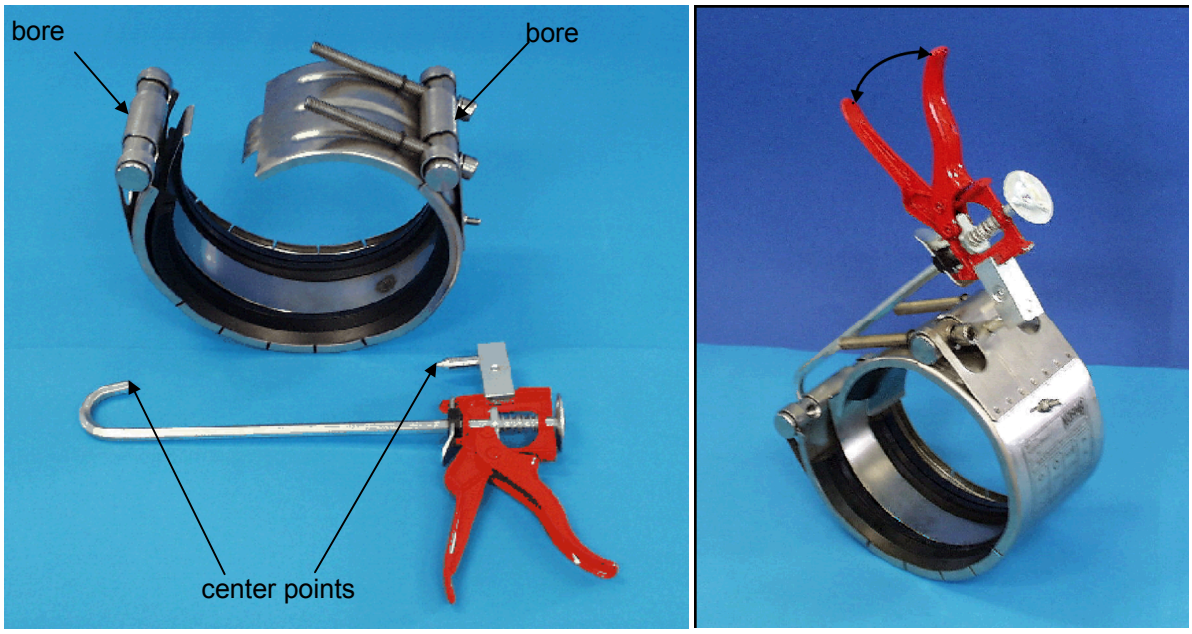
Step 5
Fold the flap over

Step 6
Lock the flap by folding back the lower part – ready !

6. ACCESSORIES

6.1 Fitting pliers for NORMA**CONNECT**® pipe coupling type Rep E

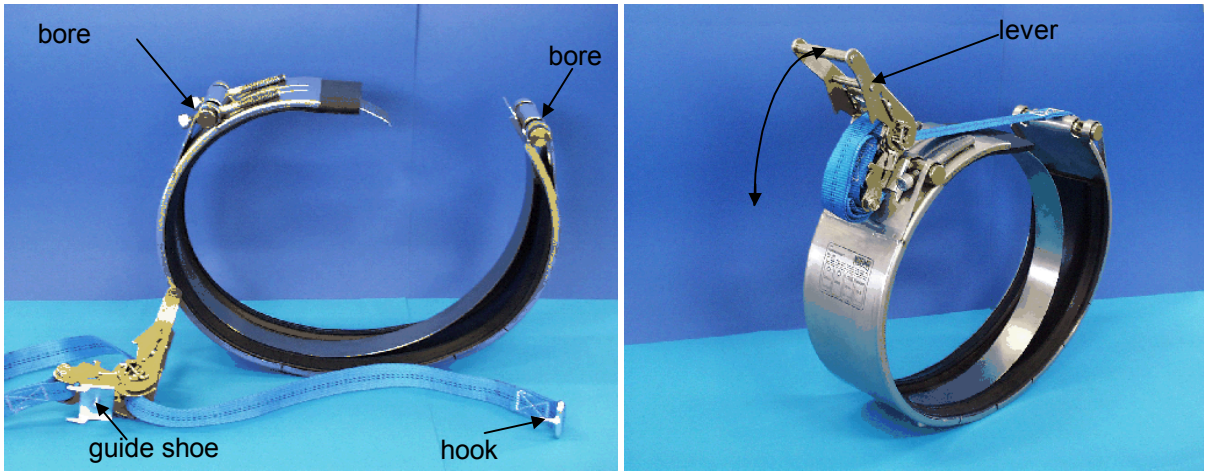
In order to assemble NORMA**CONNECT**® type **Rep E smaller diameter** couplings, the coupling is mounted on the damaged area with the fitting tongs following the fitting instructions.
The two center points of the fitting tongs are introduced into the provided bores of the repair coupling. By pressing the handles, the lock of the coupling is closed, and the bolts can be screwed in manually.



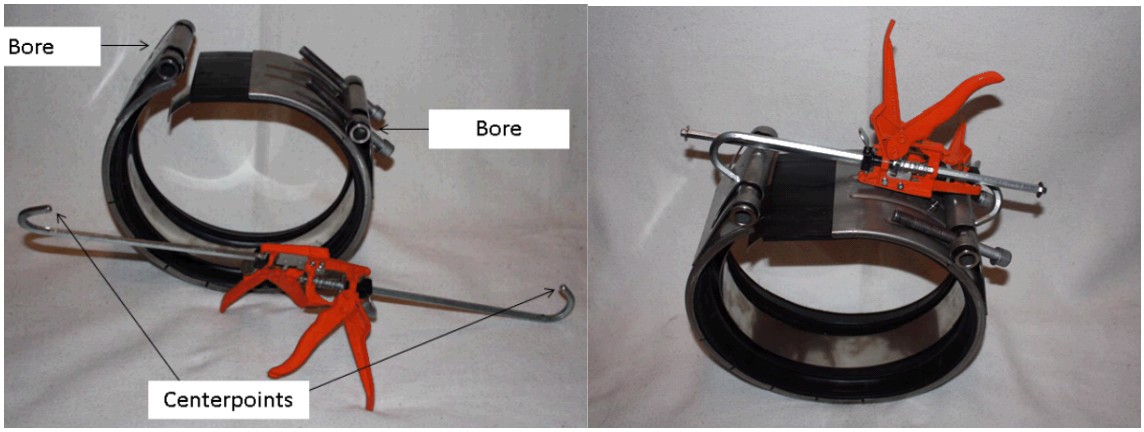
Fitting pliers
for NORMA**CONNECT**® type **Rep E** Ø 35 – 300 mm

6.2 Fitting belt and double-tong for NORMA**CONNECT**® pipe coupling type Rep E

In order to assemble NORMA**CONNECT**® type **Rep E larger diameter** pipe couplings, the coupling is mounted on the damaged area with the fitting belt following the fitting instructions.
The guide shoe of the Fitting belt is first introduced into the bore on the bolt side, then the hook is introduced into the opposite bore. By actuating the lever, the lock of the coupling is closed, and the bolts can be screwed in manually.



Fitting belt
for NORMA**CONNECT**® type **Rep E** Ø >300 - 1220 mm



Fitting double-tong
for NORMA**CONNECT**® type **Rep E** Ø >300 - 1220 mm

6.3 NORMA**CONNECT®** support sleeve for plastic pipes

For the joining of plastic pipes we generally recommend to use our NORMA**CONNECT®** support sleeve. In case of soft thermoplastic materials (as for instance PE) the use of the NORMA**CONNECT®** support sleeve is mandatory.

The NORMA**CONNECT®** support sleeve reinforces the plastic pipe against the pressure exerted by the coupling on the pipe surface and reliably prevents it from deformation, thus ensuring a perfectly sealed joint with NORMA**CONNECT®** pipe couplings.

The NORMA**CONNECT®** support sleeve is inserted into the plastic pipe within the connection area.

Special features of plastic pipes

General:

- The resistance of plastic pipes against chemical substances is extremely high and thus offers to the user a wide range of applications. Still, the material characteristics of the pipes to be connected must be taken into consideration since the type of pipe material will influence the extent of thermal expansion and/or the deformation to be expected.

- Compared to steel the thermal expansion coefficient of plastic material is much higher. This fact must be taken into consideration for the installation of plastic pipes.

- Soft thermoplastics as for example polyethylene (PE) or polypropylene (PP) show a tendency to flow (cold flow). This tendency is increased by such parameters as pressure, temperature and time. Other types of plastics as for example polyvinyl chloride (PVC) or glass fiber reinforced plastic materials are less affected by this phenomenon.

I. Axial linear expansion

Under the influence of low or high temperatures, respectively, plastic pipes change in length, i.e. they will expand under high temperature (expansion) and shrink under the influence of low temperature (contraction). For the specific linear expansion / contraction features please contact the pipe manufacturer (our example is based on 0.2 mm per °C and lenght of pipe in 1 m steps).

Example: Taken a polyethylene pipe of 6 m length and an increase in temperature by 20°C the total expansion is +24 mm.

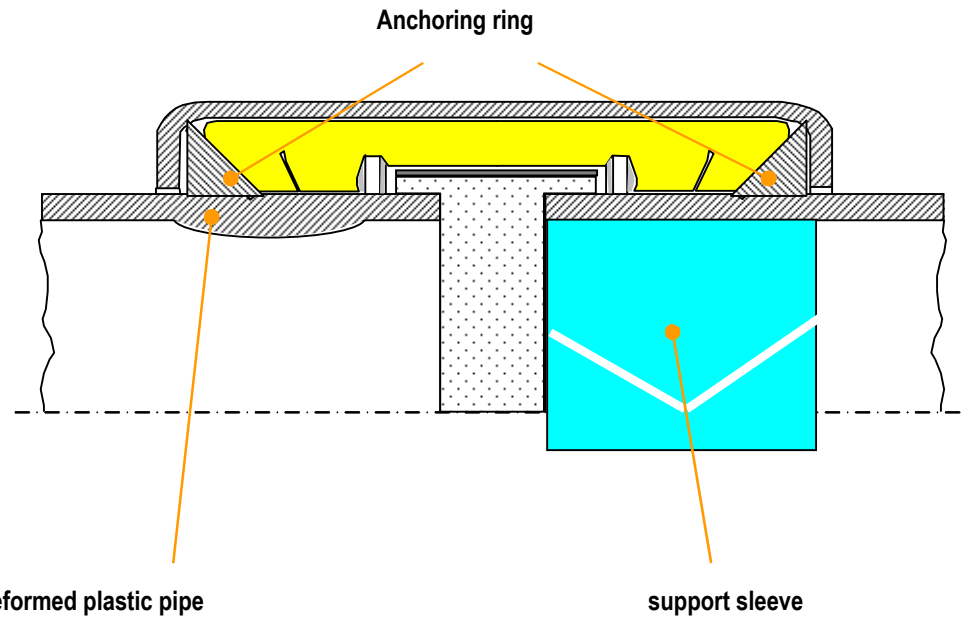
II. Flow under radial pressure

Plastic pipes made of PE or PP (PVC is less affected) will flow under the influence of pressure.

When the locking bolt is tightened to the set torque a corresponding pressure is acting onto the pipe surface. In order to counteract the flowing tendency of the plastic material the force acting on the pipe surface must be distributed over the pipe.

This is especially important for strain-relieved plastic pipes connected by means of NORMA**CONNECT® pipe couplings Type CombiGrip E / PlastGrip E.**

NORMA**CONNECT**® support sleeves are used in order to counteract the pressure load and thus prevent the flowing of the plastic material and shrinking of pipe ends.



III. Thermal conductivity

The thermal conductivity of plastic pipes is very low and the loss of heat as compared to metal pipes is less significant.

Note: The generally low thermal conductivity of plastic pipes must not be mixed up with the thermal conductivity quotient which is rather high (cf. item I).

IV. Shrinking of pipe ends

When a plastic pipe (PE or PP) is cut to a certain length the ends have a tendency to shrink. In order to prevent this kind of reaction it is necessary to insert a NORMA**CONNECT**® support sleeve into the pipe ends immediately after cutting.

Pipe end without support sleeve

Pipe end with support sleeve

Note: In case of soft thermoplastic materials (as for instance PE) the use of the NORMA**CONNECT**® support sleeve is mandatory.

6.3.1 Technical data of the NORMA**CONNECT®** support sleeve

For the joining of plastic pipes we generally recommend to use our NORMA**CONNECT®** support sleeve. In case of soft thermoplastic materials (as for instance PE) the use of the NORMA**CONNECT®** support sleeve is mandatory.

The NORMA**CONNECT®** support sleeve is inserted into the plastic pipe within the connection area (joint) thus providing a secure protection against deformation and exerting sufficient counterforce against the indenting of the anchoring ring.

As a standard feature the NORMA**CONNECT® support sleeve is protected against displacement; in addition, it is marked with the inner diameter of the pipe and an arrow indicating the fitting direction.**

The NORMA**CONNECT®** support sleeve is available in W5 material quality and brass material for shipbuilding applications.

6.3.2 Fitting of the NORMA**CONNECT**® support sleeve

It should be kept in mind that the NORMA**CONNECT**® support sleeve should be best fitted immediately after cutting the plastic pipes.

- Compress NORMA**CONNECT**® support sleeve.
- Insert into the plastic pipe as indicated by the arrow (Fig. 1)

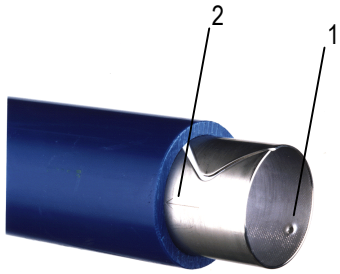


Fig. 1

- Drive in using a hammer (Fig. 2)

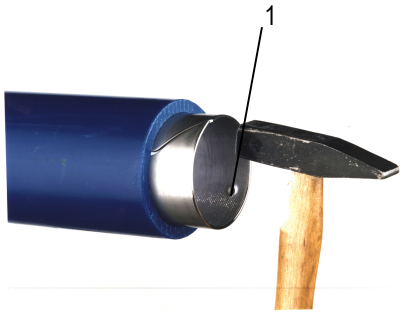


Fig. 2

- Drive in completely until the NORMA**CONNECT**® support sleeve is flush with the end of the pipe section. (Fig. 3)

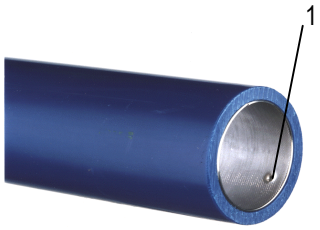


Fig. 3

1) Protection against displacement
2) Arrow indicating direction

7. APPROVALS

NORMA**CONNECT**® pipe couplings are designed in accordance with the requirements of DIN 86128-1 and DIN 86128-2..

For NORMA**CONNECT® pipe couplings we have obtained the following approvals:**

Shipbuilding	FLEX / FLEX E		GRIP / GRIP E		CombiGrip / CombiGrip E	PlastGrip PlastGrip E	Rep E
	26-9 –170 mm	> 170 mm	26-9 –170 mm	> 170 mm			
ABS	●	●	●	●	●	●	
BV	●	●	●	●			
DNV	●	●	●	●			
GL	●	●	●	●			
LRS	●	●	●	●	●	●	
CLASS NK	●	●	●	●	●	●	
RINA	●	1)	●	●			
RMRS	●	●	●	●	●	●	
PRS	●	●	●	●			
KRS	●	●	●	●	●	●	
Water supply & treatment							
KTW	●		●	●	●	●	●
DVGW						●	
SVGW	●	●	●	●	2)	2)	●
SKZ						●	
NSF	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM
DGS	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM
Gas							
DVGW / GWI			●		●	●	
SVGW			●		●	●	
BMFP			●				
Customer approvals							
VW	●	●	●	●	●	●	●
AUDI	●	●	●	●	●	●	●
BMW	NBR	NBR	NBR	NBR	NBR	NBR	NBR
DB	●	●	●	●	●	●	
Blohm & Voss			●	3)			

Special approvals	FLEX / FLEX E		GRIP / GRIP E		CombiGrip / CombiGrip E	PlastGrip / PlastGrip E	Rep E
	26-9 –170 mm	> 170 mm	26-9 –170 mm	> 170 mm			
STS 055			●				
Statens Räddningsverk			●				
SEV			●	3)			
Dürr	●						
CE conformity	●	●	●	●	●	●	●
VdS			●				
DiBT / TÜV south.Germ.			●				
SCES			3)	3)			
BWB			●	3)			
Rapier / FDA	●		●		●	●	

Notes:
1) only type FLEX
2) also COMBIGRIP E and PLASTGRIP E up to 170 mm
3) only type GRIP
4) only type GRIP E

For current approval documents, please contact:

NORMA Germany GmbH, Edisonstr. 4, D-63477 Maintal / Germany,
Mr. Heiko Foering,
Phone: +49 212 226 29 700
Fax: +49 6181 40 31 331
email: heiko.foering@normagroup.com
Homeoffice:
Untere Benrather Str. 21
D-42697 Solingen
Germany

8. HOW TO CHOOSE THE RIGHT COUPLING (PROJECT REQUEST)

We will be pleased to assist you with any advice necessary when choosing the NORMA**CONNECT**® pipe coupling suitable for your purposes.

To give us an idea of your needs and in order to be able to submit an offer we ask you to provide the following information:

Criteria	**Example**
Employed pipe materials acc. DIN / AISI	ST 37 / 304
Strength of the pipe materials to be joined	370 N/mm² / 550 N/mm²
Pipe outside diameter(s) (OD)	88,9 mm / 88,9 mm
Wall thickness(ses)	3,2 mm / 2,5 mm
Working pressure	16 bar
Test pressure	24 bar
Connecting technique used up to now	flange joints
Medium conveyed in the projected pipe system	water
Working temperature of medium in °C, min./max.	min. 15°C / max. 75°C
Surrounding medium	air
Surrounding temperature	ambient (approx. 25°C)
Pipe laying (open, in shaft, buried)	open
Type approval desired	KTW
Estimated quantity of joints	12 pieces

For this example we would suggest to choose the NORMA**CONNECT**® pipe coupling type **GRIP** with material W2 and an EPDM sealing sleeve.

An example fax form for your personal enquiry is provided on next page.

Do you already know which type of coupling you need?

Please specify:

	Example
1. Type (Grip, ...)	Grip
2. Material (W2, W4, W5)	W2
3. Outside diameter of pipe (OD)	88.9
4. Sealing material (EPDM / NBR)	EPDM

Please post this form to our address or fax it to our Info-Line. Thank you!

To
NORMA Germany GmbH
Sales Industry & Trade
Edisonstraße 4
D-63477 Maintal / Germany

Infoline:
Fax: 0 61 81 - 40 32 10

From:

Do not forget your phone No.!

PROJECT REQUEST

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Criteria	
employed pipe materials acc. DIN / AISI	
Strength of the pipe materials to be joined	
Pipe outside diameters (OD)	
Wall thicknesses	
Working pressure	
Test pressure	
connecting technique used up to now	
Medium to be conveyed	
Temperature of medium in °C, min./max	
Surrounding medium	
Surrounding temperature	
Pipe laying (open, in shaft, buried)	
Type approval desired	
Estimated quantity of joints	

(To be completed by the manufacturer:)

☐ **Accepted** **Type of coupling recommended:**

☐ **Not accepted** **Reasons:**

PROJECT REQUEST

Sketch of fitting dimensions or special conditions of use:

Place: Date:

checked by:

NORMA Germany GmbH