

# Bondstrand® Series 2000M and 7000M

fitted with Double O-Ring  
expansion couplings

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### Characteristics

The Double O-Ring expansion coupling is developed to be used in Quick-Lock® and Taper adhesive bonded pipe systems subject to expansion.

Double O-Ring expansion couplings are used on board ships to replace conventional steel mechanical couplings. Double O-Ring expansion couplings do not require corrosion protection or maintenance.

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### Description

The Double O-Ring expansion coupling allows a maximum longitudinal movement of 50 mm. The expansion coupling is configured with female ends for easy, non adhesive, mechanical joining. Prior to application, please ensure suitability of the expansion coupling with respect to working pressure of the pipe system as well as compatibility with service conditions, e.g. the compatibility of the elastomeric O-ring.

Key-Lock O-rings are available in:

- Nitrile Butadiene Rubber (NBR).
- Ethylene Propylene Rubber (EPDM).

Please refer to the Bondstrand® Corrosion Guide for resistance of joint to chemical media.

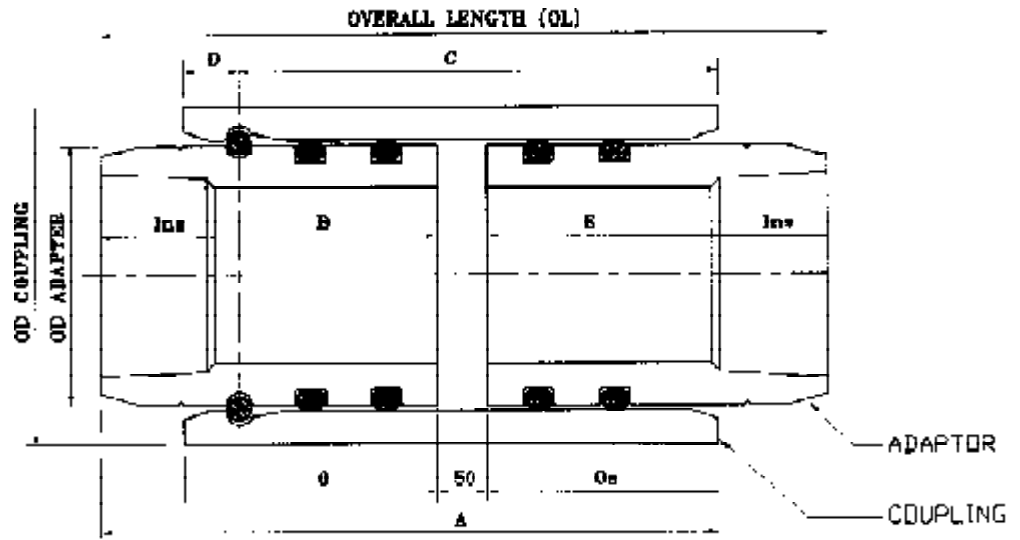
Mechanical joining of this restraint connection is performed by inserting the nylon locking keys. Complete description for assembly of mechanical joints is described in the Bondstrand® Key-Lock Assembly Instructions. Installation of Double O-ring bell and spigot and Double O-ring expansion coupling is outlined in this bulletin.

Joining of Quick-Lock® female ends of the adaptor to the pipe or fittings is described in the Bondstrand® Quick-Lock® Assembly Instructions.  
Joining of Taper female ends of the adaptor to the pipe or fittings is described in the Bondstrand® Taper Assembly Instructions.

For details, please refer to the following Ameron literature:

FP 132	- Bondstrand® Corrosion Guide
FP 161	- Key-Lock Assembly Instructions
FP 170	- Quick-Lock® Assembly Instructions
FP 564	- Taper Assembly Instructions.

# 1. Double O-Ring Expansion Coupling 2000M / 7000M



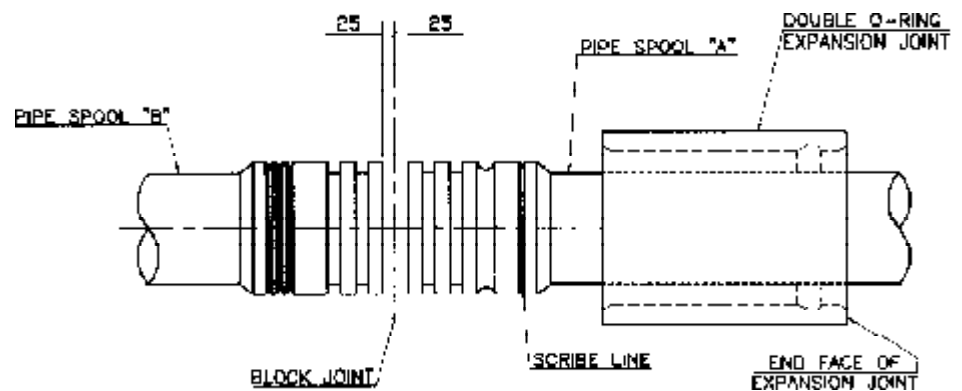
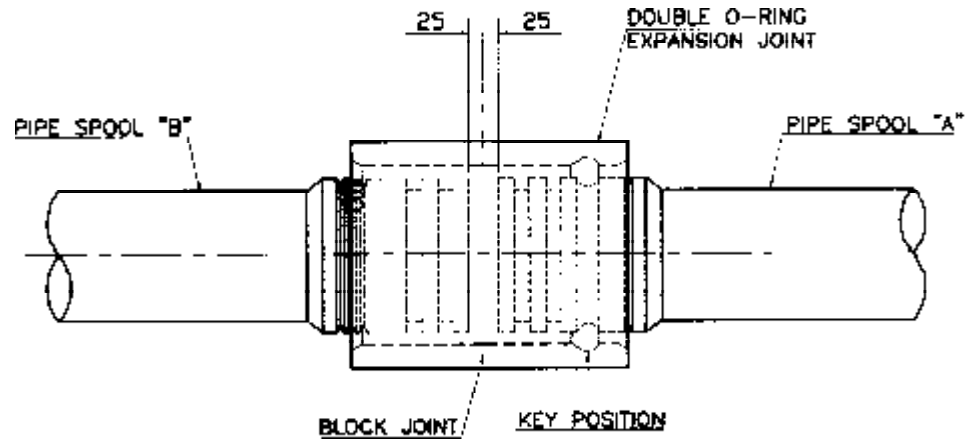
Maximum operating temperature : 93°C  
 Available diameters : 2-16"  
 Maximum pressure : 16 bar

Pipe Dia		A	B	C	D	E	O	Os	Ins
(in)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
2	50	222	85	202	20	85	91	81	46
3	75	222	85	202	20	85	91	81	46
4	100	222	85	202	20	85	91	81	46
5	125	264	102	240.5	23.5	102	112	102	57
6	150	270	105	243	27	105	115	105	57
8	200	337	138	300.5	36.5	138	149	138	64
10	250	356	148	316.5	39.5	148	158	148	70
12	300	410	175	364	46	175	185	175	76
14	350	430	185	381	49	185	195	185	89
16	400	450	195	397.5	52.5	195	205	195	102

Pipe Dia	OD Cplg	OD Adpt	OD ring	Key	OL
(in)	(mm)	(mm)	(mm)	(mm)	(mm)
2	50	98	73.8-74.1	7x59.7	6x305
3	75	127	102.7-103	7x88.3	6x400
4	100	167	128.6-128.9	7x113.7	6x483
5	125	195	158.3-158.6	9x135	8x580
6	160	226	183-183.3	10x161.1	8x660
8	200	309	250.1-250.4	10x225.0	10x840
10	250	386	329.8-330.1	12.5x302.0	12x1270
12	300	422	375.6-375.9	12.5x342.3	15x1270
14	350	435	384.9-385.2	12.5x342.3	15x1360
16	400	489	432.9-433.2	12.5x393.1	18x1585

## Installation Procedure Double O-Ring Expansion Coupling

- 1) Apply lubricant recommended by Ameron on the entire internal surface of the double O-ring expansion coupling.
- 2) Slip the double O-ring expansion coupling into pipespool A. (See sketch below). Ensure that the key groove on the expansion coupling is orientated in the correct position.
- 3) Install pipe spool A & B into correct position and check alignment.



- 4) After the alignment check, put the O-ring into the grooves on the pipe male ends, and install the expansion joint into position. (Expansion coupling is in position when the end face of the expansion coupling is in line with the centre scribe line)

It is recommended that lubricant be applied on the surface of both pipe ends prior to installing the expansion coupling into position.

- 5) Lubricate the locking key (supplied by Ameron) before insertion place the lubricated locking key into the key-hole and drive the locking key hole.

## Dismantling of the expansion coupling and replacement of O-rings

### *For expansion joint:*

- 1) Pull out the locking key from the coupling joint using a hand gripper. You may require to slip the sleeve forward or aft slightly to align the key grooves in order to allow for easy removal of the locking key.
- 2) After removing locking key, push the coupling out of the male end joint. If manual removal of the sleeve is not possible, then the band clamp with mechanical hand puller may be used to assist in pulling the coupling out.

## Dismantling of the expansion coupling and replacement of O-rings ... Cnt'd

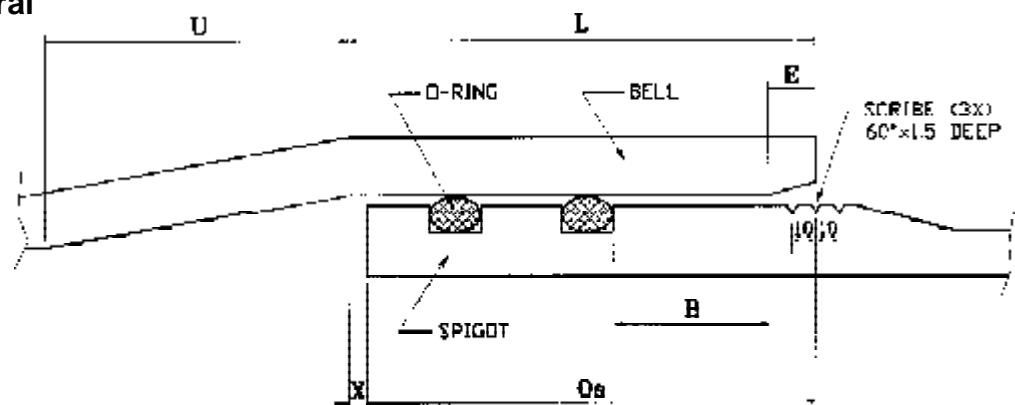
### For Bell & Spigot Joint:

- 1) Pull the male end out of the female end with the use of mechanical hand puller (Band clamps will be required).

### For O-Rings:

- 1) After withdrawing the coupling from the O-ring male end, lift and remove the old O-rings from the groove by using a screwdriver.
- 2) Internal parts of sleeve and O-rings groove should be cleaned with rags in order to eliminate dirt, dust or foreign objects.
- 3) Both the couplings and O-ring grooves should be examined in order to make sure that there are no damages, scratches or cracks.
- 4) Internal part of coupling and groove of male end pipe must then be greased with vynoleo, grease or equivalent.
- 5) Check new O-rings before fitting:
  - a. check for the right size of O-rings
  - b. check for the correctness of rubber material.
  - c. check for any damages on the rubber (cuts, scratches, air bubbles etc.)
 Never use damaged or defective O-rings.
- 6) Lubricate the new O-rings with vynoleo grease and fit the O-rings into the grooves. When slipping the O-rings into groove on male end, ensure that the O-rings are not twisted.
- 7) Install the joint (both the double O-ring bell & spigot and expansion coupling joint) as per Assembly procedure outlined in this bulletin.

## 2. Double O-Ring Integral Joint (bell & spigot)



Pipe Dia	E	Os	X	L	B	O-ring	U	
(in)	(mm)	(mm)	(mm)	(mm)	(mm)			
2	50	10	81	23	104	24	7x59.7	52
3	75	10	81	23	104	24	7x88.3	53
4	100	10	81	23	104	24	7x113.7	60
5	125	10	102	23	125	27	9x135	76
6	160	13	105	23	128	30	10x161.3	62
8	200	13	138	24	162	52	10x225.0	110
10	250	16	148	24	172	56	12.5x302.0	185
12	300	16	175	24	199	70	12.5x342.3	170
14	350	16	185	23.5	209	76	12.5x342.3	109
16	400	16	195	24.5	220	82	12.5x393.1	106
18	450	16	178	27	205	70	15x445	129
20	500	16	186	27	213	75	15x490	122
22	550	18	210	33	243	86	18x556	190
24	600	19	209	27	236	85	18x580	147

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## Installation Procedure Bell & Spigot

### Preparation of joining surfaces

When ready to join the pipe, remove the dirt and debris from the grooves using compressed air, a clean dry rag or a paint brush.

Clean the grooves and sealing surface of the female end or coupling. Sand off any projections or rough edges on the entry ramps which compresses the O-ring during insertion.

Now brush or rub a layer of Vynoleo grease into the O-ring groove of the male end and all inside surfaces of the female end or coupling. **Apply lubricant only when you are ready to complete the joint.** Keep lubricated surfaces clean and free of sand and dirt as contamination is likely to interfere with joining and sealing. Proper lubrication of the O-ring and joint surfaces is important to avoid cutting the O-ring or rolling it out of place during assembly.

**O-ring placement:** Lubricate entire surface of the O-ring and slip it into the both groove on the male end. Distribute the O-ring evenly in the groove by slipping a screwdriver under it and sliding the screwdriver around the joint. As an alternative for distributing the O-ring in pipe in sizes through 16 inches (400 mm), use a screwdriver to lift the lubricated O-ring at top center a distance of about 20 percent of the pipe diameter and let it snap back into the groove.

**Do not gouge or abrade the O-ring. A sound O-ring is the key to a watertight joint.**

### Procedure

- 1) Lubricate inside surface of bell end and with ample amounts of lubricant (available on order from Ameron).
- 2) The spigot end of the pipe going in should also be generously lubricated.
- 3) After coating the O-ring (supplied by Ameron) with lubricant, mount it in the groove in the spigot end. Insert a screwdriver under the mounted O-ring and run it around the pipe to distribute the O-ring in the groove.
- 4) Mount the band clamps (available on order from Ameron) a convenient distance on each side of the joint, making certain that the pipe going in is properly positioned.
- 5) Align the pipe for a straight concentric entry. Proper alignment is essential for joining ease.
- 6) Tighten the come-a-longs on both sides so that the O-ring enters smoothly without being pushed out of its groove.
- 7) Insert the male end until the centre scribe line is align with the leading edge of the bell end.

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**Field testing**

Pipe system is designed for field testing with water at ambient temperature at 125% of rated pressure.

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**Surge pressure**

Maximum allowable surge pressure is 125% of rated pressure at ambient temperature.

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**Conversions**

1 psi	= 6895 Pa	= 0.07031 kg/cm <sup>2</sup>	
1 bar	= 10 <sup>5</sup> Pa	= 14.5 psi	= 1.02 kg/cm <sup>2</sup>
1 MPa	= 1 N/mm <sup>2</sup>	= 145 psi	= 10.2 kg/cm <sup>2</sup>
1 inch		= 25.4 mm	
1 Btu.in/ft <sup>2</sup> h°F		= 0.1442 W/mK	
°C		= 5/9 (°F-32)	

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**Important notice**

This product literature and the recommendations for usage it contains are based on test data reasonably believed to be reliable. It is intended that this literature be used by personnel having specialised training in accordance with currently acceptable industry practice and normal operating conditions. Variation in environment, changes in operating procedures, or extrapolation of data may cause unsatisfactory results. We recommend that your engineers verify the suitability of this product for your intended application. Since we have no control over the conditions of service, we expressly disclaim responsibility for the results obtained or for any consequential or incidental damages of any kind incurred.

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