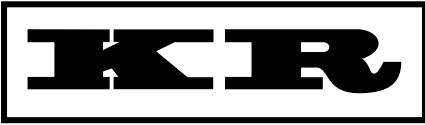


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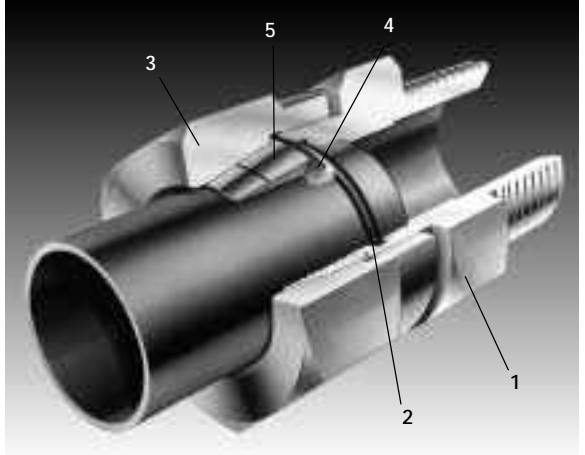
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CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

Benefits

- Leak free - "O" ring seal
- Safe joint every time – low tightening torque and clamping force rises with the internal pressure.
- Low installed cost – no welding (so inert gas purging, NDT and excessive flushing are not required), minimal tube preparation and no special assembly equipment are required.
- Demountable and reusable. Can be used with most tube materials.



Features

1. Body – mild or stainless steel or cupro-nickel, compatible with most fluids and environments. Locates O ring and tube.
2. O-ring – nitrile, FPM (viton), EP or FEP encapsulated FPM, compatible with most fluids, highly resistant to leakage even under severe vibration, pressure pulsation and temperature cycling. Provides diametric seal between tube O/D and body cavity.
3. Nut – mild or stainless steel or cupro-nickel, compatible with most environments. Closes split collet and retains sealing mechanism.
4. Back-up washer – mild or stainless steel or cupro-nickel. Provides additional support for the tube and locates the O-ring.
5. Split collet – mild or stainless steel or cupro-nickel. Clamping force rises with pressure. Large clamping area ensures minimal deformation of the tube. Retains tube in position.

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Metric KR couplings 6 to 50 mm O/DPage 4 to 23

Imperial KR couplings $\frac{1}{4}$ to 2 inch O/DPage 24 to 25

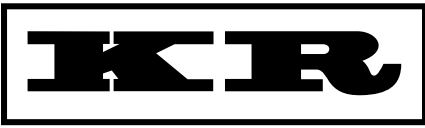
KR couplings over 50mm & 2 inch O/DPage 26 to 28

Threaded Adaptors $\frac{1}{4}$ to 2 inchPage 29 to 44

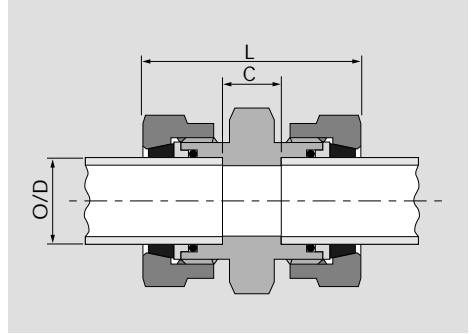
Tube 6 to 125 mm O/DPage 45 to 46

KR Couplings Specifications and assemblyPage 47 to 53

Installation Guidelines, Pressure drop &
Pipe stress Calculations and Conversion Tables . .Page 54 to 59



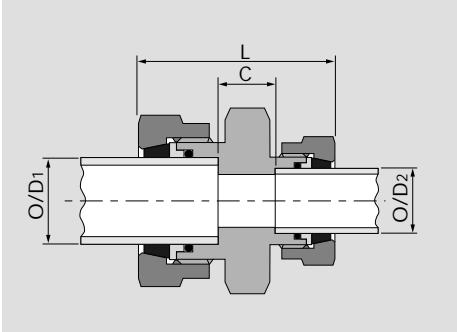
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Straight Coupling

| O/D mm | Part No | Dimensions - mm | | | |
|--------|---------|-----------------|-----|-----|------|
| | | C | L | Nut | Body |
| 6 | AM6CR | 14 | 44 | 16 | 14 |
| 8 | AM8CR | 14 | 44 | 17 | 17 |
| 10 | AM10CR | 10 | 54 | 27 | 27 |
| 12 | AM12CR | 10 | 54 | 27 | 27 |
| 16 | AM16CR | 11 | 57 | 32 | 27 |
| 20 | AM20CR | 13 | 73 | 41 | 36 |
| 22 | AM22CR | 13 | 73 | 41 | 41 |
| 25 | AM25CR | 17 | 76 | 46 | 41 |
| 30 | AM30CR | 22 | 89 | 50 | 46 |
| 38 | AM38CR | 29 | 105 | 60 | 55 |
| 50 | AM50CR | 37 | 137 | 80 | 80 |

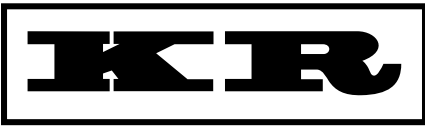
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CUPRO NICKEL



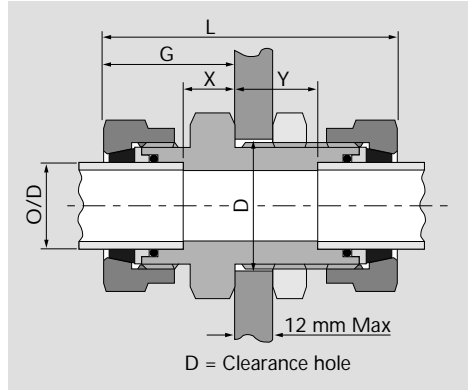
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Straight Reducing Coupling

| O/D mm | | Part No | Dimensions - mm | | Nut | Nut | Body |
|--------|----|------------|-----------------|----|-----|-----|------|
| 1 | 2 | | C | L | 1 | 2 | |
| 8 | 6 | AM8-M6RR | 14 | 44 | 17 | 16 | 17 |
| 10 | 8 | AM10-M8RR | 13 | 50 | 27 | 17 | 27 |
| 10 | 6 | AM10-M6RR | 13 | 50 | 27 | 16 | 27 |
| 12 | 10 | AM12-M10RR | 10 | 54 | 27 | 27 | 27 |
| 12 | 8 | AM12-M8RR | 13 | 50 | 27 | 17 | 27 |
| 16 | 12 | AM16-M12RR | 11 | 57 | 32 | 27 | 27 |
| 16 | 10 | AM16-M10RR | 11 | 57 | 32 | 27 | 27 |
| 16 | 8 | AM16-M8RR | 14 | 52 | 32 | 17 | 27 |
| 20 | 16 | AM20-M16RR | 14 | 67 | 41 | 32 | 36 |
| 20 | 12 | AM20-M12RR | 14 | 66 | 41 | 27 | 36 |
| 20 | 10 | AM20-M10RR | 14 | 66 | 41 | 27 | 36 |
| 25 | 20 | AM25-M20RR | 16 | 77 | 46 | 41 | 41 |
| 25 | 16 | AM25-M16RR | 16 | 68 | 46 | 32 | 41 |
| 25 | 12 | AM25-M12RR | 16 | 69 | 46 | 27 | 41 |
| 30 | 25 | AM30-M25RR | 21 | 84 | 50 | 46 | 46 |
| 30 | 20 | AM30-M20RR | 19 | 83 | 50 | 41 | 46 |
| 38 | 30 | AM38-M30RR | 27 | 98 | 60 | 50 | 55 |
| 38 | 25 | AM38-M25RR | 25 | 93 | 60 | 46 | 55 |



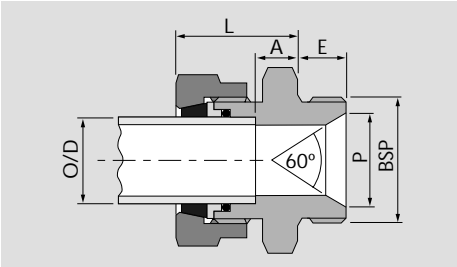
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Straight Bulkhead Coupling

| O/D mm | Part No | Dimensions - mm | | | | | | Nut | Body |
|-----------|----------------|-----------------|-----------|------------|-----------|-----------|-----------|-----------|------|
| | | D | G | L | X | Y | | | |
| 6 | AM6BPR | 14 | 25 | 67 | 10 | 27 | 16 | 17 | |
| 8 | AM8BPR | 16 | 25 | 67 | 10 | 27 | 17 | 17 | |
| 10 | AM10BPR | 24 | 30 | 76 | 8 | 24 | 27 | 27 | |
| 12 | AM12BPR | 24 | 30 | 76 | 8 | 24 | 27 | 27 | |
| 16 | AM16BPR | 27 | 33 | 82 | 10 | 25 | 32 | 32 | |
| 20 | AM20BPR | 37 | 46 | 101 | 16 | 32 | 41 | 41 | |
| 22 | AM22BPR | 37 | 43 | 99 | 13 | 25 | 41 | 41 | |
| 25 | AM25BPR | 40 | 49 | 109 | 18 | 34 | 46 | 41 | |
| 30 | AM30BPR | 46 | 51 | 115 | 18 | 32 | 50 | 50 | |
| 38 | AM38BPR | 52 | 62 | 134 | 23 | 34 | 60 | 60 | |
| 50 | AM50BPR | 71 | 79 | 171 | 29 | 42 | 80 | 80 | |

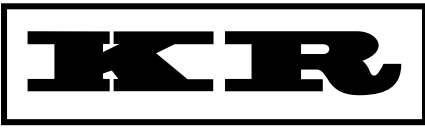
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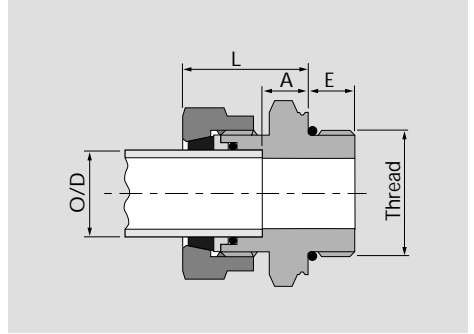
KR Metric

Male Stud Coupling BSP

| O/D mm | Stud BSP | Part No | Dimensions - mm | | | | | |
|-----------|-------------|-------------|-----------------|----|----|----|-----|------|
| | | | A | E | L | P | Nut | Body |
| 6 | 1/4" | AM6-4MSCR | 11 | 11 | 26 | 11 | 16 | 19 |
| 6 | 3/8" | AM6-6MSCR | 13 | 13 | 28 | 14 | 16 | 22 |
| 8 | 1/2" | AM8-2MSCR | 11 | 10 | 26 | 8 | 17 | 17 |
| 8 | 3/4" | AM8-4MSCR | 11 | 11 | 26 | 11 | 17 | 19 |
| 8 | 1" | AM8-6MSCR | 13 | 13 | 28 | 14 | 17 | 22 |
| 10 | 1 1/4" | AM10-4MSCR | 10 | 11 | 32 | 11 | 27 | 27 |
| 10 | 1 1/2" | AM10-6MSCR | 10 | 13 | 32 | 14 | 27 | 27 |
| 10 | 2" | AM10-8MSCR | 10 | 16 | 32 | 18 | 27 | 27 |
| 12 | 2 1/2" | AM12-6MSCR | 10 | 13 | 32 | 14 | 27 | 27 |
| 12 | 3" | AM12-8MSCR | 10 | 16 | 32 | 18 | 27 | 27 |
| 12 | 3 1/2" | AM12-12MSCR | 11 | 19 | 33 | 23 | 27 | 33 |
| 16 | 2" | AM16-6MSCR | 11 | 13 | 34 | 14 | 32 | 27 |
| 16 | 2 1/2" | AM16-8MSCR | 11 | 16 | 34 | 18 | 32 | 27 |
| 16 | 3" | AM16-12MSCR | 13 | 19 | 36 | 23 | 32 | 33 |
| 20 | 2 1/2" | AM20-8MSCR | 11 | 16 | 41 | 18 | 41 | 36 |
| 20 | 3 1/2" | AM20-12MSCR | 11 | 19 | 41 | 23 | 41 | 36 |
| 20 | 1" | AM20-16MSCR | 13 | 21 | 44 | 29 | 41 | 41 |
| 22 | 1 1/2" | AM22-12MSCR | 13 | 19 | 44 | 23 | 41 | 41 |
| 25 | 2" | AM25-12MSCR | 15 | 19 | 46 | 23 | 46 | 41 |
| 25 | 1" | AM25-16MSCR | 15 | 21 | 46 | 29 | 46 | 41 |
| 25 | 1 1/4" | AM25-20MSCR | 18 | 21 | 49 | 37 | 46 | 50 |
| 30 | 1" | AM30-16MSCR | 19 | 21 | 53 | 29 | 50 | 46 |
| 30 | 1 1/4" | AM30-20MSCR | 19 | 21 | 53 | 37 | 50 | 50 |
| 38 | 1" | AM38-16MSCR | 24 | 21 | 62 | 29 | 60 | 55 |
| 38 | 1 1/4" | AM38-20MSCR | 24 | 21 | 62 | 37 | 60 | 55 |
| 38 | 1 1/2" | AM38-24MSCR | 24 | 25 | 62 | 43 | 60 | 60 |
| 50 | 1 1/2" | AM50-20MSCR | 30 | 21 | 80 | 37 | 80 | 80 |
| 50 | 1 1/2" | AM50-24MSCR | 30 | 25 | 81 | 43 | 80 | 80 |
| 50 | 2" | AM50-32MSCR | 30 | 30 | 81 | 55 | 80 | 80 |



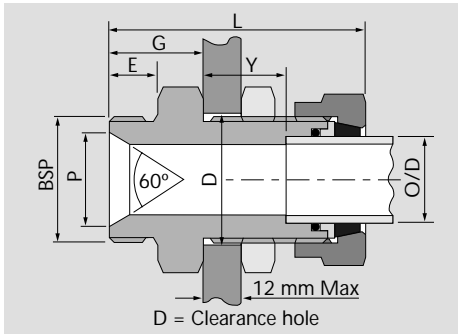
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Male Stud Coupling ISO

| O/D mm | Stud | Part No | Dimensions - mm | | | | |
|-----------|------|---------------|-----------------|------|----|-----|------|
| | | | A | E | L | Nut | Body |
| 6 | M12 | AM6-IM12MSCR | 10 | 11.0 | 26 | 16 | 17 |
| 8 | M14 | AM8-IM14MSCR | 10 | 11.0 | 26 | 17 | 19 |
| 10 | M16 | AM10-IM16MSCR | 9 | 12.5 | 32 | 27 | 27 |
| 12 | M18 | AM12-IM18MSCR | 9 | 14.0 | 32 | 27 | 27 |
| 16 | M22 | AM16-IM22MSCR | 10 | 15.0 | 34 | 32 | 27 |
| 20 | M27 | AM20-IM27MSCR | 13 | 18.5 | 43 | 41 | 36 |
| 25 | M33 | AM25-IM33MSCR | 15 | 18.5 | 46 | 46 | 41 |
| 30 | M42 | AM30-IM42MSCR | 18 | 19.0 | 51 | 50 | 50 |
| 38 | M48 | AM38-IM48MSCR | 23 | 21.5 | 62 | 60 | 55 |
| 50 | M60 | AM50-IM60MSCR | 29 | 24.0 | 79 | 80 | 80 |

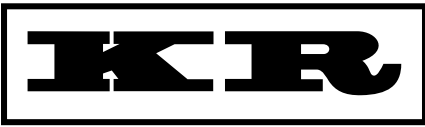
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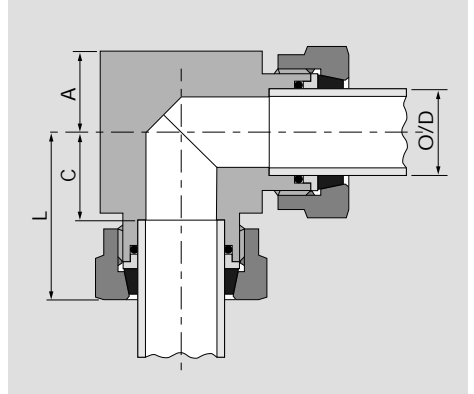
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Male Stud Bulkhead Coupling BSP

| O/D mm | Stud BSP | Part No | Dimensions - mm | | | | | | | |
|-----------|-------------|------------|-----------------|----|----|-----|----|----|-----|------|
| | | | D | E | G | L | Y | P | Nut | Body |
| 6 | 1/4" | AM6-4BHR | 14 | 11 | 18 | 60 | 27 | 11 | 16 | 17 |
| 8 | 1/4" | AM8-4BHR | 16 | 11 | 18 | 61 | 27 | 11 | 17 | 17 |
| 10 | 3/8" | AM10-6BHR | 24 | 13 | 21 | 67 | 24 | 14 | 27 | 27 |
| 12 | 3/8" | AM12-6BHR | 24 | 13 | 21 | 67 | 24 | 14 | 27 | 27 |
| 12 | 1/2" | AM12-8BHR | 27 | 16 | 25 | 74 | 25 | 18 | 27 | 27 |
| 16 | 1/2" | AM16-8BHR | 27 | 16 | 25 | 74 | 25 | 18 | 32 | 32 |
| 20 | 3/4" | AM20-12BHR | 37 | 19 | 31 | 87 | 25 | 23 | 41 | 41 |
| 25 | 1" | AM25-16BHR | 40 | 21 | 33 | 92 | 28 | 29 | 46 | 41 |
| 30 | 1" | AM30-16BHR | 46 | 21 | 35 | 99 | 32 | 29 | 50 | 50 |
| 30 | 1 1/4" | AM30-20BHR | 46 | 21 | 38 | 102 | 32 | 37 | 50 | 50 |
| 38 | 1 1/4" | AM38-20BHR | 52 | 21 | 38 | 110 | 34 | 37 | 60 | 60 |
| 38 | 1 1/2" | AM38-24BHR | 52 | 25 | 48 | 120 | 34 | 43 | 60 | 60 |



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 STAINLESS STEEL
 CUPRO NICKEL



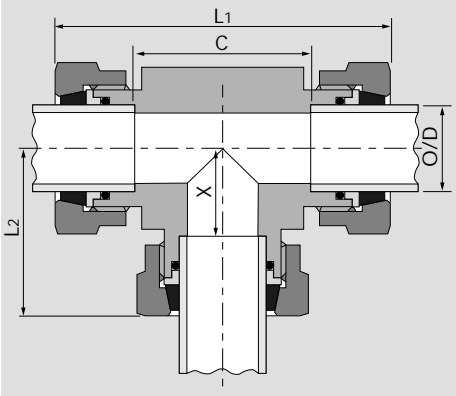
Equal Elbow

| O/D mm | Part No | Dimensions - mm | | | | |
|--------|---------|-----------------|----|----|-----|------|
| | | A | C | L | Nut | Body |
| 6 | AM6ER | 8 | 12 | 27 | 16 | 16 |
| 8 | AM8ER | 10 | 13 | 29 | 17 | 19 |
| 10 | AM10ER | 13 | 13 | 35 | 27 | 27 |
| 12 | AM12ER | 13 | 13 | 35 | 27 | 27 |
| 16 | AM16ER | 16 | 17 | 41 | 32 | 31 |
| 20 | AM20ER | 21 | 21 | 51 | 41 | 39 |
| 22 | AM22ER | 21 | 21 | 52 | 41 | 39 |
| 25 | AM25ER | 20 | 22 | 53 | 46 | 42 |
| 30 | AM30ER | 24 | 29 | 63 | 50 | 48 |
| 38 | AM38ER | 27 | 36 | 74 | 60 | 54 |
| 50 | AM50ER | 38 | 49 | 99 | 80 | 77 |



Swivel Elbows
 Use a combination of
 elbows and Stud Standpipes
 see page 37

CARBON STEEL
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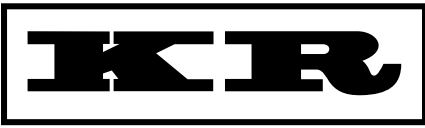
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Equal Tee

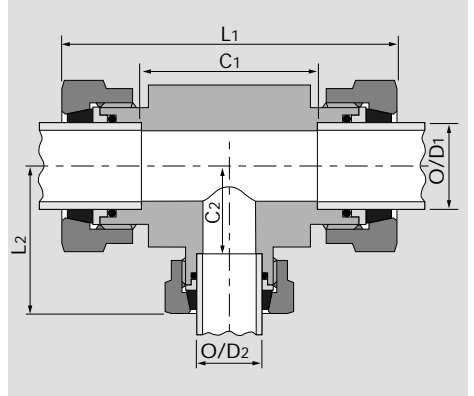
| O/D mm | Part No | Dimensions - mm | | | | | |
|--------|---------|-----------------|-----|----|----|-----|------|
| | | C | L1 | L2 | X | Nut | Body |
| 6 | AM6TR | 24 | 54 | 27 | 12 | 16 | 16 |
| 8 | AM8TR | 27 | 57 | 29 | 14 | 17 | 19 |
| 10 | AM10TR | 27 | 71 | 35 | 14 | 27 | 27 |
| 12 | AM12TR | 27 | 71 | 35 | 14 | 27 | 27 |
| 16 | AM16TR | 33 | 80 | 40 | 17 | 32 | 30 |
| 20 | AM20TR | 43 | 103 | 51 | 21 | 41 | 38 |
| 22 | AM22TR | 43 | 103 | 51 | 21 | 41 | 38 |
| 25 | AM25TR | 44 | 104 | 53 | 22 | 46 | 41 |
| 30 | AM30TR | 59 | 126 | 62 | 29 | 50 | 48 |
| 38 | AM38TR | 71 | 147 | 74 | 36 | 60 | 54 |
| 50 | AM50TR | 98 | 199 | 99 | 49 | 80 | 76 |

Swivel Tees
 Use a combination of
 Tees and Stud Standpipes
 see page 37





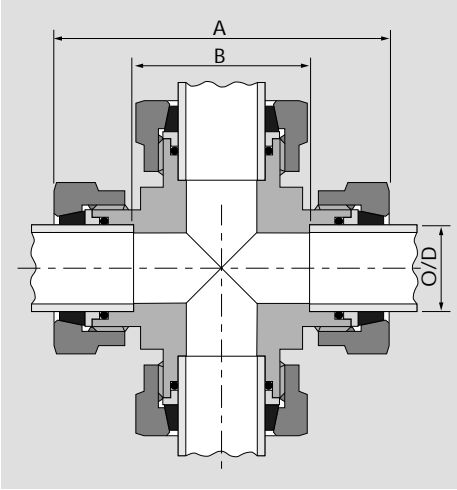
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Reducing Outlet Tee

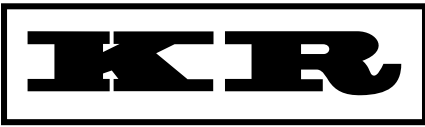
| O/D mm | | Part No | Dimensions - mm | | | | Nut | | Body |
|--------|----|--------------|-----------------|----------------|----------------|----------------|-----|----|------|
| 1 | 2 | | L ₁ | L ₂ | C ₁ | C ₂ | 1 | 2 | |
| 8 | 6 | AM8-M6ROTR | 57 | 29 | 27 | 14 | 17 | 16 | 19 |
| 10 | 6 | AM10-M6ROTR | 71 | 32 | 27 | 17 | 27 | 16 | 27 |
| 12 | 8 | AM12-M8ROTR | 71 | 32 | 27 | 17 | 27 | 17 | 27 |
| 16 | 8 | AM16-M8ROTR | 79 | 39 | 33 | 17 | 32 | 17 | 30 |
| 20 | 8 | AM20-M8ROTR | 103 | 37 | 43 | 22 | 41 | 17 | 38 |
| 20 | 12 | AM20-M12ROTR | 103 | 44 | 43 | 22 | 41 | 27 | 38 |
| 25 | 12 | AM25-M12ROTR | 105 | 44 | 45 | 22 | 46 | 27 | 41 |
| 25 | 16 | AM25-M16ROTR | 105 | 44 | 45 | 22 | 46 | 32 | 41 |
| 30 | 16 | AM30-M16ROTR | 125 | 50 | 57 | 27 | 50 | 32 | 48 |
| 38 | 8 | AM38-M8ROTR | 147 | 48 | 32 | 33 | 60 | 17 | 54 |
| 38 | 12 | AM38-M12ROTR | 147 | 53 | 71 | 31 | 60 | 27 | 54 |
| 38 | 25 | AM38-M25ROTR | 147 | 63 | 71 | 33 | 60 | 46 | 54 |

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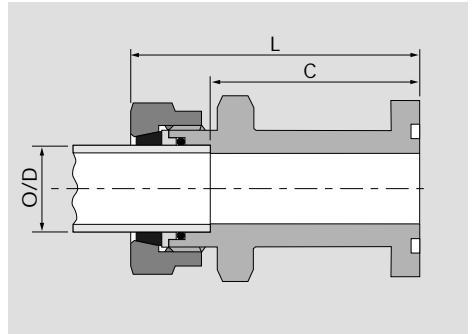


KR Metric

| O/D mm | Part No | Dimensions - mm | | | |
|--------|---------|-----------------|----|-----|------|
| | | A | B | Nut | Body |
| 6 | AM6XR | 54 | 24 | 16 | 19 |
| 8 | AM8XR | 57 | 27 | 17 | 19 |
| 10 | AM10XR | 71 | 27 | 27 | 26 |
| 12 | AM12XR | 71 | 27 | 27 | 26 |
| 16 | AM16XR | 79 | 33 | 32 | 32 |
| 38 | AM38XR | 149 | 72 | 60 | 60 |



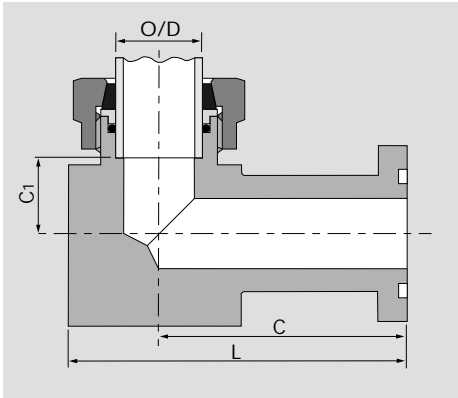
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SAE Flange Adaptor (Code 62) Straight

| O/D mm | Nom size | Part No | Dimensions - mm | | | |
|-----------|-------------|------------|-----------------|-----|-----|------|
| | | | C | L | Nut | Body |
| 20 | 3/4" | AM20-12SHR | 60 | 90 | 41 | 41 |
| 25 | 3/4" | AM25-12SHR | 62 | 92 | 46 | 41 |
| 25 | 1" | AM25-16SHR | 74 | 104 | 46 | 50 |
| 25 | 1 1/4" | AM25-20SHR | 74 | 104 | 46 | 55 |
| 30 | 1" | AM30-16SHR | 75 | 109 | 50 | 50 |
| 30 | 1 1/4" | AM30-20SHR | 75 | 109 | 50 | 55 |

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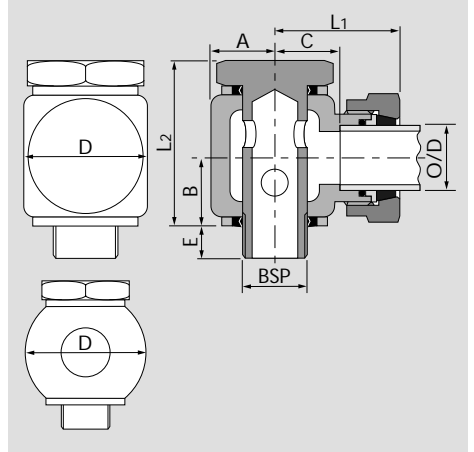


KR Metric

| O/D mm | Nom size | Part No | Dimensions - mm | | | | |
|-----------|-------------|-------------|-----------------|----|-----|-----|------|
| | | | C | C1 | L | Nut | Body |
| 20 | 3/4" | AM20-12SHER | 71 | 18 | 90 | 41 | 45 |
| 25 | 3/4" | AM25-12SHER | 73 | 19 | 94 | 46 | 45 |
| 25 | 1" | AM25-16SHER | 83 | 22 | 104 | 46 | 51 |
| 25 | 1 1/4" | AM25-20SHER | 83 | 25 | 104 | 46 | 64 |
| 30 | 1" | AM30-16SHER | 85 | 24 | 109 | 50 | 51 |
| 30 | 1 1/4" | AM30-20SHER | 85 | 27 | 109 | 50 | 64 |



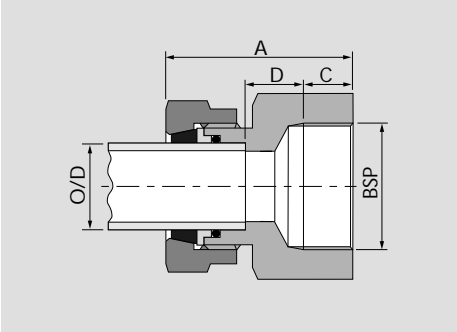
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Banjo BSP

| O/D mm | Stud BSP | Part No | Dimensions - mm | | | | | | | | Nut | Body |
|-----------|----------------|------------|-----------------|----------------|----|----|----|----|------|----|-----|------|
| | | | L ₁ | L ₂ | C | A | B | E | D | | | |
| 6 | $\frac{1}{4}$ | AM6-4BJR | 32 | 30 | 17 | 13 | 12 | 10 | Ø 29 | 16 | 19 | |
| 8 | $\frac{1}{4}$ | AM8-4BJR | 32 | 30 | 17 | 13 | 12 | 10 | Ø 29 | 17 | 19 | |
| 10 | $\frac{3}{8}$ | AM10-6BJR | 40 | 42 | 18 | 18 | 17 | 11 | Ø 38 | 27 | 22 | |
| 12 | $\frac{3}{8}$ | AM12-6BJR | 40 | 42 | 18 | 18 | 17 | 11 | Ø 38 | 27 | 22 | |
| 16 | $\frac{1}{2}$ | AM16-8BJR | 45 | 47 | 21 | 21 | 20 | 13 | Ø 45 | 32 | 27 | |
| 20 | $\frac{3}{4}$ | AM20-12BJR | 56 | 63 | 26 | 25 | 26 | 16 | Ø 59 | 41 | 33 | |
| 22 | $\frac{3}{4}$ | AM22-12BJR | 56 | 63 | 26 | 25 | 26 | 16 | Ø 59 | 41 | 33 | |
| 25 | 1 | AM25-16BJR | 62 | 75 | 31 | 29 | 31 | 17 | 57 | 46 | 41 | |
| 30 | 1 | AM30-16BJR | 69 | 81 | 36 | 32 | 34 | 17 | 64 | 50 | 41 | |
| 30 | $1\frac{1}{4}$ | AM30-20BJR | 75 | 89 | 42 | 38 | 38 | 17 | 76 | 50 | 50 | |
| 38 | $1\frac{1}{4}$ | AM38-20BJR | 82 | 96 | 44 | 38 | 41 | 17 | 76 | 60 | 50 | |
| 38 | $1\frac{1}{2}$ | AM38-24BJR | 86 | 107 | 48 | 43 | 46 | 22 | 86 | 60 | 60 | |

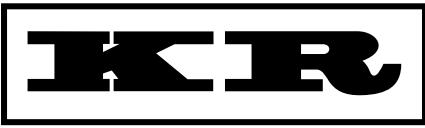
**CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL**



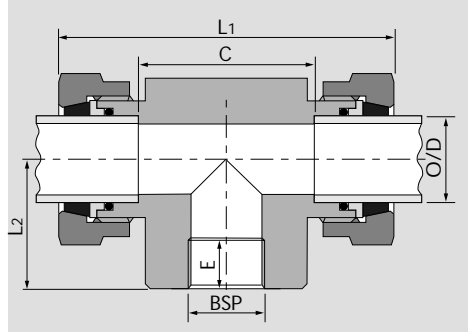
KR Metric

Female Stud Coupling BSP

| O/D Thread | | Part No | Dimensions - mm | | | | |
|------------|----------------|-------------|-----------------|----|----|-----|------|
| mm | BSP | | A | C | D | Nut | Body |
| 6 | $\frac{1}{4}$ | AM6-4FSCR | 39 | 11 | 13 | 16 | 22 |
| 8 | $\frac{1}{4}$ | AM8-4FSCR | 40 | 11 | 14 | 17 | 22 |
| 8 | $\frac{3}{8}$ | AM8-6FSCR | 42 | 13 | 14 | 17 | 24 |
| 10 | $\frac{3}{8}$ | AM10-6FSCR | 44 | 13 | 9 | 27 | 27 |
| 12 | $\frac{3}{8}$ | AM12-6FSCR | 44 | 13 | 9 | 27 | 27 |
| 16 | $\frac{1}{2}$ | AM16-8FSCR | 52 | 16 | 12 | 32 | 32 |
| 20 | $\frac{3}{4}$ | AM20-12FSCR | 61 | 19 | 12 | 41 | 41 |
| 22 | $\frac{3}{4}$ | AM22-12FSCR | 61 | 19 | 12 | 41 | 41 |
| 25 | 1 | AM25-16FSCR | 68 | 21 | 16 | 46 | 46 |
| 30 | $1\frac{1}{4}$ | AM30-20FSCR | 75 | 21 | 20 | 50 | 55 |
| 38 | $1\frac{1}{4}$ | AM38-20FSCR | 80 | 21 | 21 | 60 | 55 |
| 38 | $1\frac{1}{2}$ | AM38-24FSCR | 85 | 25 | 22 | 60 | 60 |
| 50 | 2 | AM50-32FSCR | 107 | 30 | 27 | 80 | 80 |



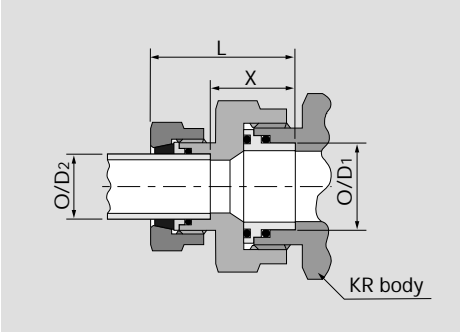
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Female Outlet Tee

| O/D mm | Stud BSP | Part No | Dimensions - mm | | | | | Nut | Body |
|-----------|-------------|--------------------|-----------------|----------------|-----------|-----------|-----------|-----------|------|
| | | | L ₁ | L ₂ | C | E | | | |
| 6 | 1/4 | AM6-4FOTR | 63 | 21 | 33 | 11 | 16 | 22 | |
| 8 | 1/4 | AM8-4FOTR | 63 | 21 | 33 | 11 | 17 | 22 | |
| 10 | 3/8 | AM10-6FOTR | 73 | 25 | 29 | 13 | 27 | 27 | |
| 12 | 3/8 | AM12-6FOTR | 73 | 25 | 29 | 13 | 27 | 27 | |
| 16 | 1/2 | AM16-8FOTR | 79 | 30 | 33 | 16 | 32 | 30 | |
| 20 | 3/4 | AM20-12FOTR | 103 | 37 | 43 | 19 | 41 | 38 | |
| 25 | 1 | AM25-16FOTR | 116 | 42 | 56 | 21 | 46 | 48 | |
| 30 | 1 1/4 | AM30-20FOTR | 134 | 45 | 68 | 21 | 50 | 51 | |
| 38 | 1 1/4 | AM38-20FOTR | 144 | 48 | 68 | 21 | 60 | 54 | |
| 38 | 1 1/2 | AM38-24FOTR | 149 | 53 | 73 | 25 | 60 | 60 | |
| 50 | 1 1/2 | AM50-24FOTR | 198 | 64 | 98 | 25 | 80 | 76 | |

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



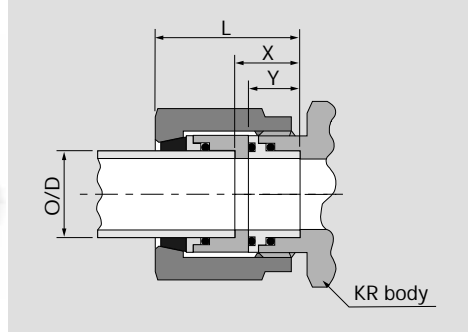
KR Metric

Reducing Nut Adaptor

| O/D mm | | Part No | Dimensions - mm | | Nut | |
|--------|----|-------------|-----------------|----|-----|----|
| 1 | 2 | | L | X | 1 | 2 |
| 8 | 6 | AM8-M6RNR | 35 | 18 | 17 | 16 |
| 10 | 8 | AM10-M8RNR | 39 | 24 | 17 | 27 |
| 10 | 6 | AM10-M6RNR | 39 | 24 | 16 | 27 |
| 12 | 10 | AM12-M10RNR | 43 | 21 | 27 | 27 |
| 12 | 8 | AM12-M8RNR | 39 | 24 | 17 | 27 |
| 12 | 6 | AM12-M6RNR | 39 | 24 | 16 | 27 |
| 16 | 12 | AM16-M12RNR | 43 | 21 | 27 | 32 |
| 16 | 10 | AM16-M10RNR | 43 | 21 | 27 | 32 |
| 16 | 8 | AM16-M8RNR | 40 | 25 | 17 | 32 |
| 16 | 6 | AM16-M6RNR | 40 | 25 | 16 | 32 |
| 20 | 16 | AM20-M16RNR | 52 | 28 | 32 | 41 |
| 20 | 12 | AM20-M12RNR | 50 | 28 | 27 | 41 |
| 20 | 10 | AM20-M10RNR | 50 | 28 | 27 | 41 |
| 25 | 20 | AM25-M20RNR | 58 | 28 | 41 | 46 |
| 25 | 16 | AM25-M16RNR | 53 | 29 | 32 | 46 |
| 25 | 12 | AM25-M12RNR | 51 | 29 | 27 | 46 |
| 30 | 25 | AM30-M25RNR | 61 | 29 | 46 | 50 |
| 30 | 20 | AM30-M20RNR | 58 | 28 | 41 | 50 |
| 30 | 16 | AM30-M16RNR | 53 | 29 | 32 | 50 |
| 38 | 30 | AM38-M30RNR | 70 | 36 | 50 | 60 |
| 38 | 25 | AM38-M25RNR | 67 | 36 | 46 | 60 |
| 38 | 20 | AM38-M20RNR | 66 | 36 | 41 | 60 |
| 50 | 38 | AM50-M38RNR | 86 | 48 | 60 | 80 |
| 50 | 30 | AM50-M30RNR | 82 | 49 | 50 | 80 |
| 50 | 25 | AM50-M25RNR | 79 | 49 | 46 | 80 |



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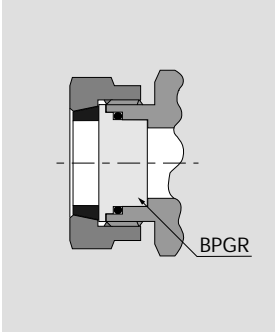


Breakaway Adaptor

The unique KR breakaway adaptor allows easy access to in-line components. Awkward and time consuming dismantling of pipe work normally required to remove components is eliminated. The breakaway adaptor will fit any of the KR Couplings up to 50 mm and 2" O/D. The adaptor replaces the nut, washer and collet of a conventional KR Coupling therefore all the tube couplings shown on pages 4 to 19 can be converted.

| O/D mm | Part No | Dimensions - mm | | | |
|--------|---------|-----------------|----|----|-----|
| | | L | X | Y | Nut |
| 6 | AM6BCR | 26 | 12 | 11 | 16 |
| 8 | AM8BCR | 26 | 12 | 11 | 17 |
| 10 | AM10BCR | 38 | 17 | 15 | 27 |
| 12 | AM12BCR | 38 | 17 | 15 | 27 |
| 16 | AM16BCR | 38 | 17 | 15 | 32 |
| 20 | AM20BCR | 49 | 21 | 19 | 41 |
| 22 | AM22BCR | 49 | 21 | 19 | 41 |
| 25 | AM25BCR | 49 | 21 | 19 | 46 |
| 30 | AM30BCR | 53 | 21 | 19 | 50 |
| 38 | AM38BCR | 62 | 25 | 22 | 60 |
| 50 | AM50BCR | 80 | 32 | 29 | 80 |

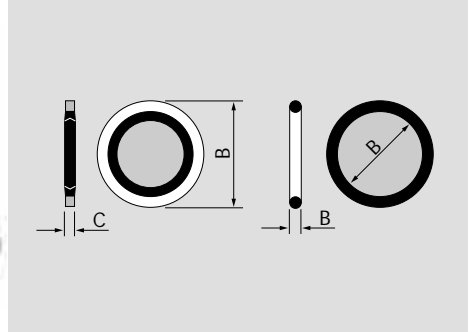
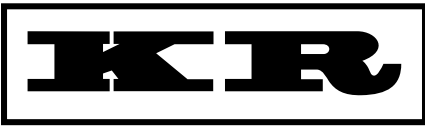
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



KR Metric

Spare Parts

| O/D mm | Part No Blanking Plug | Part No Nut | Part No Collet | Part No Washer |
|--------|--------------------------|----------------|-------------------|-------------------|
| 6 mm | M6BPGR | M6NCR | M6R | M6W |
| 8 mm | M8BPGR | M8NCR | M8R | M8W |
| 10 mm | M10BPGR | M10NCR | M10R | M10W |
| 12 mm | M12BPGR | M12NCR | M12R | M12W |
| 16 mm | M16BPGR | M16NCR | M16R | M16W |
| 20 mm | M20BPGR | M20NCR | M20R | M20W |
| 22 mm | M22BPGR | M22NCR | M22R | M22W |
| 25 mm | M25BPGR | M25NCR | M25R | M25W |
| 30 mm | M30BPGR | M30NCR | M30R | M30W |
| 38 mm | M38BPGR | M38NCR | M38R | M38W |
| 50 mm | M50BPGR | M50NCR | M50R | M50W |



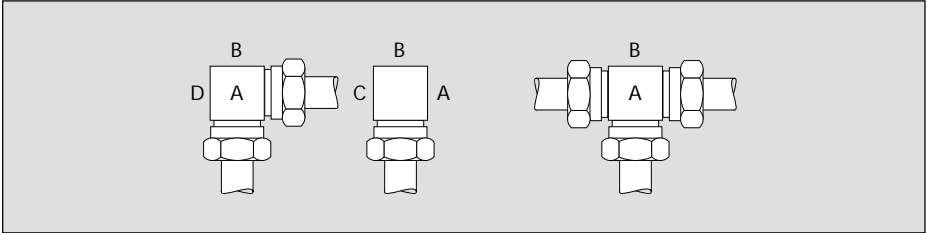
Seals

| O Ring for tube coupling O/D | | | | Bonded Washer Self Centering | | | O Ring for ISO thread | | | | |
|---------------------------------|--------------|------|-----|---------------------------------|----------|------|-----------------------|-----|--------------|------|-----|
| mm | Part No | A | B | BSP | Part No | B | C | ISO | Part No | A | B |
| 6 | 200-010-4490 | 6.1 | 1.8 | $\frac{1}{8}$ | PP45A-SC | 15.9 | 2.03 | M12 | 300-000-4490 | 9.3 | 2.2 |
| 8 | 200-011-4490 | 7.7 | 1.8 | $\frac{1}{4}$ | PP45B-SC | 20.6 | 2.0 | M14 | 300-005-4490 | 11.3 | 2.2 |
| 10 | 200-613-4490 | 9.9 | 2.6 | $\frac{3}{8}$ | PP45C-SC | 23.8 | 2.0 | M16 | 300-010-4490 | 13.3 | 2.2 |
| 12 | 200-614-4490 | 11.9 | 2.6 | $\frac{1}{2}$ | PP45D-SC | 28.6 | 2.3 | M18 | 300-015-4490 | 15.3 | 2.2 |
| 16 | 200-114-4490 | 15.5 | 2.6 | $\frac{5}{8}$ | PP45E-SC | 31.8 | 2.3 | M22 | 300-020-4490 | 19.3 | 2.2 |
| 20 | 200-211-4490 | 20.2 | 3.5 | $\frac{3}{4}$ | PP45F-SC | 34.9 | 2.3 | M27 | 300-025-4490 | 23.6 | 2.9 |
| 22 | 200-212-4490 | 21.8 | 3.5 | $\frac{7}{8}$ | PP45G-SC | 38.1 | 2.3 | M33 | 300-030-4490 | 29.6 | 2.9 |
| 25 | 200-214-4490 | 25.0 | 3.5 | 1 | PP45H-SC | 42.8 | 3.3 | M42 | 300-035-4490 | 38.6 | 2.9 |
| 30 | 200-217-4490 | 29.8 | 3.5 | $1\frac{1}{4}$ | PP45J-SC | 52.4 | 3.3 | M48 | 300-040-4490 | 44.6 | 2.9 |
| 38 | 200-222-4490 | 37.7 | 3.5 | $1\frac{1}{2}$ | PP45K-SC | 58.6 | 3.3 | M60 | 300-045-4490 | 56.6 | 2.2 |
| 50 | 207-071-4490 | 49.5 | 5.3 | 2 | PP45M-SC | 73.0 | 3.3 | | | | |

The standard seal material is nitrile, if alternative materials are required please contact our technical department for details.

**CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL**

Tappings in Tee, Elbow & Cross Couplings



KR Metric

Couplings can be supplied with any combination of tappings, subject to the maximum and minimum sizes determined by the body dimensions and pressure rating.

To order, indicate the BSP size in $\frac{1}{16}$'s of an inch (eg. $\frac{3}{8}$ " BSP = 6) and use the appropriate letter code for the face to be tapped. For tapers, add T for BSPT, AT for NPTF or AA for NPT after the thread size code.

For example:

A16ER/B6 = 1" Elbow with $\frac{3}{8}$ " BSP tapping in face B
or

A16ER/B6AT = 1" Elbow with $\frac{3}{8}$ " NPTF tapping in face B.

For scheduled forward requirements quantities of special couplings can be held in stock.

| Part No. | Max thread size |
|--------------|---------------------|
| AM10ER/TR/XR | $\frac{3}{16}$ inch |
| AM12ER/TR/XR | $\frac{1}{4}$ inch |
| AM16ER/TR/XR | $\frac{3}{8}$ inch |
| AM20ER/TR | $\frac{1}{2}$ inch |
| AM22ER/TR | $\frac{1}{2}$ inch |
| AM25ER/TR | $\frac{3}{4}$ inch |
| AM30ER/TR | 1 inch |
| AM38ER/TR/XR | 1 inch |
| AM50ER/TR | 2 inch |



CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

Imperial Range

| | | | | |
|-----------------|------------------------|------------------|--------------------|------------------------|
| Straight | A5ER | A16-8ROTR | A20BCR | A16-12MSCR |
| A4CR | A6ER | A16-12ROTR | A24BCR | A16-16MSCR |
| A5CR | A8ER | A20-12ROTR | A32BCR | A16-20MSCR |
| A6CR | A10ER | A20-16ROTR | SAE Adaptor | A20-12MSCR |
| A8CR | A12ER | A24-16ROTR | Straight | A20-16MSCR |
| A10CR | A14ER | A24-20ROTR | A12-12SHR | A20-20MSCR |
| A12CR | A16ER | Reducing | A12-16SHR | A20-24MSCR |
| A14CR | A20ER | Adaptor | A16-12SHR | A24-16MSCR |
| A16CR | A24ER | A6-5RNR | A16-16SHR | A24-20MSCR |
| A20CR | A32ER | A6-4RNR | A16-20SHR | A24-24MSCR |
| A24CR | Tee | A8-6RNR | A20-20SHR | A32-20MSCR |
| A32CR | A4TR | A8-5RNR | SAE Adaptor | A32-24MSCR |
| Reducer | A5TR | A8-4RNR | Elbow | A32-32MSCR |
| A5-4RR | A6TR | A10-8RNR | A12-12SHER | Stud Bulkhead |
| A6-5RR | A8TR | A10-6RNR | A12-16SHER | A4-4BHR |
| A6-4RR | A10TR | A10-5RNR | A16-12SHER | A5-4BHR |
| A8-6RR | A12TR | A12-10RNR | A16-16SHER | A6-4BHR |
| A8-4RR | A14TR | A12-8RNR | A16-20SHER | A8-6BHR |
| A10-8RR | A16TR | A12-6RNR | A20-20SHER | A10-8BHR |
| A12-10RR | A20TR | A14-10RNR | Male Stud | A12-12BHR |
| A12-8RR | A24TR | A14-8RNR | A4-2MSCR | A14-12BHR |
| A12-6RR | A32TR | A14-5RNR | A4-4MSCR | A16-16BHR |
| A14-12RR | Cross | A16-14RNR | A4-6MSCR | A20-16BHR |
| A16-14RR | A4XR | A16-12RNR | A4-8MSCR | A24-20BHR |
| A16-12RR | A5XR | A16-10RNR | A5-2MSCR | A32-24BHR |
| A16-8RR | A6XR | A16-8RNR | A5-4MSCR | Taper Male Stud |
| A20-16RR | A8XR | A20-16RNR | A5-6MSCR | A4-2TMSCR |
| A20-12RR | A10XR | A20-12RNR | A6-2MSCR | A4-4TMSCR |
| A24-20RR | A12XR | A20-10RNR | A6-4MSCR | A4-6TMSCR |
| A24-16RR | A14XR | A20-8RNR | A6-6MSCR | A5-2TMSCR |
| A32-24RR | A16XR | A24-20RNR | A6-8MSCR | A5-4TMSCR |
| Bulkhead | A20XR | A24-16RNR | A8-4MSCR | A5-6TMSCR |
| A4BPR | A24XR | A32-24RNR | A8-6MSCR | A6-2TMSCR |
| A5BPR | Reducing Outlet | A32-20RNR | A8-8MSCR | A6-4TMSCR |
| A6BPR | Tee | A32-16RNR | A8-12MSCR | A6-6TMSCR |
| A8BPR | A5-4ROTR | Breakaway | A10-6MSCR | A6-8TMSCR |
| A10BPR | A6-4ROTR | Adaptor | A10-8MSCR | A8-4TMSCR |
| A12BPR | A8-4ROTR | A4BCR | A10-12MSCR | A8-6TMSCR |
| A14BPR | A8-5ROTR | A5BCR | A12-6MSCR | A8-8TMSCR |
| A16BPR | A8-6ROTR | A6BCR | A12-8MSCR | A8-12TMSCR |
| A20BPR | A10-8ROTR | A8BCR | A12-12MSCR | A10-6TMSCR |
| A24BPR | A12-6ROTR | A10BCR | A12-16MSCR | A10-8TMSCR |
| A32BPR | A12-8ROTR | A12BCR | A14-8MSCR | A10-12TMSCR |
| Elbow | A14-12ROTR | A14BCR | A14-12MSCR | A12-8TMSCR |
| A4ER | A16-6ROTR | A16BCR | A14-16MSCR | A12-12TMSCR |

**CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL**

Imperial Range

| | | | | |
|------------------------|------------------------|----------------------|-----------------------|--------------------|
| A12-16TMSCR | A24-24BJR | A6-6MOTR | A24-20FOTR | No. 2 JET |
| A14-8TMSCR | Male Elbow | A8-6MOTR | A24-24FOTR | Spare Parts |
| A14-12TMSCR | A4-2MER | A8-8MOTR | A32-16FOTR | Nut |
| A14-16TMSCR | A4-4MER | A10-8MOTR | Plug | 4NCR |
| A16-12TMSCR | A5-4MER | A12-8MOTR | 4BPGR | 5NCR |
| A16-16TMSCR | A6-4MER | A12-12MOTR | 5BPGR | 6NCR |
| A16-20TMSCR | A6-6MER | A16-12MOTR | 6BPGR | 8NCR |
| A20-16TMSCR | A8-4MER | Female Stud | 8BPGR | 10NCR |
| A20-20TMSCR | A8-6MER | A4-2FSCR | 10BPGR | 12NCR |
| A20-24TMSCR | A8-8MER | A4-4FSCR | 12BPGR | 14NCR |
| A24-16TMSCR | A10-8MER | A4-6FSCR | 14BPGR | 16NCR |
| A24-20TMSCR | A12-8MER | A5-4FSCR | 16BPGR | 20NCR |
| A24-24TMSCR | A12-12MER | A5-6FSCR | 20BPGR | 24NCR |
| A32-24TMSCR | A14-12MER | A6-4FSCR | 24BPGR | 32NCR |
| Taper Male Stud | A16-12MER | A6-6FSCR | 32BPGR | Collet |
| NPT | A16-16MER | A8-4FSCR | Stud Standpipe | 4R |
| A4-4AAMSCR | A20-16MER | A8-6FSCR | 4-2SSAR | 5R |
| A5-4AAMSCR | A20-20MER | A8-8FSCR | 4-4SSAR | 6R |
| A6-6AAMSCR | A24-16MER | A10-8FSCR | 5-2SSAR | 8R |
| A8-8AAMSCR | A24-20MER | A12-8FSCR | 5-4SSAR | 10R |
| A10-8AAMSCR | A24-24MER | A12-12FSCR | 5-6SSAR | 12R |
| A12-12AAMSCR | Taper Male | A12-16FSCR | 6-4SSAR | 14R |
| A14-12AAMSCR | Elbow | A14-12FSCR | 6-6SSAR | 16R |
| A16-16AAMSCR | A4-2TMER | A16-12FSCR | 8-4SSAR | 20R |
| A20-20AAMSCR | A4-4TMER | A16-16FSCR | 8-6SSAR | 24R |
| A24-24AAMSCR | A5-4TMER | A20-16FSCR | 8-8SSAR | 32R |
| A32-24AAMSCR | A6-4TMER | A20-20FSCR | 10-6SSAR | Washer |
| Banjo | A6-6TMER | A24-20FSCR | 10-8SSAR | 4W |
| A4-2BJR | A8-4TMER | A24-24FSCR | 10-12SSAR | 5W |
| A4-4BJR | A8-6TMER | A32-24FSCR | 12-8SSAR | 6W |
| A5-4BJR | A8-8TMER | A32-32FSCR | 12-12SSAR | 8W |
| A5-6BJR | A10-8TMER | Female Outlet | 14-8SSAR | 10W |
| A6-4BJR | A12-8TMER | Tee | 14-12SSAR | 12W |
| A6-6BJR | A12-12TMER | A4-4FOTR | 14-16SSAR | 14W |
| A8-6BJR | A14-12TMER | A6-4FOTR | 16-12SSAR | 16W |
| A8-8BJR | A16-12TMER | A6-6FOTR | 16-16SSAR | 20W |
| A10-8BJR | A16-16TMER | A6-8FOTR | 20-12SSAR | 24W |
| A12-8BJR | A20-16TMER | A8-6FOTR | 20-16SSAR | 32W |
| A12-12BJR | A20-20TMER | A8-8FOTR | 20-20SSAR | |
| A14-12BJR | A24-20TMER | A10-8FOTR | 32-24SSAR | |
| A16-12BJR | A24-24TMER | A12-8FOTR | 32-32SSAR | |
| A16-16BJR | Male Outlet Tee | A12-12FOTR | Gauge Adaptors | |
| A20-16BJR | A4-4MOTR | A16-12FOTR | A4-6GAR-JET | |
| A20-20BJR | A5-4MOTR | A16-16FOTR | A6-4GAR | |
| A24-20BJR | A6-4MOTR | A20-16FOTR | No. 1 JET | |

KR Imperial

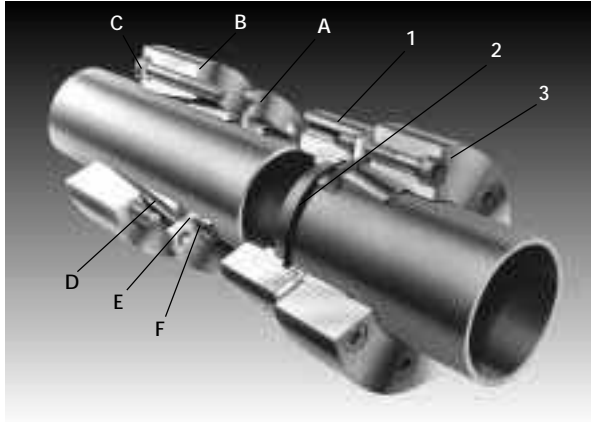


CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

KR Couplings 50 to 125 mm & 2 to 5 inch

Benefits

- Leak free - "O" ring seal
- Safe joint every time – low tightening torque and clamping force rises with the internal pressure.
- Low installed cost – no welding (so inert gas purging, NDT and excessive flushing are not required), minimal tube preparation and no special assembly equipment are required. Demountable and reusable. Can be used with most tube materials.



Features

1. Body – mild or stainless steel or cupro-nickel, compatible with most fluids and environments. Locates O ring and tube.
2. O-ring – nitrile, FPM (viton), EP or FEP encapsulated FPM, compatible with most fluids, highly resistant to leakage even under severe vibration, pressure pulsation and temperature cycling. Provides diametric seal between tube O/D and body cavity.
3. Flange Sub-assembly – mild or stainless steel or cupro-nickel, compatible with most environments. Secures the tube and retains sealing mechanism.

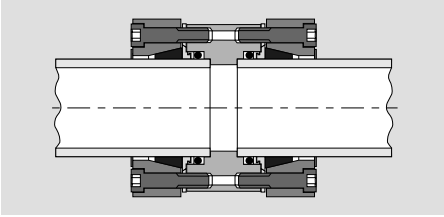
Comprising of:-

- A. Retaining Plate – holds the following components in one secure sub-assembly so easing assembly.
- B. Flange – Closes the split collet and retains sealing mechanism.
- C. Bolts – high tensile, cap head, give high compressive force at low tightening torque.
- D. Split collet – Clamping force rises with pressure. Large clamping area ensures minimal deformation of the tube. Retains tube in position.
- E. Back-up washer– Provides additional support for the tube and locates the O-ring
- F. Anti-extrusion ring – acetal, provides additional support for the O-ring, giving larger acceptable tolerances on tube O/D found on larger sizes.

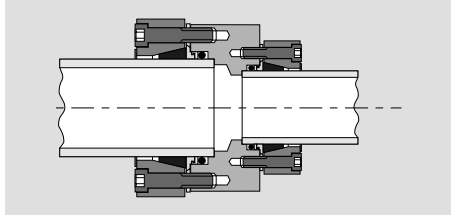
Product Approvals

- Tested to BS4368 Part 4
- Lloyds Register of Shipping
- American Bureau of Shipping
- MOD(N)

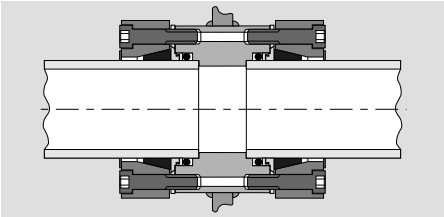
Designed & Manufactured
to suit Your System
Requirements - Please
Phone for Details



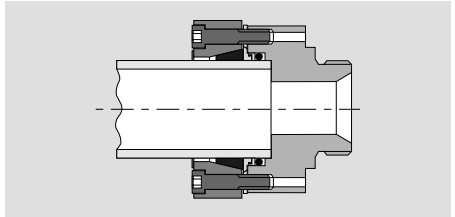
Straight



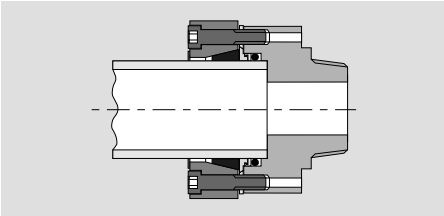
Straight Reducer



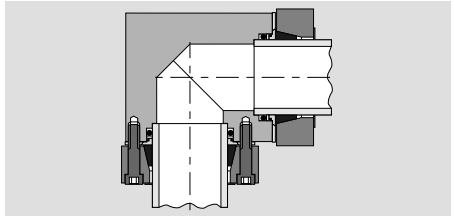
Welded Bulkhead Straight



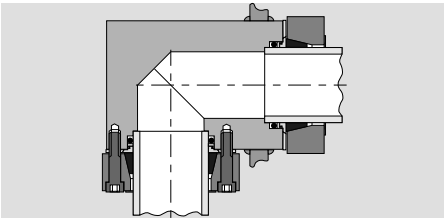
Male Stud BSP



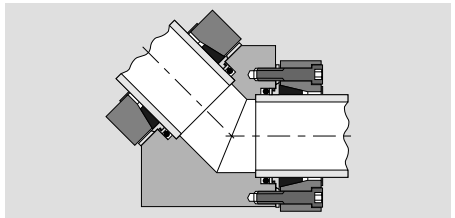
Male Stud BSPT



Elbow

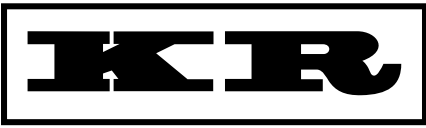


Welded Bulkhead Elbow



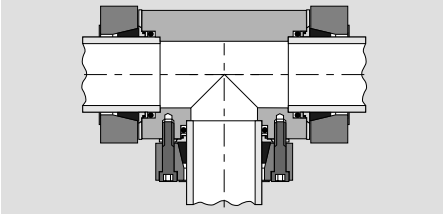
45° Elbow

KR Flange

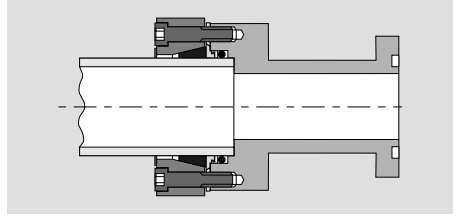


CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

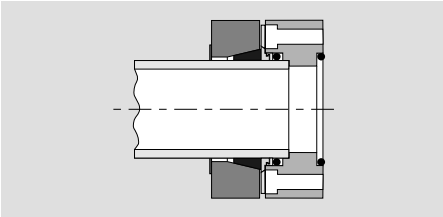
KR Couplings 50 to 125 mm & 2 to 5 inch



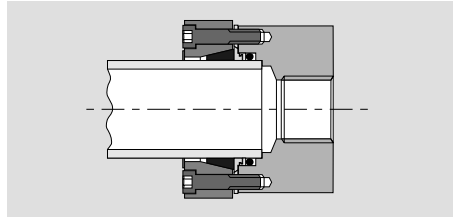
Tee



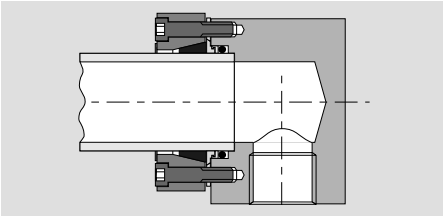
SAE Flange Adaptor, Code 61 & 62



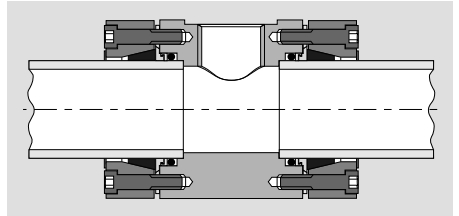
SAE Port Adaptor, Code 61 & 62



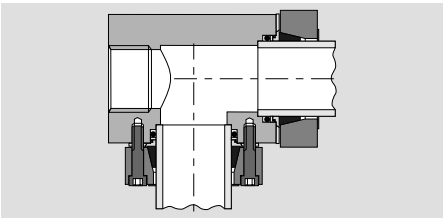
Female Stud



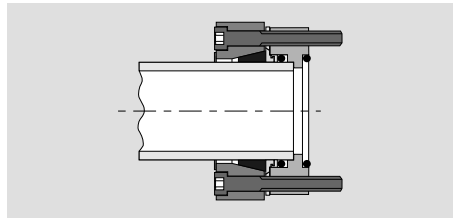
Female Elbow



Female Outlet Tee, Single & double

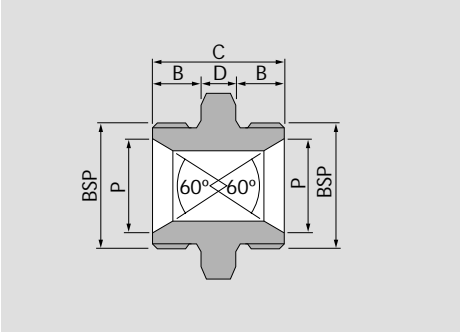


Female Run Tee



Breakaway Adaptor

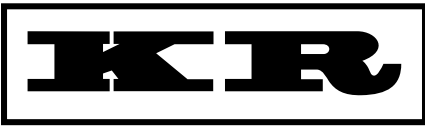
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



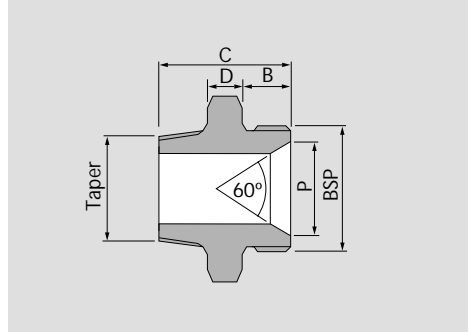
Equal Union

Adaptors

| Stud BSP | Part No | Dimensions - mm | | | | | |
|-------------|---------|-----------------|----|----|----|-----|------|
| | | B | C | D | P | A/F | A/C |
| 1/8" | EU2 | 10 | 27 | 8 | 8 | 14 | 16.1 |
| 1/4" | EU4 | 11 | 30 | 8 | 11 | 19 | 22.0 |
| 3/8" | EU6 | 13 | 35 | 10 | 14 | 22 | 25.4 |
| 1/2" | EU8 | 16 | 41 | 10 | 18 | 27 | 31.2 |
| 3/4" | EU10 | 16 | 41 | 10 | 19 | 32 | 36.9 |
| 1" | EU12 | 19 | 49 | 11 | 23 | 32 | 36.9 |
| 1 1/4" | EU16 | 21 | 54 | 13 | 29 | 41 | 47.2 |
| 1 1/2" | EU20 | 21 | 56 | 14 | 37 | 50 | 57.5 |
| 2" | EU24 | 25 | 67 | 16 | 43 | 55 | 63.3 |
| 2 1/2" | EU32 | 30 | 78 | 18 | 55 | 70 | 80.8 |



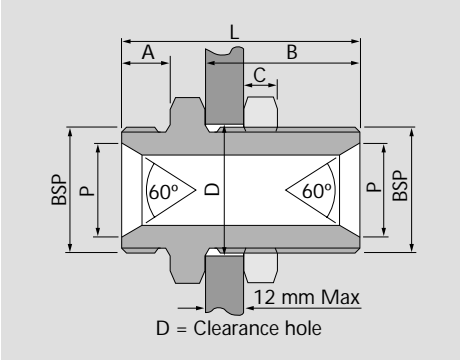
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Equal Union, Parallel/Taper

| Stud | Part No | Dimensions - mm | | | | | | | |
|-------|---------|-----------------|------|----|----|----|----|-----|------|
| | | BSP | BSPT | B | C | D | P | A/F | A/C |
| 1/8 | 1/8 | EUPT2 | | 10 | 25 | 6 | 8 | 14 | 16.2 |
| 1/4 | 1/4 | EUPT4 | | 11 | 29 | 6 | 11 | 19 | 21.9 |
| 3/8 | 3/8 | EUPT6 | | 13 | 33 | 8 | 14 | 22 | 25.4 |
| 1/2 | 1/2 | EUPT8 | | 16 | 40 | 8 | 18 | 27 | 31.2 |
| 3/4 | 3/4 | EUPT12 | | 19 | 48 | 10 | 23 | 33 | 38.1 |
| 1 | 1 | EUPT16 | | 21 | 54 | 11 | 29 | 41 | 47.4 |
| 1 1/4 | 1 1/4 | EUPT20 | | 21 | 59 | 13 | 37 | 50 | 57.8 |
| 1 1/2 | 1 1/2 | EUPT24 | | 25 | 65 | 14 | 43 | 55 | 63.5 |
| 2 | 2 | EUPT32 | | 30 | 76 | 16 | 55 | 70 | 80.8 |
| BSP | NPTF | | | | | | | | |
| 1/8 | 1/8 | EUPAT2 | | 10 | 25 | 6 | 8 | 14 | 16.2 |
| 1/4 | 1/4 | EUPAT4 | | 11 | 32 | 6 | 11 | 19 | 21.9 |
| 3/8 | 3/8 | EUPAT6 | | 13 | 35 | 8 | 14 | 22 | 25.4 |
| | 1/2 | EUPAT8 | | 16 | 43 | 8 | 18 | 27 | 31.2 |
| 3/4 | 3/4 | EUPAT12 | | 19 | 48 | 10 | 23 | 33 | 38.1 |
| 1 | 1 | EUPAT16 | | 21 | 56 | 11 | 29 | 41 | 47.4 |
| 1 1/4 | 1 1/4 | EUPAT20 | | 21 | 58 | 13 | 37 | 50 | 57.5 |

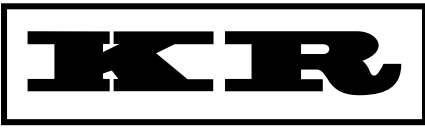
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



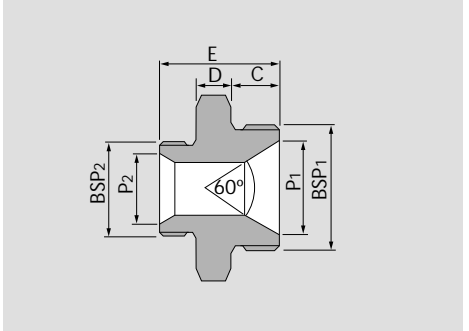
Equal Union Bulkhead

| Stud BSP | Part No | Dimensions - mm | | | | | | Body | | Nut |
|-------------|---------|-----------------|------|------|----|----|------|------|------|-----|
| | | A | B | L | C | D | P | A/F | A/C | A/F |
| 1/4 | EUBH4 | 11.1 | 28.6 | 47.6 | 6 | 15 | 10.5 | 19 | 21.9 | 19 |
| 3/8 | EUBH6 | 12.7 | 31.7 | 53.9 | 7 | 18 | 14.0 | 22 | 25.4 | 22 |
| 1/2 | EUBH8 | 15.9 | 34.9 | 60.3 | 8 | 23 | 17.6 | 27 | 31.1 | 27 |
| 5/8 | EUBH10 | 15.9 | 34.9 | 60.3 | 8 | 24 | 19.4 | 33 | 38.1 | 33 |
| 3/4 | EUBH12 | 19.1 | 38.1 | 68.2 | 9 | 28 | 22.9 | 33 | 38.1 | 32 |
| 1 | EUBH16 | 20.6 | 41.3 | 74.6 | 10 | 35 | 28.8 | 41 | 47.4 | 41 |
| 1 1/4 | EUBH20 | 20.6 | 44.5 | 79.4 | 14 | 43 | 36.9 | 50 | 57.8 | 50 |
| 1 1/2 | EUBH24 | 25.4 | 47.6 | 88.9 | 15 | 49 | 42.8 | 55 | 63.0 | 55 |

Adaptors



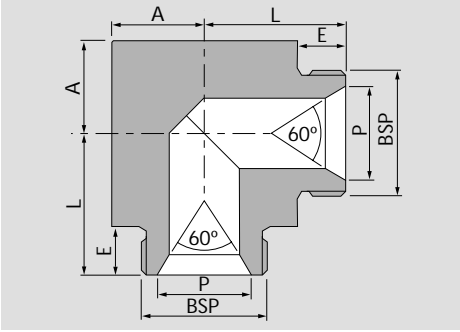
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



Unequal Union

| Stud BSP | | Part No | Dimensions - mm | | | | | |
|----------|-------|---------|-----------------|----|----|----|----|-----|
| 1 | 2 | | C | D | E | P1 | P2 | A/F |
| 1/4 | 1/8 | UU4-2 | 11 | 8 | 29 | 11 | 8 | 19 |
| 1/4 | 1/4 | UU6-4 | 13 | 10 | 33 | 14 | 11 | 22 |
| 1/2 | 1/4 | UU8-4 | 16 | 10 | 37 | 18 | 11 | 27 |
| 1/2 | 3/8 | UU8-6 | 16 | 10 | 38 | 18 | 14 | 27 |
| 3/4 | 1/4 | UU10-4 | 16 | 10 | 37 | 19 | 11 | 32 |
| 3/4 | 3/8 | UU10-6 | 16 | 10 | 38 | 19 | 14 | 32 |
| 3/4 | 1/2 | UU10-8 | 16 | 10 | 41 | 19 | 18 | 32 |
| 3/4 | 3/8 | UU12-6 | 19 | 11 | 43 | 23 | 14 | 33 |
| 3/4 | 1/2 | UU12-8 | 19 | 11 | 46 | 23 | 18 | 33 |
| 3/4 | 3/8 | UU12-10 | 19 | 11 | 46 | 23 | 19 | 33 |
| 3/4 | 1/2 | UU14-12 | 19 | 13 | 51 | 26 | 23 | 36 |
| 1 | 1/2 | UU16-8 | 21 | 13 | 49 | 29 | 18 | 41 |
| 1 | 3/8 | UU16-10 | 21 | 14 | 51 | 29 | 19 | 41 |
| 1 | 1/2 | UU16-12 | 21 | 13 | 52 | 29 | 23 | 41 |
| 1 | 3/8 | UU16-14 | 21 | 13 | 52 | 29 | 26 | 41 |
| 1 1/4 | 1 | UU20-16 | 21 | 14 | 56 | 37 | 29 | 50 |
| 1 1/2 | 1 | UU24-16 | 25 | 16 | 62 | 43 | 29 | 55 |
| 1 1/2 | 1 1/4 | UU24-20 | 25 | 16 | 62 | 43 | 37 | 55 |
| 2 | 1 | UU32-16 | 30 | 18 | 68 | 55 | 29 | 70 |
| 2 | 1 1/4 | UU32-20 | 30 | 18 | 68 | 55 | 37 | 70 |
| 2 | 1 1/2 | UU32-24 | 30 | 18 | 73 | 55 | 43 | 70 |

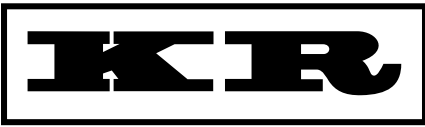
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



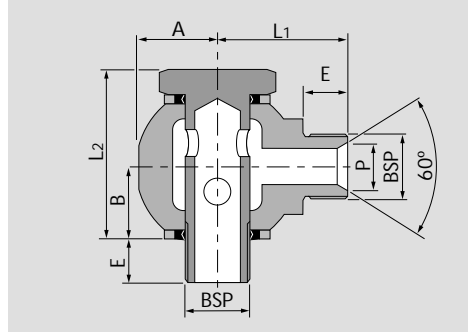
Equal Male Elbow

| Stud BSP | Part No | Dimensions - mm | | | | |
|-------------|---------|-----------------|----|----|----|-----|
| | | L | E | A | P | A/F |
| 1/8" | EME2 | 20 | 10 | 8 | 8 | 16 |
| 1/4" | EME4 | 27 | 11 | 10 | 11 | 22 |
| 3/8" | EME6 | 29 | 13 | 13 | 14 | 27 |
| 1/2" | EME8 | 33 | 16 | 16 | 18 | 32 |
| 3/4" | EME12 | 41 | 19 | 18 | 23 | 41 |
| 1" | EME16 | 45 | 21 | 23 | 29 | 48 |
| 1 1/4" | EME20 | 52 | 21 | 27 | 37 | 54 |
| 1 1/2" | EME24 | 60 | 25 | 30 | 43 | 60 |
| 2" | EME32 | 75 | 30 | 37 | 55 | 76 |

Adaptors



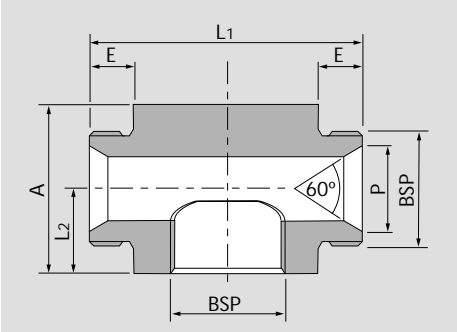
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Banjo

| Stud BSP | | Part No | Dimensions - mm | | | | | | | |
|----------|-----|----------|-----------------|----|----|----|----|----|-----|------|
| 1 | 2 | | L1 | L2 | A | B | E | P | A/F | A/C |
| 1/4 | 1/4 | A4-4BJ | 25 | 34 | 14 | 14 | 11 | 11 | 19 | 21.9 |
| 3/8 | 3/8 | A6-6BJ | 29 | 42 | 17 | 17 | 13 | 14 | 22 | 25.4 |
| 1/2 | 1/2 | A8-8BJ | 37 | 47 | 21 | 20 | 16 | 18 | 27 | 31.2 |
| 3/4 | 3/4 | A12-12BJ | 45 | 63 | 25 | 26 | 19 | 23 | 34 | 38.1 |

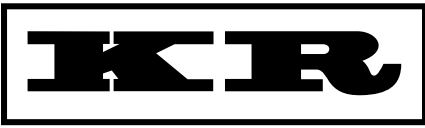
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



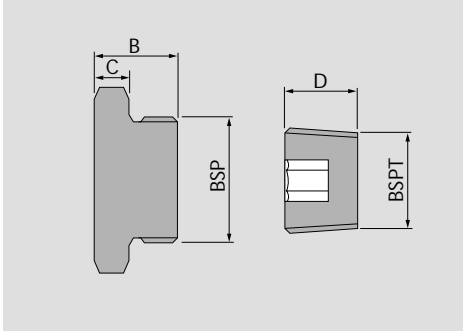
Female Outlet Male Tee

| Thread BSP | Part No | Dimensions - mm | | | | | |
|---------------|---------|-----------------|------|------|------|------|-----|
| | | L1 | L2 | E | A | P | A/F |
| 1/4 | FOMT 4 | 50.8 | 12.7 | 11.1 | 24.8 | 10.5 | 25 |
| 3/8 | FOMT 6 | 57.2 | 14.3 | 12.7 | 28.6 | 14.1 | 30 |
| 1/2 | FOMT 8 | 70.0 | 17.5 | 15.9 | 34.9 | 17.7 | 35 |
| 3/4 | FOMT 12 | 82.6 | 23.8 | 19.1 | 39.8 | 23.0 | 40 |
| 1 | FOMT 16 | 95.3 | 27.0 | 20.6 | 47.6 | 28.3 | 50 |
| 1 1/4 | FOMT 20 | 108.0 | 30.2 | 20.6 | 57.2 | 37.0 | 60 |
| 1 1/2 | FOMT 24 | 121.0 | 34.9 | 25.4 | 63.5 | 42.8 | 65 |

Adaptors



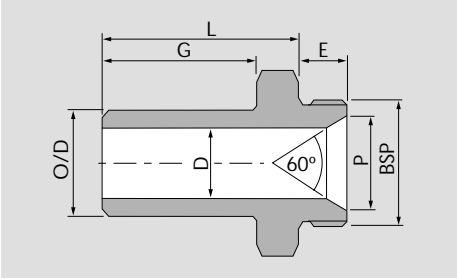
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Plug, Parallel & taper

| Stud | Part No | Dimensions - mm | | | | |
|-------|---------|-----------------|----|------|--------|------|
| | | B | C | D | A/F | A/C |
| BSP | | | | | | |
| 1/8 | P2 | 17 | 7 | | 14 | 16.2 |
| 1/4 | P4 | 18 | 7 | | 19 | 21.9 |
| 3/8 | P6 | 21 | 8 | | 22 | 25.4 |
| 1/2 | P8 | 25 | 9 | | 27 | 31.2 |
| 5/8 | P10 | 26 | 10 | | 32 | 36.9 |
| 3/4 | P12 | 29 | 10 | | 33 | 38.1 |
| 7/8 | P14 | 31 | 12 | | 36 | 41.6 |
| 1 | P16 | 33 | 12 | | 41 | 47.4 |
| 1 1/4 | P20 | 34 | 14 | | 50 | 57.8 |
| 1 1/2 | P24 | 41 | 15 | | 55 | 63.5 |
| 2 | P32 | 47 | 17 | | 70 | 80.8 |
| BSPT | | | | | | |
| 1/8 | PT2 | | | 9.5 | 3/16" | |
| 1/4 | PT4 | | | 12.7 | 1/4" | |
| 3/8 | PT6 | | | 14.3 | 5/16" | |
| 1/2 | PT8 | | | 17.5 | 3/8" | |
| 4/3 | PT12 | | | 20.6 | 1/2" | |
| 1 | PT16 | | | 25.4 | 10/16" | |

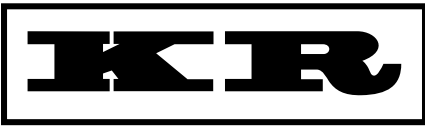
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



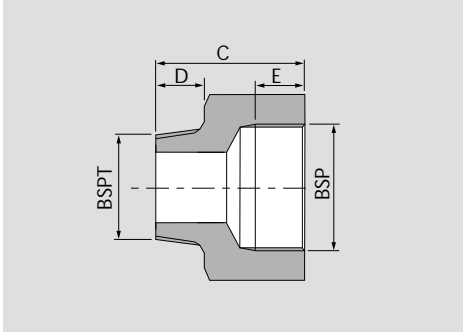
Stud Standpipe

| O/D mm | Stud BSP | Part No | Dimensions - mm | | | | | |
|-----------|-------------|------------|-----------------|----|-----|----|----|-----|
| | | | E | G | L | D | P | A/F |
| 6 | 1/8 | M6-2SSAR | 10 | 29 | 35 | 4 | 8 | 14 |
| 6 | 1/4 | M6-4SSAR | 11 | 29 | 35 | 4 | 11 | 19 |
| 8 | 1/8 | M8-2SSAR | 10 | 29 | 35 | 6 | 8 | 14 |
| 8 | 1/4 | M8-4SSAR | 11 | 29 | 35 | 6 | 11 | 19 |
| 8 | 3/8 | M8-6SSAR | 13 | 29 | 35 | 6 | 14 | 22 |
| 10 | 1/4 | M10-4SSAR | 11 | 37 | 43 | 6 | 11 | 19 |
| 10 | 3/8 | M10-6SSAR | 13 | 37 | 43 | 6 | 14 | 22 |
| 12 | 1/4 | M12-4SSAR | 11 | 37 | 43 | 6 | 11 | 19 |
| 12 | 3/8 | M12-6SSAR | 13 | 37 | 43 | 8 | 14 | 22 |
| 12 | 1/2 | M12-8SSAR | 16 | 37 | 45 | 8 | 18 | 29 |
| 16 | 3/8 | M16-6SSAR | 13 | 37 | 44 | 10 | 14 | 22 |
| 16 | 1/2 | M16-8SSAR | 16 | 37 | 45 | 10 | 18 | 29 |
| 16 | 3/4 | M16-12SSAR | 19 | 37 | 48 | 10 | 23 | 33 |
| 20 | 1/2 | M20-8SSAR | 16 | 48 | 56 | 11 | 18 | 29 |
| 20 | 3/4 | M20-12SSAR | 19 | 48 | 60 | 14 | 23 | 33 |
| 22 | 1/2 | M22-8SSAR | 11 | 48 | 56 | 11 | 18 | 29 |
| 22 | 3/4 | M22-12SSAR | 19 | 48 | 60 | 16 | 23 | 33 |
| 22 | 1 | M22-16SSAR | 21 | 48 | 60 | 16 | 29 | 41 |
| 25 | 3/4 | M25-12SSAR | 19 | 48 | 60 | 18 | 23 | 33 |
| 25 | 1 | M25-16SSAR | 21 | 48 | 60 | 18 | 29 | 41 |
| 30 | 3/4 | M30-12SSAR | 19 | 55 | 67 | 18 | 23 | 33 |
| 30 | 1 | M30-16SSAR | 21 | 55 | 67 | 22 | 29 | 41 |
| 30 | 1 1/4 | M30-20SSAR | 21 | 55 | 69 | 22 | 37 | 50 |
| 38 | 1 | M38-16SSAR | 21 | 64 | 76 | 26 | 29 | 41 |
| 38 | 1 1/4 | M38-20SSAR | 21 | 64 | 79 | 26 | 37 | 50 |
| 38 | 1 1/2 | M38-24SSAR | 25 | 64 | 79 | 26 | 43 | 55 |
| 50 | 1 1/2 | M50-24SSAR | 25 | 83 | 98 | 35 | 43 | 55 |
| 50 | 2 | M50-32SSAR | 30 | 83 | 106 | 35 | 55 | 70 |

Adaptors



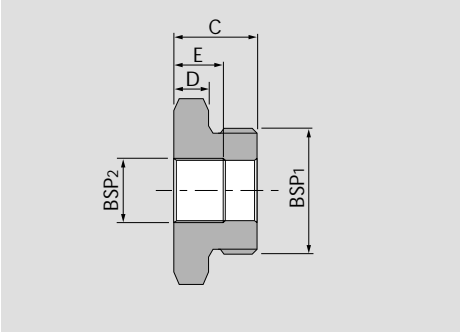
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Adaptor Bush

| | | Part No | Dimensions - mm | | | | |
|----------------|----------------|----------|-----------------|----|----|-----|------|
| BSPT | BSP | | C | D | E | A/F | A/C |
| 1 | 2 | | | | | | |
| $\frac{1}{4}$ | $\frac{1}{4}$ | AB4T-4 | 30 | 11 | 11 | 19 | 21.9 |
| $\frac{3}{8}$ | $\frac{1}{4}$ | AB6T-4 | 30 | 13 | 11 | 19 | 21.9 |
| $\frac{3}{8}$ | $\frac{3}{8}$ | AB6T-6 | 35 | 13 | 13 | 24 | 27.7 |
| $\frac{1}{2}$ | $\frac{1}{2}$ | AB8T-8 | 43 | 16 | 16 | 29 | 33.5 |
| $\frac{3}{4}$ | $\frac{3}{4}$ | AB12T-12 | 49 | 19 | 19 | 36 | 41.6 |
| 1 | 1 | AB16T-16 | 57 | 22 | 21 | 46 | 53.1 |
| $1\frac{1}{4}$ | $1\frac{1}{4}$ | AB20T-20 | 61 | 25 | 21 | 55 | 63.5 |
| $1\frac{1}{2}$ | $1\frac{1}{2}$ | AB24T-24 | 68 | 25 | 25 | 60 | 69.3 |
| 2 | 2 | AB32T-32 | 79 | 30 | 30 | 80 | 92.4 |

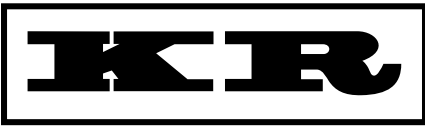
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



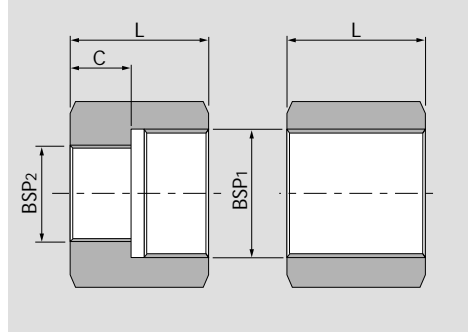
Reducing Bush

| BSP | | Part No | Dimensions - mm | | | |
|-----|-----|---------|-----------------|----|----|-----|
| 1 | 2 | | C | D | E | A/F |
| 1/4 | 1/8 | RB4-2 | 29 | 8 | 10 | 19 |
| 3/8 | 1/8 | RB6-2 | 29 | 16 | 10 | 22 |
| 3/8 | 1/4 | RB6-4 | 32 | 19 | 11 | 22 |
| 1/2 | 1/8 | RB8-2 | 30 | 14 | 10 | 27 |
| 1/2 | 1/4 | RB8-4 | 32 | 16 | 11 | 27 |
| 3/4 | 3/8 | RB8-6 | 35 | 19 | 13 | 27 |
| 1 | 3/8 | RB10-8 | 43 | 27 | 16 | 32 |
| 1 | 1/2 | RB12-4 | 29 | 10 | 11 | 32 |
| 1 | 3/4 | RB12-6 | 35 | 16 | 13 | 32 |
| 1 | 1 | RB12-8 | 41 | 22 | 16 | 32 |
| 1 | 1/4 | RB16-4 | 33 | 12 | 11 | 41 |
| 1 | 3/8 | RB16-6 | 33 | 12 | 13 | 41 |
| 1 | 1/2 | RB16-8 | 33 | 12 | 16 | 41 |
| 1 | 3/4 | RB16-12 | 45 | 24 | 19 | 41 |
| 1/4 | 3/8 | RB20-6 | 34 | 14 | 13 | 50 |
| 1/4 | 1/2 | RB20-8 | 34 | 14 | 16 | 50 |
| 1/4 | 3/4 | RB20-12 | 34 | 14 | 19 | 50 |
| 1/4 | 1 | RB20-16 | 51 | 30 | 20 | 50 |
| 1/2 | 1/2 | RB24-8 | 41 | 15 | 16 | 55 |
| 1/2 | 3/4 | RB24-12 | 41 | 15 | 19 | 55 |
| 1/2 | 1 | RB24-16 | 41 | 15 | 20 | 55 |
| 1/2 | 1/4 | RB24-20 | 59 | 33 | 20 | 55 |
| 2 | 1 | RB32-16 | 47 | 17 | 20 | 70 |
| 2 | 1/4 | RB32-20 | 47 | 17 | 20 | 70 |
| 2 | 1/2 | RB32-24 | 47 | 17 | 25 | 70 |

Adaptors



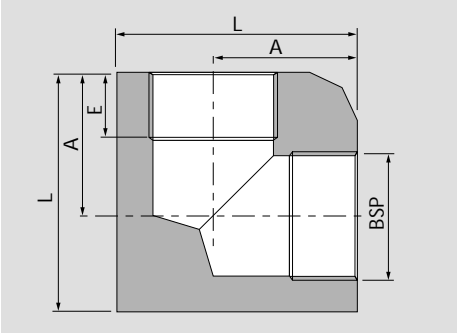
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Female Union

| BSP | | Part No | Dimensions - mm | | |
|----------------|----------------|---------|-----------------|----|-----|
| 1 | 2 | | L | C | A/F |
| $\frac{1}{8}$ | $\frac{1}{8}$ | FA2-2 | 22 | - | 17 |
| $\frac{1}{4}$ | $\frac{1}{8}$ | FA4-2 | 25 | 12 | 22 |
| $\frac{1}{4}$ | $\frac{1}{4}$ | FA4-4 | 25 | - | 22 |
| $\frac{3}{8}$ | $\frac{1}{8}$ | FA6-2 | 27 | 13 | 27 |
| $\frac{3}{8}$ | $\frac{1}{4}$ | FA6-4 | 27 | 13 | 27 |
| $\frac{5}{8}$ | $\frac{3}{8}$ | FA6-6 | 29 | - | 27 |
| $\frac{1}{2}$ | $\frac{1}{8}$ | FA8-2 | 30 | 12 | 32 |
| $\frac{1}{2}$ | $\frac{1}{4}$ | FA8-4 | 30 | 12 | 32 |
| $\frac{1}{2}$ | $\frac{3}{8}$ | FA8-6 | 32 | 14 | 32 |
| $\frac{1}{2}$ | $\frac{1}{2}$ | FA8-8 | 35 | - | 32 |
| $\frac{3}{4}$ | $\frac{3}{4}$ | FA12-12 | 41 | - | 41 |
| 1 | 1 | FA16-16 | 45 | - | 50 |
| $1\frac{1}{4}$ | $1\frac{1}{4}$ | FA20-20 | 45 | - | 60 |

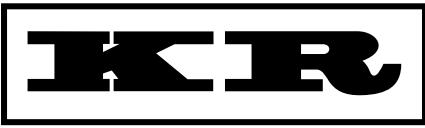
CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL



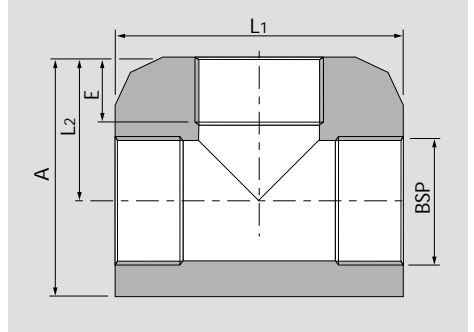
Equal Female Elbow

| BSP | Part No | Dimensions - mm | | | Body |
|----------------|---------|-----------------|-----|----|------|
| | | A | L | E | |
| $\frac{1}{8}$ | EFE2 | 17 | 27 | 10 | 19 |
| $\frac{1}{4}$ | EFE4 | 21 | 33 | 11 | 25 |
| $\frac{3}{8}$ | EFE6 | 24 | 37 | 13 | 25 |
| $\frac{1}{2}$ | EFE8 | 29 | 44 | 16 | 32 |
| $\frac{3}{4}$ | EFE12 | 35 | 56 | 19 | 41 |
| 1 | EFE16 | 41 | 67 | 21 | 51 |
| $1\frac{1}{4}$ | EFE20 | 44 | 73 | 21 | 57 |
| $1\frac{1}{2}$ | EFE24 | 52 | 83 | 25 | 60 |
| 2 | EFE32 | 64 | 102 | 30 | 76 |

Adaptors



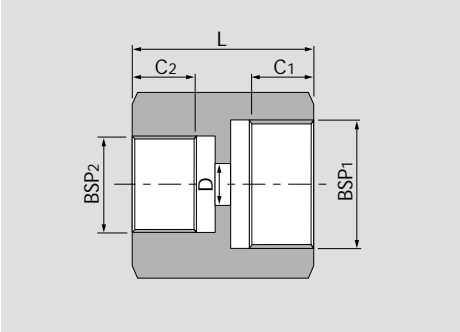
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Equal Female Tee

| BSP | Part No | Dimensions - mm | | | | |
|----------------|---------|-----------------|----------------|----|-----|------|
| | | L ₁ | L ₂ | E | A | Body |
| $\frac{1}{8}$ | EFT2 | 35 | 17 | 10 | 27 | 19 |
| $\frac{1}{4}$ | EFT4 | 41 | 21 | 11 | 33 | 25 |
| $\frac{3}{8}$ | EFT6 | 48 | 24 | 13 | 37 | 25 |
| $\frac{1}{2}$ | EFT8 | 57 | 29 | 16 | 44 | 32 |
| $\frac{3}{4}$ | EFT12 | 70 | 35 | 19 | 56 | 41 |
| 1 | EFT16 | 83 | 41 | 21 | 67 | 51 |
| $1\frac{1}{4}$ | EFT20 | 89 | 44 | 21 | 73 | 64 |
| $1\frac{1}{2}$ | EFT24 | 105 | 52 | 25 | 83 | 64 |
| 2 | EFT32 | 127 | 64 | 30 | 102 | 76 |

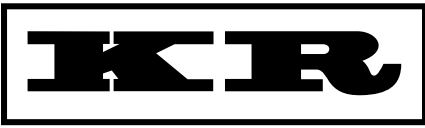
CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



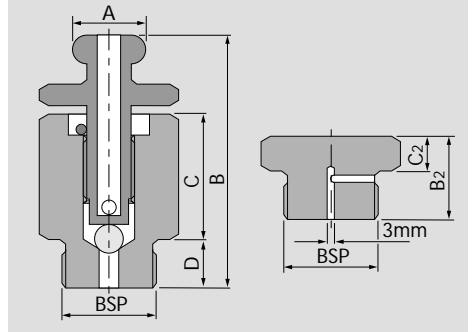
Gauge Adaptor

| BSP | | Part No | Dimensions - mm | | | | | |
|-----|-----|---------|-----------------|----------------|----------------|---|-----|------|
| 1 | 2 | | L | C ₁ | C ₂ | D | A/F | A/C |
| 1/4 | 1/4 | GA4-4 | 30 | 13 | 13 | 6 | 22 | 25.4 |
| 3/8 | 1/4 | GA6-4 | 33 | 16 | 13 | 6 | 24 | 27.7 |
| 1/2 | 1/4 | GA8-4 | 37 | 19 | 13 | 6 | 29 | 33.5 |

Adaptors



CARBON STEEL
 STAINLESS STEEL
 CUPRO NICKEL



Bleed Valve

| BSP | Part No | Dimensions - mm | | | | | | | |
|---------------|---------|-----------------|----|----------------|----|----------------|----|-----|------|
| | | A | B | B ₂ | C | C ₂ | D | Nut | Body |
| $\frac{1}{8}$ | BV2 | 8 | 40 | | 18 | | 10 | 14 | 16 |
| $\frac{1}{8}$ | P2AB | | | 17 | | 7 | | | 14 |

CARBON STEEL
STAINLESS STEEL
CUPRO NICKEL

Hydraulic Tube

Berendsen PMC recommends and supplies cold finished tubing. This method of manufacture ensures very accurate sizing, particularly on outside diameter. This means maximum grip and zero leakage when used with O/D high pressure couplings. The cold drawing process ensures remarkably good surface finish both internally and externally. This gives reduced pressure drop of the transmitted fluid and enables compression couplings to be fitted quickly and efficiently with minimum risk of damage to such items as rubber seals.

All tubing up to and including 2"/50 mm O/D is scaleless annealed, enabling simple cold manipulation for installations whilst retaining surface finish. Tube over 50 mm can be supplied in either a stress relieved or normalised condition dependent upon application. Stress relieved tubes are not suitable for cold bending but a full range of angle joints are available. Tube suffix ST354 and ST524 being fully annealed are suitable for cold bending.

All working pressures are for guidance only. Several formulae can be used for calculating the dimensions of tubes to withstand internal pressures at normal temperatures. All figures given are based upon UTS and a factor of safety of 3:1 neglecting bending. All tube is generally supplied in random lengths (4 to 6.5m). Carbon steel tube is either oil dipped or phosphated and the ends plugged. Mill certificates can be supplied if requested at the time of placing an order. Imperial, Stainless steel and cupro-nickel tube are also available on request.

Material Specification:

Part Number Suffix

- Blank (standard) = CDMS to BS3602 CFS360/DIN 2391C ST35.4
with minimum UTS of 360 N/mm²
- DOM = DOM 1026 to ASTMA513
with minimum UTS of 585 N/mm²
- ST524 = CDMS to DIN 2391C/DIN2445 ST52.4
with minimum UTS of 520 N/mm²



A full range of imperial tube also available - Please Phone for Details

Hydraulic Tube

| O/D mm | I/D mm | Max Pressure bar | Part No | Min bend radius mm | Kg/m |
|-----------|-----------|------------------------|------------------|--------------------------|--------|
| 6 x 1 | 4 | 390 | STM6 x 1 | 20 | 0.123 |
| 6 x 1.5 | 3 | 600 | STM6 x 15 | 20 | 0.166 |
| 8 x 1 | 6 | 300 | STM8 x 1 | 25 | 0.173 |
| 8 x 1.5 | 5 | 440 | STM8 x 15 | 25 | 0.240 |
| 10 x 1.5 | 7 | 350 | STM10 x 15 | 25 | 0.314 |
| 10 x 2 | 6 | 470 | STM10 x 2 | 25 | 0.395 |
| 12 x 1.5 | 9 | 300 | STM12 x 15 | 30 | 0.388 |
| 12 x 2 | 8 | 390 | STM12 x 2 | 30 | 0.493 |
| 16 x 2 | 12 | 300 | STM16 x 2 | 40 | 0.691 |
| 16 x 3 | 10 | 440 | STM16 x 3 | 40 | 0.962 |
| 20 x 2 | 16 | 230 | STM20 x 2 | 55 | 0.888 |
| 20 x 3 | 14 | 350 | STM20 x 3 | 55 | 1.26 |
| 22 x 2 | 18 | 210 | STM22 x 2 | 60 | 1.2 |
| 22 x 3 | 16 | 320 | STM22 x 3 | 60 | 1.41 |
| 25 x 3 | 19 | 280 | STM25 x 3 | 70 | 1.63 |
| 25 x 4 | 17 | 380 | STM25 x 4 | 70 | 2.07 |
| 30 x 3 | 24 | 230 | STM30 x 3 | 90 | 2.0 |
| 30 x 4 | 22 | 310 | STM30 x 4 | 90 | 2.57 |
| 30 x 5 | 20 | 390 | STM30 x 5 | 90 | 3.08 |
| 38 x 3 | 32 | 180 | STM38 x 3 | 125 | 2.59 |
| 38 x 5 | 28 | 310 | STM38 x 5 | 125 | 4.07 |
| 42 x 3 | 36 | 170 | STM42 x 3 | 130 | 2.89 |
| 50 x 3.5 | 43 | 160 | STM50 x 35 | 160 | 4.012 |
| 50 x 6 | 38 | 285 | STM50 x 6 | 160 | 6.51 |
| 50 x 8 | 34 | 380 | STM50 x 8 | 60 | 8.282 |
| 60 x 5 | 50 | 300 | STM60 x 5 DOM | | 6.904 |
| 60 x 5 | 50 | 275 | STM60 x 5 ST524 | | 6.904 |
| 70 x 5 | 60 | 270 | STM70 x 5 DOM | | 8.205 |
| 75 x 7.5 | 60 | 326 | STM75 x 75 ST524 | | 12.405 |
| 80 x 5 | 70 | 240 | STM80 x 5 DOM | | 9.419 |
| 80 x 8 | 64 | 326 | STM50 x 8 ST524 | | 14.114 |
| 90 x 5 | 80 | 200 | STM90 x 5 DOM | | 10.728 |
| 97 x 10 | 77 | 336 | STM97 x 10 ST524 | | 21.318 |
| 100 x 10 | 80 | 350 | STM100 x 10 DOM | | 22.379 |

CARBON STEEL STAINLESS STEEL CUPRO NICKEL

KR Coupling Specifications

| Working Pressure * | | | | Tube spec † | Max Surface Hardness - VPN | | |
|--------------------|----------------|-----------|-------------|--|----------------------------|-----------|--------|
| Std Tube to Tube | | Tube O/D | Tube O/D | | With | With | With |
| Couplings @ 3:1 | | tolerance | inc ovality | fully | Mild | Stainless | Cupro- |
| Safety factor | | | | annealed | Steel | Steel | Nickel |
| mm | inch | Bar | mm | | Collet | Collet | Collet |
| 6 | $\frac{1}{4}$ | 680 | ± 0.1 | Mild steel - BS3602 with O/D tolerance to BS3602 & DIN2391C | 180 | 180 | 140 |
| 8 | $\frac{5}{16}$ | 680 | ± 0.1 | | | | |
| 10 | $\frac{3}{8}$ | 680 | ± 0.1 | | | | |
| 12 | $\frac{1}{2}$ | 680 | ± 0.1 | | | | |
| 16 | $\frac{5}{8}$ | 680 | ± 0.1 | | | | |
| 20 | $\frac{3}{4}$ | 680 | ± 0.1 | Stainless steel - ASTM A 269 | 180 | 180 | 140 |
| 22 | $\frac{7}{8}$ | 680 | ± 0.1 | | | | |
| 25 | 1 | 500 | ± 0.1 | grade 316 or 304 | 180 | 180 | 140 |
| 30 | $1\frac{1}{4}$ | 500 | ± 0.1 | | | | |
| 38 | $1\frac{1}{2}$ | 500 | ± 0.15 | Cupro-nickel - 90-10 or 70-30 | 180 | 180 | 140 |
| 50 | 2 | 500 | ± 0.2 | | | | |
| | | | | Alumium Silicon Brass | 180 | 180 | 140 |
| 50 | 2 | 500 | ± 0.2 | | | | |
| | | | | Mild steel - DOM 1026 | 180 | 180 | 140 |
| 50 | $2\frac{1}{4}$ | 333 | ± 0.2 | | | | |
| | | | | ASTM A513 | 180 | 180 | 140 |
| 60 | $2\frac{3}{8}$ | 300 | ± 0.2 | | | | |
| | | | | Mild steel - DOM 1026 | 180 | 180 | 140 |
| 60 | $2\frac{1}{2}$ | 300 | ± 0.2 | | | | |
| 70 | | 350 | ± 0.25 | ASTM A513 | 180 | 180 | 140 |
| 75 | 3 | 300 | ± 0.25 | | | | |
| 80 | | 250 | ± 0.25 | ASTM A513 | 180 | 180 | 140 |
| 90 | $3\frac{1}{2}$ | 250 | ± 0.25 | | | | |
| 100 | 4 | 207 | ± 0.25 | ASTM A513 | 180 | 180 | 140 |
| | $4\frac{1}{2}$ | 207 | ± 0.25 | | | | |
| 125 | 5 | 207 | ± 0.25 | | | | |

*Derate by 50% for high pressure gas systems.

†All tube must be of good outside surface finish and within the tolerance quoted.

Coupling Materials

Standard Couplings

Body, nut/flange, washer -

Metric: mild steel-zinc plated and treated, clear finish
Imperial; mild steel-zinc plated and golden passivated
carbon steel - heat treated, phosphated with dry oil finish

Collet -

Stainless Steel Couplings

Body, flange -

AISI 316

Nut, washer -

AISI 303

Collet -

carbon steel or treated stainless steel or Cupro-Nickel

Cupro-Nickel Couplings

Body, nut/flange, collet, washer -

Cupro-Nickel, NES 835



O Ring Data

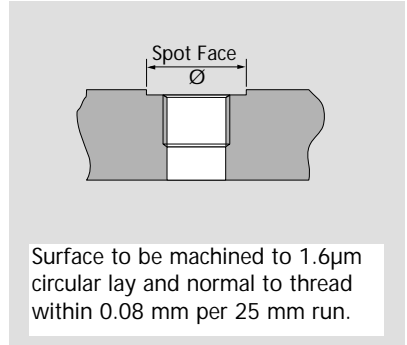
Berendsen Fluid Power stocks four different grades of 'O' rings which cover most applications encountered.

| Elastomer Type | Temperature Ranges | General Fluid Compatibility* |
|----------------------------------|--------------------|---|
| Medium Nitrile 90 Shore Hardness | -40°C to + 100°C | Mineral Oil Water in Oil Emulsion Water Glycol Air Nitrogen Carbon Dioxide Water |
| FPM (Viton) 90 Shore Hardness | -20°C to +150°C | Phosphate Ester (not Skydrol) Oxygen |
| EP (Ethylene Propylene) | -40°C to +100°C | Skydrol 500B Hot Water Castor Based Brake Fluid |
| FEP encapsulated FPM | -20°C to +150°C | Very good chemical resistance to most liquids and chemicals, with the exception of liquid alkaline metals and some fluorine compounds |

*For specific fluid compatibility and other applications e.g. paint lines, underseal, food processing, petro-chemical etc., please consult our Sales Office.

Bonded Seal Installation Data

| BSP | Torque (Nm) Single Seal | Min Spot Face Ø |
|----------------|----------------------------|--------------------|
| $\frac{1}{8}$ | 22 | 17.0 mm |
| $\frac{1}{4}$ | 40 | 21.0 mm |
| $\frac{3}{8}$ | 75 | 26.0 mm |
| $\frac{1}{2}$ | 80 | 29.0 mm |
| $\frac{5}{8}$ | 150 | 33.0 mm |
| $\frac{3}{4}$ | 160 | 36.0 mm |
| 1 | 190 | 44.0 mm |
| $1\frac{1}{4}$ | 205 | 53.0 mm |
| $1\frac{1}{2}$ | 210 | 59.0 mm |
| 2 | 215 | 74.0 mm |



General Tube Preparation

1. Ensure that tube is right for the application. It should be clean and supplied plugged and oiled with no scoring or surface deformation. It must be the correct size for the coupling, to the correct specification and within the tolerances given for the coupling to be used.
2. Berendsen Fluid Power supply 'O' rings, boom rings and fire safe seals separately, ie. not installed in the coupling. Ensure seals are the correct size for the coupling. For KR couplings use only seals supplied by Berendsen Fluid Power as these are of specific quality and specification to suit KR couplings. Nitrile, FPM (viton), E.P. and FEP encapsulated FPM 'O' rings are available. Please consult our technical department for the correct material selection.
3. All metallic tubes should be cut using a hacksaw or similar tool, preferably with a guide to ensure a 90° cut. Both the inside and outside edges should be deburred and the tube pulled through to ensure no debris is left inside. Note, if roller cutters are used on metal tube there is a danger of swaging the outside diameter and leaving a burr on the inside diameter
4. Ensure tube runs are correctly aligned. Do not attempt to use tube couplings to pull misaligned tubes together.



KR Assembly Couplings up to 50 mm & 2"

Assembly of KR couplings is very simple and requires no special tools . To ensure speedy and safe assembly every time the following instructions should be followed.

1. Before installing KR couplings follow the guidelines given for general tube preparation.
2. Unscrew the nut from the body (1). Slide nut (5), collet (4) and backup washer (3) over the tube as in fig.1. Lubricate the 'O' ring (2) and the outer surface of the collet with system fluid (for air or gas systems use silicon grease) and slide the 'O' ring over the tube taking particular care not to damage it. When used in extremely hostile environments, such as offshore, lubricate the couplings threads and the collet with grease.
3. Locate the tube end against the tube abutment in the body (1). Slide the 'O' ring and the backup washer along the tube until they are correctly located in the body's counter bore. It is important that the 'O' ring and the backup washer are fully located in the body, as fig. 2.
4. Slide the collet against the washer.
5. Screw the nut onto the body and tighten holding the body with a second spanner. The completed assembly should be as fig. 3. An indication of correct assembly is given by the gap between the nut and body shoulder being approximately 3mm. The final position of the nut in relation to the body will vary with the O/D tolerance of the tube.

Note:

If a number of couplings are assembled in a straight line, ensure the previous joint is not slackened when tightening a coupling.

6. Pressurise the system, switch off and check all nuts for tightness, retighten as necessary. It is quite common for collets to 'bed in' during initial pressurisation. Torque wrenches need not be used in normal assembly work but recommendations for the guidance of quality assurance personnel are available from our technical department.

IMPORTANT:

When refitting a used coupling always use new seals and ensure that the old seals have been removed from the body.

Additional instructions for the assembly of cupro-nickel and fire safe couplings.

Fire safe couplings are fitted with an additional seal. This secondary seal takes over when the 'O' ring is destroyed by the heat of a fire. Assembly is as for our standard couplings except that the fire safe seal is placed between the 'O' ring and the backup washer, see fig. 4. Components for the fire safe coupling are NOT interchangeable with those for our other couplings.

Cupro-nickel couplings can be specified with or without a boom ring. For couplings without a boom ring assemble as above. For couplings with a boom ring, place the boom ring between the 'O' ring and the backup washer with its concave side facing the 'O' ring, see fig. 5.

KR Assembly

Hint:

To help push the 'O' ring into the counter bore on large sizes, lightly tap the backup washer with the flats of a spanner or slide the collet against the backup washer and gently screw the nut by hand onto the body. If this method is used the nut must be removed to check the 'O' ring and washer are fully located.

Figure 1.

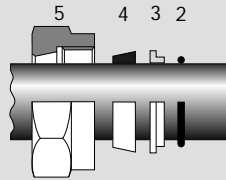


Figure 2.

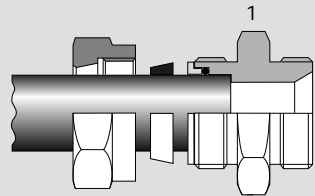


Figure 3.

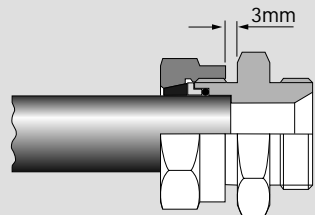


Figure 4.

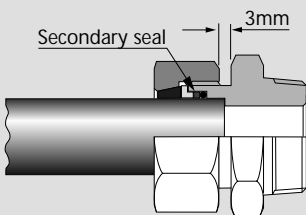
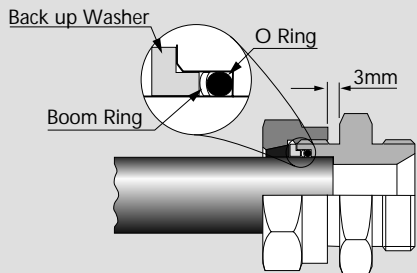


Figure 5.





KR Flange Assembly Couplings over 50 mm & 2"

Assembly of KR flange couplings is very simple and requires no special tools (other than that provided with the coupling). To ensure speedy and safe assembly every time the following instructions should be followed.

1. Before installing KR flange couplings follow the guidelines given on page 49 for tube preparation.
2. Remove the flange sub-assembly (A) from the coupling body (F). Do not unscrew the bolts past the retaining plate (B). Slide sub-assembly over the tube (fig. 1). Lubricate the 'O' ring (E) with system fluid (for air or gas systems use silicon grease) and slide it over the tube taking particular care not to damage it. When used in extremely hostile environments, such as offshore, lubricate the couplings threads and the collet with grease.
3. Locate the tube end against the tube abutment in the body (F). Slide the 'O' ring along the tube until it is correctly located in the chamfer to the counter bore of the body.
4. Slide the flange sub-assembly up to the 'O' ring, enter the tapered end of the assembly tool (provided with the coupling) as far as possible into the collet gap. Locate bolts 1 and 2 and tighten evenly until the backup washer is in its correct position (indicated by the gap between the retaining plate and the body being about 2 mm), fig 2.
5. Unscrew bolts 1 and 2 three turns and withdraw the assembly tool.
6. Fully tighten all bolts evenly in the order given, fig 3, to the correct torque, see ask our technical department for correct torque figures quoting part number, pressure rating and safety factor.

The final position of the flange in relation to the body will vary according to the O/D tolerance of the tube.

7. Pressurise the system, switch off and check all joints.

If in doubt please consult our technical department.

Note:

Do not weld a bulkhead coupling in place without first removing its flange sub-assemblies and 'O' rings.

IMPORTANT:

When refitting a used coupling always use new seals and ensure that the old seals have been removed from the body of the coupling.

Trouble shooting

In the unlikely event of a correctly assembled KR coupling leaking check for a damaged 'O' ring, malformed or misaligned tube. Simply tightening a leaking coupling cannot cure the leak; something is wrong and the tube and 'O' ring must be checked.

KR Flange Assembly

Fig 1

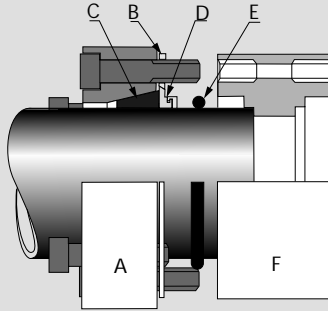


Fig 2

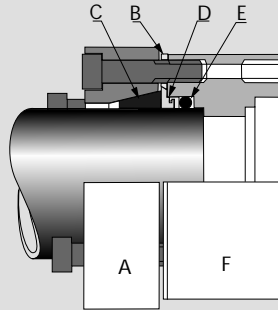
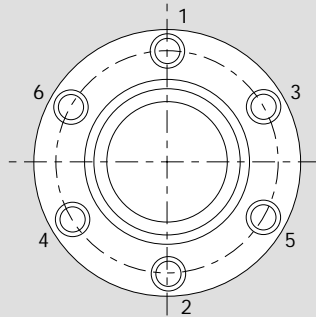


Fig 3





Pipework Installation

Obviously pipe installations are vitally important and must not be left as an afterthought to the system in which they serve a critical function.

Pipework should be laid out and should be considered early in the system design in order that the best results are achieved.

The basic operating parameters must be known to the designer to enable the correct selection of components. To help in this selection process the following hints will act as a guide.

Tube

1. Material should be compatible with the fluid or gas to be carried and the external environment. Due consideration should be given to the life expectancy. e.g. A carbon steel tube on an open deck of a ship would corrode through within 2 years without suitable protection. The use of stainless steel, copper nickel or aluminium silicon bronze tubes could well be more cost effective in the longer term.

2. Pressure rating should be capable of meeting system demand for both steady state and shock loading.

3. Outside diameter should conform to the size requirements including ovality and have a suitable surface finish.

4. Inside diameter must be clean and free from scale; this is essential in hydraulic systems. Hot finished tube will not generally provide adequate cleanliness.

5. All tube should be plugged to prevent ingress of dirt and carbon steel tube should be oiled.

Pipework Layout

1. Good appearance of pipe installation is not always easy to attain but good installation will be rewarded by reliability and can be seen by good vertical and horizontal layout.

2. Where space permits, pipe forming on the tube sizes up to 50 mm O/D is preferable to using couplings. Cold forming should always be used on annealed tubing as applying heat for bending often causes scaling in the bore of carbon steel tube and can damage the properties of copper based tubes.

3. Accessibility of couplings and inline mounted equipment is very important. Couplings in long runs should be staggered to allow for maintenance.

It is also worth considering the use of breakaway couplings to allow for the removal of inline components, should the need arise.

4. Wherever possible flexible hoses should be used to mount between rigid pipework and pumps, motors or any flexibly mounted unit. This will reduce transmitted vibration to the pipework.

Clamping

1. External vibration is difficult to predict in the early design stages but vibration and shock have an adverse effect on reliability. Firmly anchored clamping is necessary to restrain pipes from excessive movement. Clamps should be well positioned and arranged to avoid strain on pipework. A reliable system will only remain so as long as it has an equally reliable piping installation.

Couplings

1. Material must be compatible with the fluid or gas to be carried and compatible with the tube to be joined. The same comments with regard to life of the tube apply to the couplings. It is possible to use a proprietary mastic tape to protect carbon steel couplings when used with non-ferrous tubing.

2. Pressure rating should be capable of meeting system demand for both steady state and shock loading.

3. The coupling seal must be compatible with the fluid or gas in the system.

4. The coupling design must be capable of withstanding any external vibration or shock loading and where necessary must comply to the necessary certification requirements.

5. Pipes should be arranged so that they enter the coupling freely and in line. Straining pipe into couplings at an angle could cause premature failure. Bends adjacent to couplings should have a minimum of 25 mm straight pipe before the start of the radius to the back of the coupling nut. Bends in pipes close to couplings can effect the diameter and hence the gripping and sealing mechanism of the coupling.

Pipe Sizing

Pipe Sizing

The accepted flow velocity for pressure lines is between 2.2 and 4.6 m/sec and for suction & return lines between 0.6 and 1.4 m/sec.

Table 1 shows the relationship between flow, tube bore and flow velocity. Lining up the appropriate flow rate on the left hand column and the desired flow velocity on the right hand column gives the approximate bore size in the centre.

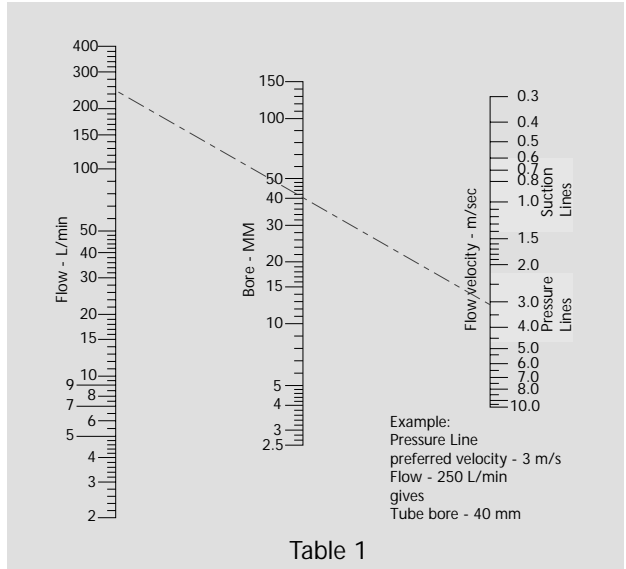


Table 1

| | |
|--------------------------|-----|
| Tee, flow main to branch | 70 |
| Tee, flow branch to main | 100 |
| Tee, flow divider | 70 |
| 45° Elbow | 20 |
| 90° Elbow, std sweep | 30 |
| 90° Elbow, med sweep | 20 |
| 90° Elbow, Long sweep | 15 |
| 90° Elbow, square | 70 |
| Welded Bends | 70 |
| Self Seal Couplings | 180 |

Table 2

Equivalent straight lengths of tube in tube bores to be added to the pipe run when calculating pressure drop. Example - using 40mm I/D tube, each 90° square elbow will add a pressure drop the equivalent to 2800 mm (40 x 70) of straight pipe.



Pressure Drop Calculations

Pressure Losses in Pipework

The calculation below will give the pressure drop within the pipework, the pressure at the pump and/or bore of the tube can be adjusted accordingly

Fluid flow in pipework system will result in an energy loss due to surface friction, changes in flow area and direction. Pressure loss is dependent amongst other factors on density and viscosity which will vary with temperature. The pressure loss will also vary according to whether the flow is laminar or turbulent.

There are several methods available to calculate the theoretical loss in a straight piece of pipe, one of which is shown below. To be added to this are the additional losses caused by changes in section or direction. These can be established using the equivalent length method. Table 2, page 55, gives the additional lengths of pipe to be added to the overall length for each fitting, etc

Nomenclature

- Q = Flow Rate, m³/s
- A = Pipe Area, m²
- P = Density of Oil, kg/m³
- V = Velocity of Oil, m/s
- √ = Kinematic Viscosity of Oil, m²/s
- μ = Absolute or dynamic viscosity, Ns/m²
- F = Friction Factor for Tube
- L = Total Length of Pipe including additions for Joints, m
- d = Pipe Bore, m
- ΔP = Pressure drop, N/m²

Conversion Factors

- Flow
 - 1 L/min = $\frac{10^{-3}}{60}$ m³/s
- Kinematic Viscosity
 - 1 cst = 10⁻⁶ m²/s
- Pressure
 - 1 bar = 10⁵ N/m²
- Dynamic viscosity
 - 1 Poise = 0.1 Ns/m²

Calculation

- 1) Velocity of Oil in Pipe
 - $V = \frac{Q}{A}$ m/s

- 2) Reynolds number

$$Re = \frac{Vd}{\sqrt{\mu}} \text{ or } Re = \frac{Vdp}{\mu}$$

For Reynolds numbers up to 1800 flow is laminar. For Reynolds numbers from 2200 flow is turbulent. For Reynolds numbers in region 1800-2200 flow is transient and both conditions should be calculated.

For Laminar Flow

- 3) Darcy formula

$$F = \frac{16}{Re}$$

For Turbulent Flow

- 4) Blasius Formula

$$F = \frac{0.079}{Re^{1/4}}$$

- 5) Total Pressure Drop for Laminar or Turbulent flow

$$\Delta P = \frac{2FLPV^2}{d} \text{ N/m}^2$$

- 6) Total Pressure Drop for Laminar flow

$$\Delta P = \frac{128\mu LQ}{\pi d^4} \text{ N/m}^2$$

These calculations assume the use of smooth bore tube, cold drawn tube being recommended.

Fluid Viscosities & Densities

| Fluid | Approximate Kinematic Viscosity @40° C | Density @ 15° C |
|---------------------------------|--|-------------------------------|
| Mineral Oil | | |
| Grade 32 | 32 cSt | 873 kg/m ³ |
| Grade 46 | 46 cSt | 878 kg/m ³ |
| HFB Water in oil emulsion 60/40 | | |
| Light Grade | 46 cSt | 935 kg/m ³ |
| Heavy Grade | 90 cSt | 950 kg/m ³ |
| HFA 5/95 | 1.0 cSt | 1000 kg/m ³ |
| HFC Water Glycol | 42 cSt | 1060 kg/m ³ |
| HFD Phosphate Ester | 30 - 45 cSt | 1130 - 1170 kg/m ³ |

Note: These figure are typical values only, sepcific values must be obtained from the oil manufacturer.

Wall Thickness Calculations

Calculation of Pipework Wall Thickness

Calculation for wall thickness is given below or if standard sizes of tube are required the table on page 46 gives the working pressure with a safety factor of 3:1 neglecting the effects of bending.

A number of formulae can be employed for calculating the wall thickness of tubes to withstand internal pressure. The two most often used are:

1) Barlows Formula

$$P = \frac{2St}{D} \quad \text{or} \quad t = \frac{PD}{2S} \quad \text{mm}$$

2) Lame's Formula

$$P = \frac{10S(R^2 - r^2)}{(R^2 + r^2)} \quad \text{mm}$$

Or

$$t = r(\sqrt{\frac{S}{S-P}} - 1) \quad \text{mm}$$

Lame's formulae is considered more accurate for thick wall tubes where high pressures are used.

- P = Internal Pressure, N/m²
- S = Permissible Stress, N/m²
- t = Wall Thickness, mm
- D = Outside Diameter, mm
- d = Inside Diameter, mm
- R = Outside Radius, mm
- r = Inside Radius, mm

Note:

A reduction of 12.5% in the permissible stress (S) should be made if the tube is to be bent.

Tube Material Stress

| Tube Material | UTS (min) N/mm ² | Yield Stress N/mm ² | 0.2% Proof stress N/mm ² |
|--------------------------|--------------------------------|-----------------------------------|--|
| Mild Steel | | | |
| BS 3602, CFS 360 | 360 | 215 | 207 |
| BS 3602, CFS 410 | 410 | 245 | 237 |
| BS 3602, CFS 460 | 460 | 280 | 264 |
| BS 3603, CFS 410 | 410 | 235 | - |
| DOM 1026 to ASTM A513 | | | |
| Stress relieved | 585 | 518 | - |
| Normalised | 493 | 355 | - |
| Stainless Steel | | | |
| ASTM A269 Grade 316 | 517 | 207 | 206 |
| Aluminium Silicon Bronze | | | |
| DGS 1182 D | 450 | - | 210 |
| Copper Nickel | | | |
| 90/10 | 270 | 68.6** | 108* |
| 70/30 | 360 | 79.4** | 123* |

* As quoted in BS 1306 - 1975. ** Permissible stress for metal temperatures up to 75° C

Note: These figures are for guidance only. Please consult the tube manufacturer for the latest specification.



Conversion Tables

| Multiply | by | to obtain | Multiply | by | to obtain | Multiply | by | to obtain |
|----------------------|--------------|----------------------|----------------------------|--------------|--------------------|---------------------|------------|---------------------|
| Acceleration | | | Imp gal/min | 0.0000757682 | m ³ /s | mm | 0.03937008 | in |
| cm/s/s | 0.03281 | ft/s/s | Imp gal/min | 1.20095 | US gal/min | yd | 0.9144 | m |
| ft/s/s | 30.48 | cm/s/s | US gal/min | 0.83267 | Imp gal/min | Power | | |
| ft/s/s | 0.3048 | m/s/s | US gal/min | 3.785412 | l/min | ft lbf/s | 0.00818 | hp |
| inch/s/s | 0.0254 | m/s/s | Force | | | ft lbf/s | 0.001356 | kW |
| m/s/s | 3.28084 | ft/s/s | kg f | 2.2046 | lb f | ft lbf/s | 1.3558 | W |
| m/s/s | 39.37008 | in/s/s | kg f | 9.80665 | N | hp | 550.0 | ft lbf/s |
| Area | | | kg f | 0.0009842 | ton f | hp | 0.7457 | kW |
| cm ² | 0.1550003 | in ² | lb f | 0.4536 | kg f | hp | 745.7 | W |
| cm ² | 0.001076391 | ft ² | lb f | 4.448 | N | kW | 737.6 | ft lbf/s |
| ft ² | 0.09290304 | m ² | N | 0.1019716 | kg f | kW | 1.341 | hp |
| ft ² | 929.0304 | cm ² | N | 0.2248089 | lb f | kW | 1000.0 | W |
| ft ² | 92903.04 | mm ² | N | 0.0001004 | ton f | W | 0.7376 | ft lbf/s |
| in ² | 645.16 | mm ² | ton f | 1016.0 | kg f | W | 0.001341 | hp |
| in ² | 6.4516 | cm ² | ton f | 9964.0 | N | W | 0.001 | kW |
| in ² | 0.00064516 | m ² | Kinematic viscosity | | | Pressure | | |
| m ² | 1550.003 | in ² | cSt | 1.0 | mm ² /s | atm | 1.013 | bar |
| m ² | 10.76391 | ft ² | cSt | 0.00001076 | ft ² /s | atm | 29.92 | in Hg |
| m ² | 1.19599 | yd ² | cSt | 0.00155 | in ² /s | atm | 1.013 | kgf/cm ² |
| mm ² | 0.0000107639 | ft ² | cSt | 0.000001 | m ² /s | atm | 14.6959 | lbf/in ² |
| mm ² | 0.001550003 | in ² | ft ² /s | 92903.0 | cSt | atm | 760.0 | mm Hg |
| yd ² | 0.8361274 | m ² | ft ² /s | 144.0 | in ² /s | atm | 101325.0 | N/m ² |
| Density | | | ft ² /s | 0.0929 | m ² /s | bar | 29.53 | in Hg |
| g/cm ³ | 0.03612730 | lb/in ³ | in ² /s | 645.2 | cSt | bar | 1.02 | kgf/cm ² |
| kg/m ³ | 0.06242797 | lb/ft ³ | in ² /s | 0.006944 | ft ² /s | bar | 14.50377 | lbf/in ² |
| kg/m ³ | 0.01002242 | lb/Imp gal | in ² /s | 0.0006452 | m ² /s | bar | 750.1 | mm Hg |
| kg/m ³ | 0.000036046 | lb/in ³ | m ² /s | 1000000.0 | cSt | bar | 100000.0 | N/m ² |
| lb/ft ³ | 16.01846 | kg/m ³ | m ² /s | 10.76 | ft ² /s | in Hg | 0.03342 | atm |
| lb/in ³ | 27.67990 | g/cm ³ | m ² /s | 1550.0 | in ² /s | in Hg | 0.03386 | bar |
| lb/Imp gal | 99.77633 | kg/m ³ | Length | | | in Hg | 0.03453 | kgf/cm ² |
| Flow | | | cm | 0.0328084 | ft | in Hg | 0.4911 | lbf/in ² |
| ft ³ /min | 28.31685 | l/min | cm | 0.3937008 | in | in Hg | 25.4 | mm Hg |
| ft ³ /min | 0.0004719474 | m ³ /s | ft | 0.3048 | m | kgf/cm ² | 0.9807 | bar |
| l/min | 0.03531466 | ft ³ /min | ft | 30.48 | cm | kgf/cm ² | 28.96 | in Hg |
| l/min | 0.0005886 | ft ³ /s | ft | 304.8 | mm | kgf/cm ² | 14.22 | lbf/in ² |
| l/min | 0.22 | Imp gal/min | in | 0.0254 | m | kgf/cm ² | 735.6 | mm Hg |
| l/min | 0.264172 | Us gal/min | in | 2.54 | cm | kgf/cm ² | 98066.5 | N/m ² |
| m ³ /s | 2118.88 | ft ³ /min | in | 25.4 | mm | lbf/in ² | 0.06894757 | bar |
| m ³ /s | 35.31 | ft ³ /s | m | 39.37008 | mm | lbf/in ² | 2.036 | in Hg |
| m ³ /s | 13198.15 | Imp gal/min | m | 3.28084 | ft | lbf/in ² | 0.07030697 | kgf/cm ² |
| Imp gal/min | 4.546 | l/min | m | 1.093613 | yd | lbf/in ² | 51.71 | mm Hg |
| Imp gal/min | 0.004546092 | m ³ /min | mm | 0.00328084 | ft | lbf/in ² | 6894.757 | N/m ² |

| Multiply | by | to obtain | Multiply | by | to obtain |
|----------------------|--------------|----------------------|-----------------|---------------|-----------------|
| mm Hg | 0.001316 | atm | N.m | 8.851 | lbf in |
| mm Hg | 0.001333 | bar | | | |
| mm Hg | 0.03937 | in Hg | Velocity | | |
| mm Hg | 0.00136 | kgf/cm ² | cm/s | 1.968504 | ft/min |
| mm Hg | 133.3 | N/m ² | cm/s | 0.0328084 | ft/s |
| N/m ² | 0.00001 | bar | ft/min | 0.508 | cm/s |
| N/m ² | 0.0002953 | in Hg | ft/min | 0.00508 | m/s |
| N/m ² | 0.0000101972 | kgf/cm ² | ft/min | 5.08 | mm/s |
| N/m ² | 0.000145 | lbf/in ² | ft/s | 30.48 | cm/s |
| N/m ² | 0.007501 | mm Hg | ft/s | 0.3048 | m/s |
| | | | ft/s | 304.8 | mm/s |
| Stress | | | m/s | 11811.02 | ft/hour |
| kgf cm ² | 2048.0 | lbf/ft ² | m/s | 196.8504 | ft/min |
| kgf cm ² | 14.22 | lbf/in ² | m/s | 3.28084 | ft/s |
| kgf cm ² | 98070.0 | N/m ² | mm/s | 0.19685 | ft/min |
| kgf cm ² | 0.00635 | tonf/in ² | mm/s | 0.003281 | ft/s |
| lbf/ft ² | 0.0004882 | kgf cm ² | | | |
| lbf/ft ² | 0.006944 | lbf/in ² | Volume | | |
| lbf/ft ² | 47.88 | N/m ² | cm ³ | 0.06102376 | in ³ |
| lbf/ft ² | 0.0000031 | tonf/in ² | ft ³ | 0.02831685 | m ³ |
| lbf/in ² | 0.07031 | kgf cm ² | ft ³ | 28.31685 | litre |
| lbf/in ² | 144.0 | lbf/ft ² | Imp gal | 0.004546092 | m ³ |
| lbf/in ² | 6895.0 | N/m ² | Imp gal | 4.546092 | litre |
| lbf/in ² | 0.0004464 | tonf/in ² | in ³ | 16387.06 | mm ³ |
| tonf/in ² | 157.5 | kgf cm ² | in ³ | 16.38706 | cm ³ |
| tonf/in ² | 322600.0 | lbf/ft ² | in ³ | 0.00001638706 | m ³ |
| tonf/in ² | 2240.0 | lbf/in ² | litre | 0.001 | m ³ |
| tonf/in ² | 15440000.0 | N/m ² | litre | 0.2199692 | Imp gal |
| N/m ² | 0.0000102 | kgf cm ² | litre | 0.03531466 | ft ³ |
| N/m ² | 0.02089 | lbf/ft ² | m ³ | 219.9692 | Imp gal |
| N/m ² | 0.000145 | lbf/in ² | m ³ | 35.31466 | ft ³ |
| N/m ² | 0.000000648 | tonf/in ² | m ³ | 1000.0 | litre |
| | | | m ³ | 61023.76 | in ³ |
| | | | mm ³ | 0.0000610238 | in ³ |
| Torque | | | | | |
| kgf m | 7.233 | lbf ft | | | |
| kgf m | 86.8 | lbf in | Weight | | |
| kgf m | 9.80665 | N.m | g | 0.0022046 | lb |
| lbf ft | 0.1383 | kgf m | kg | 2.20462 | lb |
| lbf ft | 12.0 | lbf in | lb | 453.592 | g |
| lbf ft | 1.355818 | N.m | lb | 0.453592 | kg |
| lbf in | 0.01152 | kgf m | ton | 1.01605 | tonne |
| lbf in | 0.08333 | lbf ft | tonne | 0.984207 | ton |
| lbf in | 0.113 | N.m | | | |
| N.m | 0.1019716 | kgf m | | | |
| N.m | 0.7375621 | lbf ft | | | |

NOTE: whilst every effort has been made to ensure the accuracy of these tables Berendsen PMC Limited cannot accept any responsibilities of any inaccuracies.

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