Industrial Couplings & Clamps

Hydraulink®

Technical Information

Section 1

Hydraulink Hose and Fittings

PRODUCT SELECTION

GENERAL INFORMATION

An essential step in ensuring that a hydraulic system is safe and delivers optimum performance and service life is selecting the correct fluid conveying components.

Although a lot of the work undertaken in this industry is the replacement of existing components with a duplicate it is still good practice to check the product against the application especially if the service life of the product to be replaced was not acceptable or when fault finding on an existing system.

In some cases a problem with a hose assembly or other fluid conveying products can point to an underlying problem with the system itself or possibly the products have been incorrectly specified originally.

A simple method to assist in remembering the key selection criteria is the anagram:

F.A.C.T.O.R.S.

F = Fluid
A = Application
C = Connections
T = Temperature
O = Operating Pressures
R = Rate(s) of Flow
S = Size

F - ***FLUID***
The materials in the products selected must be compatible with the fluid that is to be conveyed. Compatibility considerations will vary between products depending on the fluid in question.

When checking product fluid compatibility the following should be taken into account;

Hose; where the application requires the use of chemicals or special oils it is advisable to ensure that the cover is also resistant. For gaseous applications it is possible that permeation could occur. Permeation, sometimes referred to as effusion, is the migration of fluid through the pores of the tube polymer resulting in gradual fluid loss. Where permeation occurs it is important to ensure that as well as the hose tube the reinforcement and cover are compatible. When conveying gaseous liquids it is advisable to pin-prick the cover to prevent fluid build-up under the cover causing blistering. Continual build-up of fluid in this blistering could eventually cause the cover to split resulting in potential hazards such as the release of toxic fumes, fire or even explosions.

Couplings & other products; As well ensuring the body material is compatible any seals in hose connectors, positional adaptors, quick release couplings, ball Valves, live swivels etc are also compatible.

Hydraulink Hose and Fittings

PRODUCT SELECTION

A - *APPLICATION*

When selecting products it is important to check how and where they are going to be used as this will help to assess the likely demands that will be placed on the products.
Some of the aspects to consider are;

- ➢ Is the product going to be installed on mobile equipment or industrial plant?
- ➢ Is the application static or dynamic?
- ➢ Any installation constraints?
- ➢ Any mechanical loadings? Care should be taken not subject products to tension or torsional loads.
- ➢ Will it be subjected to constant impulsing?
- ➢ What fluid lines best suit the application? Flexible or rigid?
  - ❖ Flexible (hose). Hose has advantages such as;
    - *Easier to route around obstacles*
    - *Helps to dampen sound*
    - *Can absorb pressure spikes*
    - *Less prone to damage from vibration or movement*
    - *Generally easier to replace in the field*
  - ❖ Rigid (pipe or tube). Advantages of rigid lines;
    - *Less susceptible to mechanical damage*
    - *Good heat dissipation*
    - *Tube can be bent to tight radii*
    - *Does not breakdown through ageing*
- ➢ If selecting hose consider the following:
  - ❖ Does the cover need to be abrasion resistant?
  - ❖ Does it need to be non-conductive?
  - ❖ Any requirement for the hose to meet any specific Industry specifications? Such as mining, marine, military etc.
  - ❖ O.D of hose if it to run over pulleys (forklift application)
  - ❖ Composition of hose, rubber or thermoplastic? Note; Thermoplastic hose types are excellent for use in the marine and food industries.

Taking the time to get a good overview of the application will help when considering other aspects in the selection process, some of which are interrelated (such as pressure, flow & size).

Some accessory products such as Quick Release Couplings & Ball valves have specific selection requirements that need to be considered. These are discussed in detail in the relevant training modules.

C - *CONNECTIONS*

When replacing an existing hose assembly match the existing end connections with the new ones. If a new assembly is being specified consider what interface (thread/sealing face) type would best suit the application. In most cases the type of connection is determined by the exit thread of the adaptor fitted to the port machined into the component to which the assembly is being fitted.

Confirm what style of hose connection is required (or preferred by the customer), where wire braided hose is being used it is possible to fit either Crimp or Re-usable (field attachable) and in low pressure applications a Push-On.

For 90° hose connections check the configuration required e.g. compact or swept bend style.

Rigid lines: pipe or tube

For pipe the most common connection is the welded type, this can be either a socket or butt weld style. Of these the butt weld should be preferred for high pressure however the socket style is the most commonly used due to the ease of assembly.

For tube there are three main options;

1. Flareless type
2. Flare type
3. Socket weld

T - *TEMPERATURE*

Two aspects of temperature must be considered when selecting products;

1. Fluid temperature; Check capability of product to withstand system fluid temperature, both minimum and maximum. Hydraulic systems can generate heat but this should not be excessive in well designed systems. The most common causes of excessive heat are undersized components or flow restrictions within the system.

2. Ambient temperature;
   The exposure to high or low ambient temperatures should also be considered. Generally there are not many issues associated with this.

   Hose is most likely to affected, some situations where a problem could occur are;
   When an installation requires hose to be run near a hot manifold it may be advisable to use a heat shield or sleeving.

   Where a hose is subjected to a high ambient temperature in conjunction with an elevated fluid temperature the service life may be reduced.

   Hose used in a cold environment, such as hoses on a forklift working in a coolstore, may have exhibit cracking on the cover.

Notes;

1. The viscosity rating of most hydraulic oils is set at a temperature of 40° Celsius.
2. Rubber polymers are affected differently by hot air than hot oil.
3. Rubber stores heat

PRODUCT SELECTION

O - *OPERATING PRESSURES*

Determine maximum system or circuit pressures, this may vary depending on the circuit function. Always take into account the possibility of pressure spikes when establishing the maximum pressures that could be generated in a system.

Remember to look at the application or function, this will help to visualise the possible loadings on the product.

For example, the crowd cylinder circuit on an excavator is more likely to be subjected to spike pressure than the slew circuit.

Always ensure that the product is working within a 4:1 safety factor. That is; the maximum pressure the product will be exposed to is less than 25% of the products minimum burst pressure. Where pressure spikes or impulsing can occur it is good practice, where this is possible, to specify a product that will be working at 75% of its pressure rating for normal system pressure, this will give a safety buffer to absorb spikes.

Note;

Any product fitted between the pump and valve will always be exposed to the highest pressures of the system.

R - *RATES OF FLOW*

There are two areas to look at with regards to fluid flow.

Volume;

This is the amount of fluid that will be flowing through the product in a given time. When selecting product it is best to look at the maximum flow that is to be conveyed. Maximum pump output is a good starting point but consideration should also be given to return flow from the piston side of cylinders, this can be high depending on the bore to annulus ratio of the cylinder.
Volume is usually measured in Gallons (imperial) or Litres (metric) per minute.

Velocity;

This is the speed of the fluid through the product and is directly related to the fluid volume and the product size. Fluid speed is a key factor in determining pressure drops and heat build up in systems.
Velocity is stated as; feet per second (imperial) or metres per second (metric)

S - *SIZE*

The size (flow area) of the product is key part in ensuring the system functions efficiently.
The flow area of the product and the volume of fluid determines the velocity of the fluid in the system. If the fluid velocity is too high then in some cases excessive pressure drop or heat generation can occur.
A Nomograph is the easiest method of determining fluid velocity for any given volume versus product size.

Notes;

The potential service life of products can be significantly reduced if they are constantly operating at maximum limits.
Some areas of the selection process are interrelated however the key to correct product selection is the understanding of the application and what is required of the product.

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

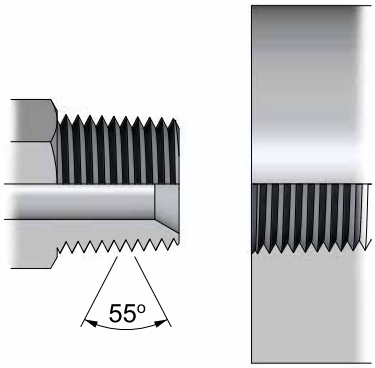
B.S.P.T. - BRITISH STANDARD PIPE TAPER

Taper: 1 in 16 by diameter

Thread Angle: 55°

The BSPT (British Standard Pipe Taper) male is intended to mate with the BSPT female only. Although the taper male will screw into BSP Parallel fixed female sockets, this is not recommended practice where avoidable as a reliable seal cannot be guaranteed.

While many BSPT males are coned 30° and will mate with BSP Parallel swivel nut females, this is not recommended practice as the taper form can deform the parallel thread and reduce the integrity of the seal.



Thread Size & TPI	Male Thread O.D. BSPT*	Female Thread I.D. BSPT
1/8-28	9.7	8.5
1/4-19	13.1	11.4
3/8-19	16.6	14.9
1/2-14	20.9	18.6
5/8-14	22.9	20.6
3/4-14	26.4	24.1
1-11	33.2	30.2
1.1/4-11	41.9	38.9
1.1/2-11	47.8	44.8
2-11	59.6	56.6

**Basic gauge plane diameter at basic gauge depth*

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

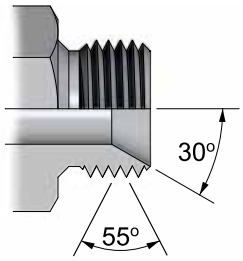
B.S.P.P. - BRITISH STANDARD PIPE PARALLEL

Thread Angle: 55°

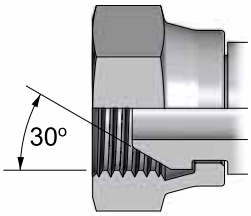
The British Standard Pipe Parallel (BSPP) male is typically coned 30° and will mate with either a BSPP swivel nut female or a BSPP female port.

BSPP female ports are normally spot faced, sealing is by either a soft metal washer, a bonded seal or a captive “O” ring.

In some cases,the port is chamfered to accept an “O” ring seal. (Similar to the U.N.O. style).



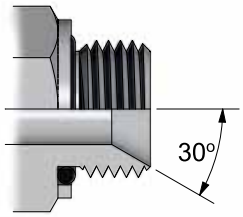
BSPP male



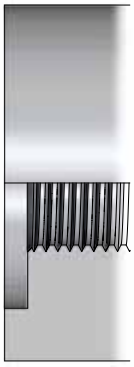
BSPP swivel nut female

Thread Size & TPI	Male Thread O.D. BSPP	Female Thread I.D. BSPP	Torque Settings BSPP nuts
1/8-28	9.7	8.5	12 Nm
1/4-19	13.1	11.4	26 Nm
3/8-19	16.6	14.9	47 Nm
1/2-14	20.9	18.6	79 Nm
5/8-14	22.9	20.6	104 Nm
3/4-14	26.4	24.1	128 Nm
1-11	33.2	30.2	160 Nm
1.1/4-11	41.9	38.9	200 Nm
1.1/2-11	47.8	44.8	270 Nm
2-11	59.6	56.6	350 Nm

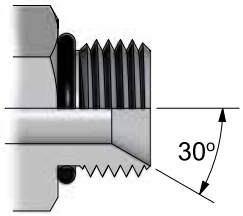
N.B. Torque values are nominal and supplied as a guide only.



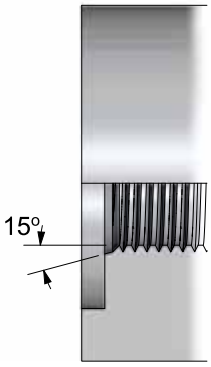
BSPP male with captive o-ring seal



BSPP female port (spot-faced)



BSPP male with o-ring seal



BSPP female port (chamfered)

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

N.P.T. - NATIONAL PIPE THREAD

N.P.T.F.; National Pipe Taper Fuel
N.P.S.M.; National Pipe Straight Mechanical
N.P.S.F.; National Pipe Straight Fuel

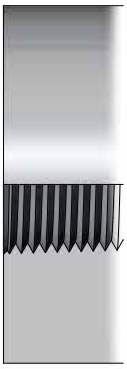
Taper: 1 in 16 by diameter.

Thread Angle: 60°

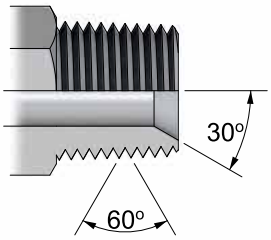
The National Pipe Taper Fuel (NPTF) male is coned 30° and will mate with the NPTF female port (taper), the National Pipe Straight Mechanical (NPSM) female (swivel nut female with 30° sealing cone), or the National Pipe Straight Fuel (NPSF) female port (parallel).

As NPTF is a “dryseal” thread, no sealing medium is required. However a sealing medium can be used to prevent thread galling.

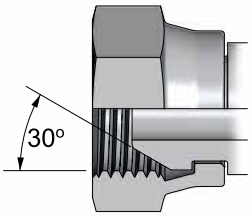
Thread Size & TPI	Male Thread O.D.	Female Thread I.D.	
	NPTF	NPTF	NPSF/SM
1/8-27	10.0	8.6	8.7
1/4-18	13.3	11.2	11.4
3/8-18	16.7	14.7	14.9
1/2-14	20.8	18.2	18.8
3/4-14	26.1	23.5	23.9
1-11.1/2	32.7	29.5	30.2
1.1/4-11.1/2	41.4	38.3	39.1
1.1/2-11.1/2	47.5	44.4	45
2-11.1/2	59.3	56.2	57



NPTF female port (taper)



NPTF male (taper)



NPSM swivel nut female

NPSF female port (parallel)

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

J.I.C / U.N. O-RING THREAD

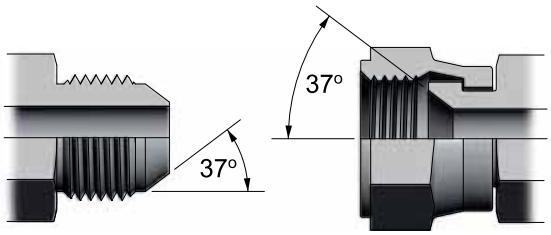
J.I.C. and U.N.“O”-Ring threads are both of the Unified National Form.

J.I.C. refers to the 37° flare type sealing face. The J.I.C. female is usually a swivel nut, but can also be a fixed socket (port) with a 37° sealing face in the base of the socket.

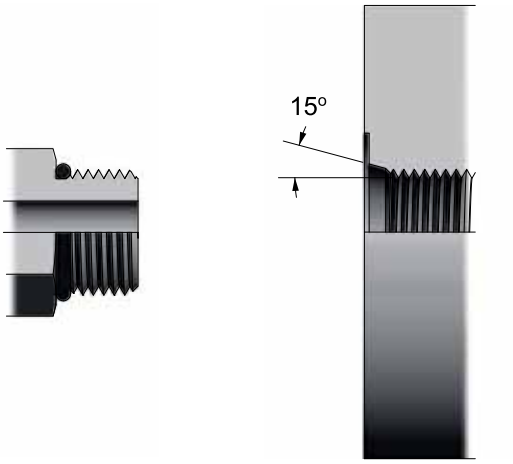
U.N.“O”-Ring refers to the thread type and “O”-Ring for sealing. The female U.N.O port has a chamfer to accept the o-ring.

Thread Size & TPI	Female Thread I.D.	Tube O.D.	Torque Settings JIC	Torque Settings UN"O"
7/16 x 20 UNF	9.8	1/4"	14 Nm	21 Nm
1/2 x 20 UNF	11.5	5/16"	19 Nm	25 Nm
9/16 x 18 UNF	13.0	3/8"	30 Nm	34 Nm
3/4 x 16 UNF	17.4	1/2"	50 Nm	72 Nm
7/8 x 14 UNF	20.3	5/8"	80 Nm	100 Nm
1 1/16 x 12 UN	24.8	3/4"	130 Nm	176 Nm
1 3/16 x 12 UN	28.2	7/8"	140 Nm	220 Nm
1 5/16 x 12 UN	31.2	1"	156 Nm	290 Nm
1 5/8 x 12 UN	39.2	1.1/4"	188 Nm	350 Nm
1 7/8 x 12 UN	45.5	1.1/2"	268 Nm	460 Nm
2 1/2 x 12 UN	61.5	2"	346 Nm	540 Nm

N.B. Torque values are nominal and supplied as a guide only.



JIC male **JIC swivel nut female**



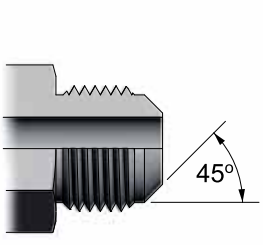
UNO male **UNO female port (chamfered)**

Hydraulink Hose and Fittings

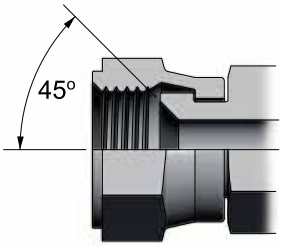
THREAD IDENTIFICATION

S.A.E. - SOCIETY OF AUTOMOTIVE ENGINEERS

This system utilises the U.N. thread series and a 45° flare sealing face. Primarily used in the automotive and refrigeration industries.



SAE male



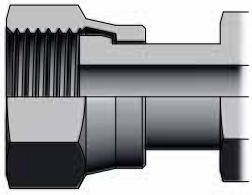
SAE swivel nut female

Thread Size & TPI	Tube O.D.	Female Thread I.D.
7/16-20	1/4"	9.8
1/2-20	5/16"	11.4
5/8-18	3/8"	14.3
11/16-16	7/16"	16
3/4-16	1/ 2"	17.5
7/8-14	5/8"	20.5
1.1/16-14	3/4"	24.8
1.1/4-12	7/8"	30.1
1.3/8-12	1"	33.2

O.R.F.S. - O-RING FACE SEAL

This system uses an “O”-Ring for sealing. The “O”-Ring is housed in the face of the male and is compressed by the face of the female on connection. Connecting threads are U.N. form.

ORFS male



ORFS swivel nut female

Thread Size & TPI	Female Thread I.D.	Tube O.D.	"O"-ring size	Torque Settings *
9/16-18 UNF	12.8	1/4"	5/16x1/16	14-16 Nm
11/16-16 UN	16.0	3/8"	3/8x1/16	24-27 Nm
13/16-16 UN	19.1	1/2"	1/2x1/16	43-47 Nm
1-14 UN	23.5	5/8"	5/8x1/16	60-69 Nm
1.3/16-12UN	26.1	3/4"	3/4x1/16	90-95 Nm
1.7/16-12 UN	34.2	1"	15/16x1/16	125-135 Nm
1.11/16-12 UN	40.6	1.1/4"	1.3/16x1/16	170-190 Nm
2-12 UN	48.0	1.1/2"	1.1/2x1/16	200-225 Nm

N.B. Torque values are nominal and supplied as a guide only.

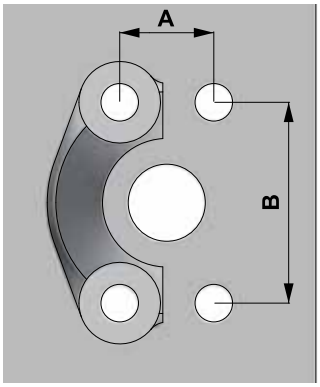
THREAD IDENTIFICATION

S.A.E. O-RING FLANGES (SAE - J518)

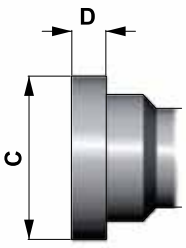
These connections utilise an “O”-Ring for sealing and are widely used for connecting to pump and motor parts as well as end terminations for pipe runs.

The “O”-Ring is housed in the flange head face and seals on a flat face female port, the flange is held in place by two clamp halves (or a one piece clamp) which are secured by four bolts.

SAE flanges are available in two pressure classes: **Standard Series, Code 61**, which goes to 5000 psi (dependent on size), and the **High Pressure Series, Code 62**, which is rated to 6000 psi for all sizes.



SAE flange clamp / port bolt spacing



SAE flange head dimensions

Nominal Flange Size	A (mm)		B (mm)		C (mm)		D (mm)	
	Code 61	Code 62	Code 61	Code 62	Code 61	Code 62	Code 61	Code 62
1/2	17.48	18.24	38.1	40.49	30.18	31.75	6.75	7.75
***5/8**	19.8	-	42.90	–	34.0	–	6.73	–
3/4	22.23	23.80	47.63	50.80	38.10	41.28	6.73	8.76
1	26.19	27.76	52.37	57.15	44.45	47.63	8.0	9.53
1.1/4	30.18	31.75	58.72	66.68	50.80	53.98	8.0	10.29
1.1/2	35.71	36.50	69.85	79.38	60.33	63.50	8.0	12.57
2	42.88	44.45	77.77	96.82	71.42	79.38	9.53	12.57

Nominal Flange Size	Pressure Rating		"O"-ring size		UNC Bolt size		Bolt torque	
	Code 61	Code 62	Code 61 and 62	AS568A number	Code 61	Code 62	Code 61	Code 62
1/2	5000 psi	6000 psi	3/4x1/8	210	5/16x1.1/4	5/16x1.1/4	20-25 Nm	20-25 Nm
3/4	5000 psi	6000 psi	1x1/8	214	3/8x1.1/4	3/8x1.1/2	28-40 Nm	34-45 Nm
1	5000 psi	6000 psi	1.5/16x1/8	219	3/8x1.1/4	7/16x1.3/4	37-48 Nm	56-68 Nm
1.1/4	4000 psi	6000 psi	1.1/2x1/8	222	7/16x1.1/2	1/2x1.3/4	48-62 Nm	85-102 Nm
1.1/2	3000 psi	6000 psi	1.7/8x1/8	225	1/2x1.1/2	5/8x2.1/4	62-79 Nm	158-181 Nm
2	3000 psi	6000 psi	2.1/4x1/8	228	1/2x1.1/2	3/4x2.3/4	73-90 Nm	271-294 Nm

**The 5/8* size flange is not part of the SAE`standard. It is included in the J.I.S. standards and is used by Komatsu and other O.E.M’s.*

N.B. Torque values are nominal and supplied as a guide only

Caterpillar flanges used on XT3 hose are the same as the SAE Code 61, XT5 flanges have the same diameter as the SAE Code 62 but are thicker in the flange head.

French Gaz (Poclain) flanges are completely different to, and will not interchange with the SAE flanges.

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

J.I.S. - JAPANESE INDUSTRIAL STANDARDS

Japanese Industrial Standards (J.I.S.) incorporate B.S.P. and metric threads as well as flanges in their connection standards.

Taper Threads:

Type R; BSPT Male *(Identical to BSP standard)*

Parallel Threads:

Type G; BSPP Male *(Identical to BSP standard)*

Type C; BSPP Swivel Nut Female *(Identical to BSP standard - for thread data please refer to BSPP section)*

Type F; BSPP Swivel Nut Female, 30° Flare Seat

Type M; Metric, Male, 30° Cone

Type MF; Metric, Swivel Nut Female, 30° Flare Seat

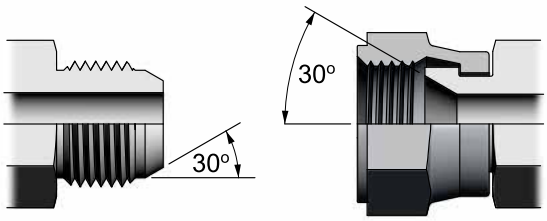
"O"-Ring Flanges:

Type I; Equivalent to Code 61 *(Identical to SAE standard)*

Type II; Equivalent to Code 62 *(Identical to SAE standard)*

THREAD SPECIFICATIONS			
Metric Threads (J.I.S)		Komatsu Threads (Metric)	
14-1.5*	12.5	**14-1.5***	12.5
18-1.5*	16.5	**18-1.5***	16.5
22-1.5*	20.5	**22-1.5***	20.5
27-2.0	25	**24-1.5**	22.5
33-2.0	31	**30-1.5**	28.5
42-2.0	40	**33-1.5**	31.5
50-2.0	48	**36-1.5**	34.5
60-2.0	58	**42-1.5**	40.5

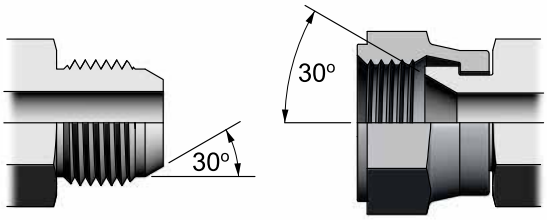
** denotes interchange sizes between JIS and Komatsu.*



Type F JIS male

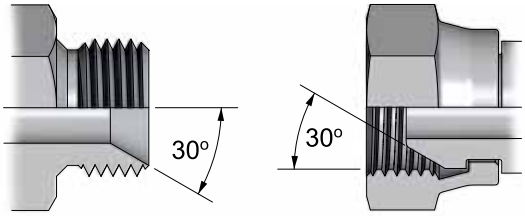
For thread data please refer to BSPP section

Type F JIS swivel nut female



Type MF JIS male

Type MF JIS swivel nut female



Type M JIS male

Type M JIS swivel nut female

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

D.I.N. METRICS 24° CONE SYSTEM

The D.I.N. System allows for the connection of hose assembies and tube in three main pressure series:

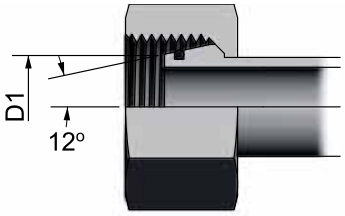
Series LL;	Extra Light, up to 100 bar
Series L;	Light up to 250 bar
Series S;	Heavy up to 640 bar

The pressure ranges are determined by the tube O.D. and the thread size e.g. a 12mm light coupling has an 18mm thread O.D. whereas a 12mm heavy coupling has a 20mm O.D. thread.

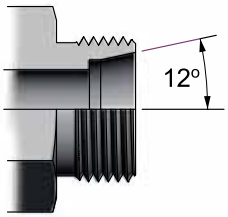
N.B: Rated coupling pressures are subject to the design pressures of the tube or hose being used.

Tubing is connected to the D.I.N. Male by the use of a cutting ring and nut. Hose assemblies can be connected by swivel nut females having either a spherical seal, 24° cone seal (can be fitted with “O”-Ring), or a standpipe with cuttting ring and nut. Hose can also be connected directly to tube by use of a hose tail with the D.I.N. Male form

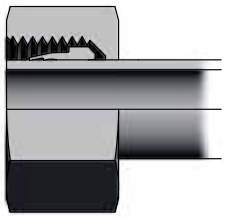
The male form will accept all three female styles shown (right).



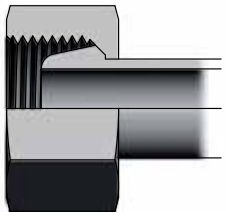
DIN 24° cone female with o-ring



DIN 24° cone male



DIN cutting ring and nut on tube



DIN female swivel nut with spherical seat

THREAD SPECIFICATIONS LIGHT (L) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter D1 (mm)	Tube O.D.(mm)
M12-1.5	10.5	7.2	6
M14-1.5	12.5	9.2	8
M16-1.5	14.5	11.6	10
M18-1.5	16.5	13.8	12
M22-1.5	20.5	16.8	15
M26-1.5	24.5	19.8	18
M30-2.0	28	23.8	22
M36-2.0	34	29.8	28
M45-2.0	43	37.2	35
M52-2.0	50	44.2	42

THREAD SPECIFICATIONS HEAVY (S) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter D1 (mm)	Tube O.D.(mm)
M14-1.5	12.5	7.2	6
M16-1.5	14.5	9.2	8
M18-1.5	16.5	11.6	10
M20-1.5	18.5	13.8	12
M22-1.5	20.5	15.8	14
M24-1.5	22.5	17.8	16
M30-2.0	28	22	20
M36-2.0	34	27	25
M42-2.0	40	32	30
M52-2.0	50	40	38

** N.B. Diameter D1 is nominal and may vary between manufacturers.*

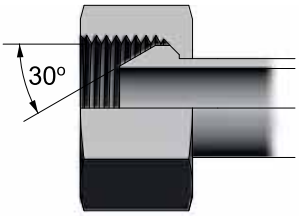
Hydraulink Hose and Fittings

THREAD IDENTIFICATION

D.I.N. METRICS 60° CONE SYSTEM

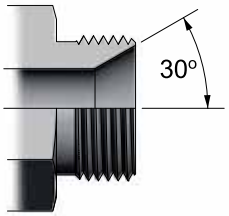
This series utilises a 60° cone seating angle and is used for the connection of hose assemblies and tube. It differs from the 24° series in that the threads are predominately 1.5mm pitch and there is no light or heavy pressure ranges.

The D.I.N. 60° male will accept the universal (spherical seat) female, a 60° coned female and tube fitted with a cutting ring and nut.

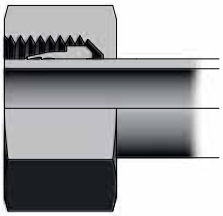


DIN 60° cone female

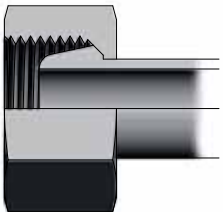
THREAD SPECIFICATIONS		
Thread O.D. & Pitch	Female Thread I.D.	Tube O.D.(mm)
M10-1.0	9.0	5
M12-1.5	10.5	6
M14-1.5	12.5	8
M16-1.5	14.5	10
M18-1.5	16.5	12
M22-1.5	20.5	15
M26-1.5	24.5	18
M30-1.5	28.5	22
M38-1.5	36.5	28
M45-1.5	43.5	35
M52-2.0	56.5	42



DIN 60° cone male



DIN cutiing ring and nut on tube

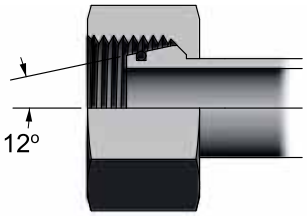


DIN female swivel nut with spherical seat

THREAD IDENTIFICATION

I.S.O. METRICS (INTERNATIONAL STANDARDS ORGANISATION)

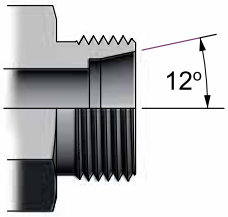
The I.S.O. series of couplings is similar to the D.I.N. light and heavy in function. The male has a 24° included angle sealing cone and a recessed counter bore for locating the tube when used in conjunction with a cutting ring and nut. The male will also accept a swivel nut female with either a cone or a spherical seal.



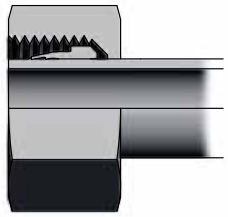
ISO (24° cone) female with o-ring

THREAD SPECIFICATIONS		
Thread O.D. & Pitch	Female Thread I.D.	Tube O.D.(mm)
M12-1.0	11.0	6
M14-1.5*	12.5	8
M16-1.5*	14.5	10
M18-1.5*	16.5	12
M20-1.5	18.5	14
M22-1.5*	20.5	15
M24-1.5**	22.5	16
M27-1.5	25.5	18
M30-1.5	28.5	22
M33-1.5	31.5	25
M36-1.5	34.5	28
M39-1.5	37.5	30
M42-1.5	40.5	32
M45-1.5	43.5	35
M48-1.5	46.5	38
M52-1.5	50.5	40

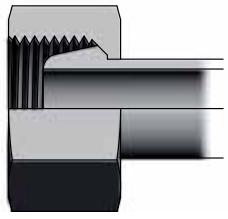
** Interchange with D.I.N. Light*
*** Interchange with D.I.N. Heavy*



ISO (24° cone) male



ISO cutting ring and nut on tube



ISO female swivel nut with spherical seat

Hydraulink Hose and Fittings

THREAD IDENTIFICATION

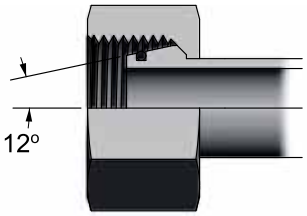
FRENCH METRICS (GAZ & MILLIMETRIQUE SERIES)

The series are similar to the D.I.N. 24° type where the male has a 24° included angle sealing cone and a recessed counterbore for locating the tube.

The male will accept a cutting ring and nut for use with tube or a swivel nut female with either a cone or spherical seal.

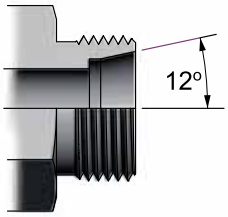
The Gaz and Millimetrique series are identical in all respects except for the O.D. of the tube:

- Gaz series uses fractional number O.D. metric tubing.
- Millimetrique series uses whole number O.D. metric tubing.

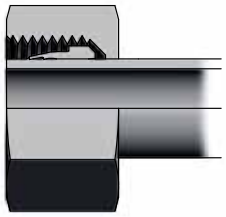


French 24° cone female with o-ring

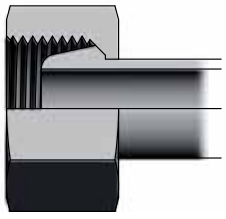
THREAD SPECIFICATIONS LIGHT (L) SERIES			
Thread O.D. & Pitch	Female Thread I.D.	Diameter GAZ	Diameter Millimetrique
M12-1.0	11.0	-	6
M14-1.5	12.5	-	8
M16-1.5	14.5	-	10
M18-1.5	16.5	-	12
M20-1.5	18.5	13.25	14
M22-1.5	20.5	-	15
M24-1.5	22.5	16.75	16
M27-1.5	25.5	-	18
M30-1.5	28.5	21.25	22
M33-1.5	31.5	-	25
M36-1.5	34.5	26.75	28
M39-1.5	37.5	-	30
M42-1.5	40.5	-	32
M45-1.5	43.5	33.5	35
M48-1.5	46.5	-	38
M52-1.5	50.5	42.25	40
M54-2.0	52.0	-	45
M58-2.0	56.0	48.25	-



French 24° cone male



Cutting ring and nut on tube



French female swivel nut with spherical seat

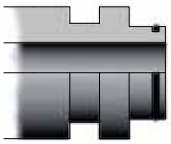
Hydraulink Hose and Fittings

THREAD IDENTIFICATION

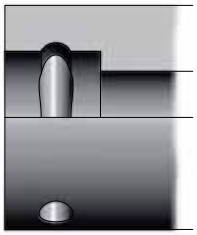
STAPLE-LOK COUPLINGS

Originally designed in Germany for underground mining equipment, the Staple-lok requires no spanners for connection or disconnection. The male and female are pushed together and held with a retaining staple or “U” clip.

Sealing is achieved by the captive “O”-Ring located on the male spigot. The female can either be fixed or swivel type. The coupling is not designed to swivel under pressure.

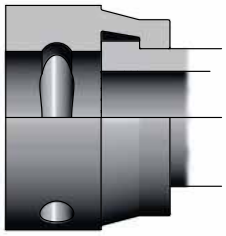


Staple-lok male



Staple-lok fixed female

THREAD SPECIFICATIONS					
Coupling Dash Size	Imperial Size	Male O.D. inch	Male O.D. mm	Female I.D. inch	Female I.D. mm
-4	1/4	0.58	14.8	.59	15.0
-6	3/8	0.78	19.8	.79	20.0
-8	1/2	0.94	23.9	.95	24.1
-12	3/4	1.13	28.8	1.14	29.0
-16	1	1.53	38.9	1.54	39.1
-20	1.1/4	1.80	45.7	1.81	46.0
-24	1.1/2	2.16	54.9	2.17	55.1
-32	2	2.52	64.0	2.53	64.3



Staple-lok swivel female

Staple-lok staple

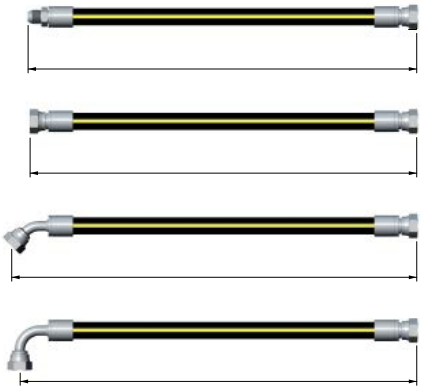
Hydraulink Hose and Fittings

HOSE ASSEMBLY MEASUREMENT

STRAIGHT HOSE ASSEMBLY LENGTH

Overall hose assembly lengths are determined by measuring the centreline length between the coupling end faces for straight couplings, or through the sealing face centreline for angled couplings (examples to right).

Sufficient length allowance should be made to compensate for hose contraction and expansion under operating procedures.



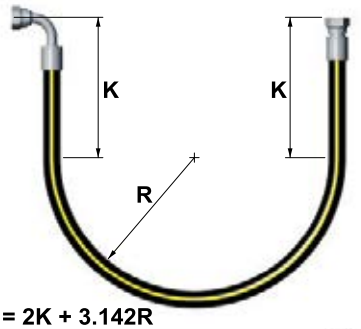
BENT HOSE ASSEMBLY LENGTH

For installations that require a 180° bend in the hose assembly, the overall length can be calculated as follows:

Static Installations

To avoid localised concentration of bending strain on the hose couplings, a free distance (K) of hose should be designed into the length of each assembly. Distance “K” includes length of coupling and adaptor (if used). Dimension “R” should not be less than the manufacturer’s recommended bend radius for the hose used. Refer to chart below for “K” dimensions of hoses with I.D. from 3/16” to 2”.

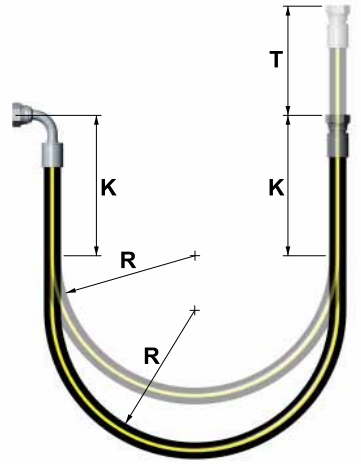
Hose I.D.	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1.1/4	1.1/2	2
K (mm)	110	130	130	160	180	210	210	260	260	260	310



Length = 2K + 3.142R

Dynamic Installations

When a hose assembly is subjected to relative motion between the two end couplings, additional hose length is required to accomodate the travel distance. In the diagram (right) “T” represents the amount of travel.



Length = 2K + 3.142R + T

Off-Set Angle Measurement

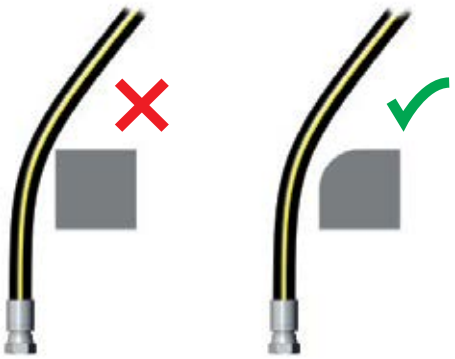
Place hose assembly in line of sight position with coupling furthest away facing upwards. Determine off-set angle by comparing relative position of closest coupling to the far coupling in a clockwise direction.

Hydraulink Hose and Fittings

HOSE INSTALLATION RECOMMENDATIONS

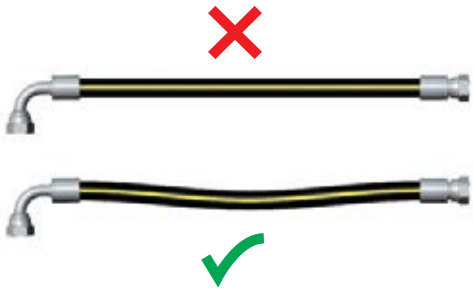
1. Hose Protection
Protect the hose cover from damage such as abrasion, erosion, snagging, and cutting. Where possible, route hose to reduce abrasion from hose rubbing other hose or objects that may abrade it (Fig. 1). Special abrasion-resistant hoses and hose guards are available for additional protection. Special consideration may also need to be given to hose assemblies near heat sources.

Fig. 1



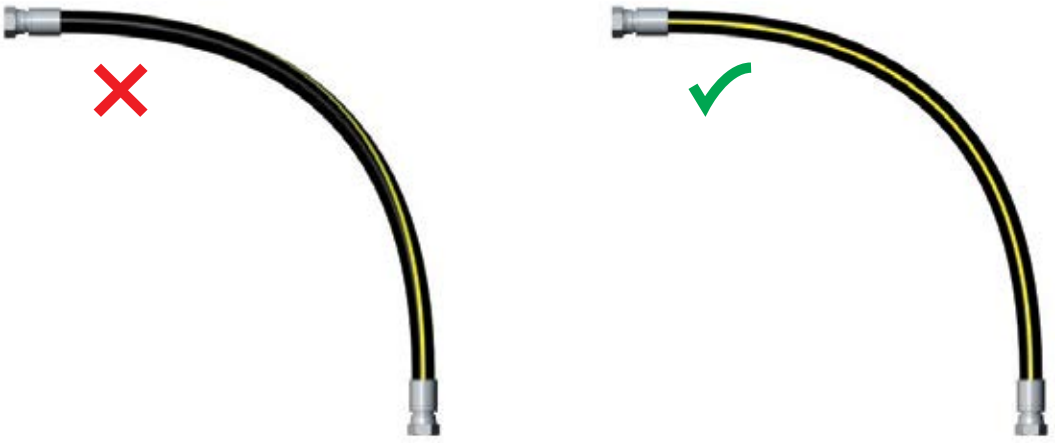
2. Hose And Machine Tolerances
Avoid tension on hose assemblies and adaptors. Design hose to allow for changes in length due to machine motion and tolerances (Fig. 2). Failure to do so may result in seal or assembly failure.

Fig. 2



3. Torsional Twist
Do not transfer torque to hose while installing. This transfer of torque can result in torsional twist, which may result in premature hose assembly failure. Use swivel type couplings or adaptors for ease of alignment as needed to prevent twisting during installation. Use the brand lay-line as a guide to ensure the hose is not pre-loaded with torsional twist when installed (Fig. 3).

Fig. 3



4. Minimum Bend Radius
The minimum bend radius for hose supplied by Hydraulink is detailed in this catalogue. Routing at less than minimum bend radius is not recommended and may reduce hose life.

Prevent sharp bending at the hose/fitting juncture (Fig. 4a). Unnecessary stress at this point may result in leaking, hose rupturing, or the hose assembly blowing apart.

Stress at this point can be minimised by ensuring adequate hose length (Fig. 4b), or by use of angled adaptors and couplings (Fig 4c).

Fig. 4a

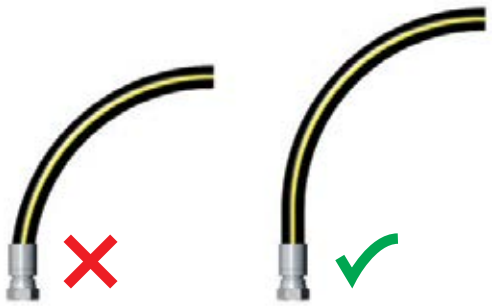


Fig. 4b

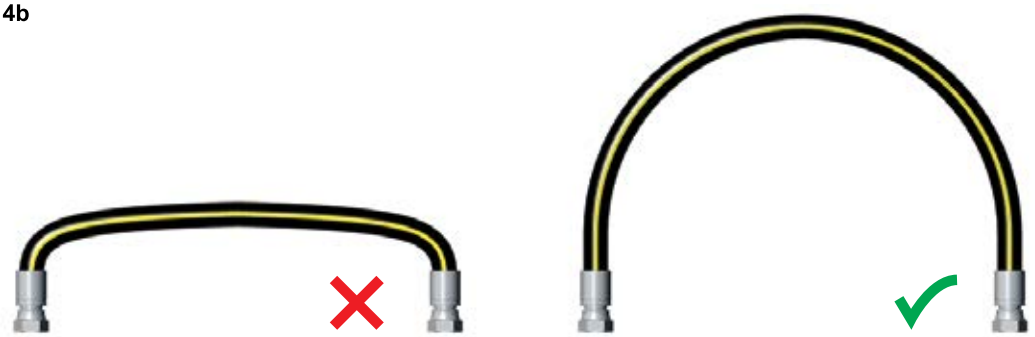


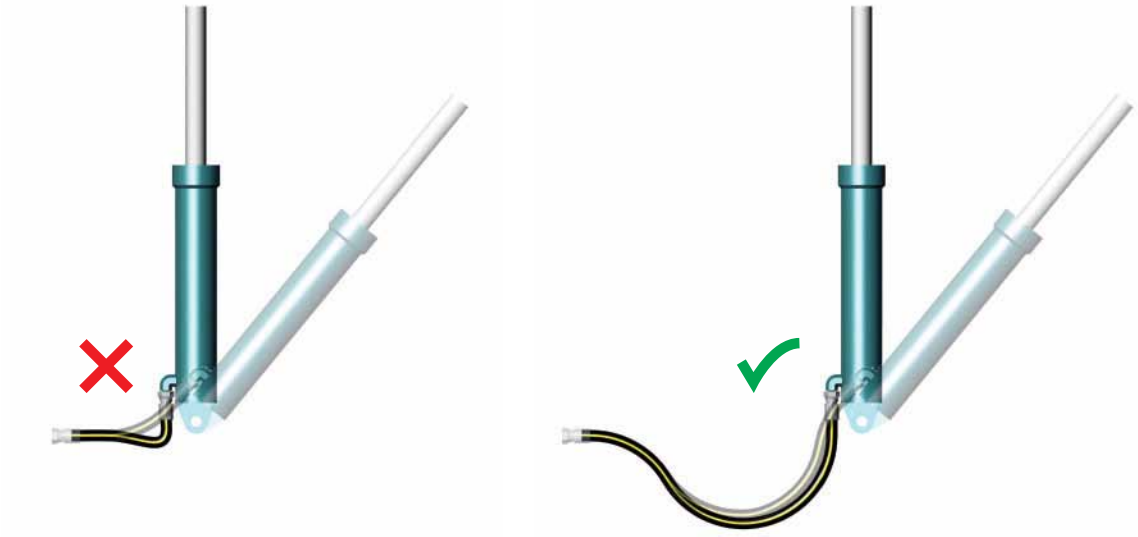
Fig. 4c

5. Hose Length Change
Hydraulic hose can expand longitudinally when pressurised, and this hose length change must be considered when specifying or installing hose assemblies (Fig. 5) When clamping hose lengths, always place clamps to avoid stressing the fitting end.

Fig. 5

6. Relative Movement
When specifying or installing hoses that have movement relative to each other, provide adequate hose length to absorb the required movement and prevent bends occuring that are smaller than the minimum bend radius (Fig. 6a).

Fig. 6a



CAMLOCKS

GPA

TYPE A MALE ADAPTOR - BSP FEMALE
GENERAL PURPOSE

Part Number	Adaptor	BSP
GPA020	20	3/4
GPA025	25	1
GPA032	32	1 1/4
GPA040	40	1 1/2
GPA050	50	2
GPA065	65	2 1/2
GPA080	80	3
GPA100	100	4
GPA150	150	6

GPB

TYPE B FEMALE COUPLER - BSP MALE
GENERAL PURPOSE

Part Number	Coupler	BSP
GPB020	20	1/2
GPB025	25	1
GPB032	32	1 1/4
GPB040	40	1 1/2
GPB050	50	2
GPB065	65	2 1/2
GPB080	80	3
GPB100	100	4
GPB150	150	6

GPC

TYPE C FEMALE COUPLER - HOSE TAIL
GENERAL PURPOSE

Part Number	Coupler	BSP
GPC020	20	3/4
GPC025	25	1
GPC032	32	1 1/4
GPC040	40	1 1/2
GPC050	50	2
GPC065	65	2 1/2
GPC080	80	3
GPC100	100	4
GPC150	150	6

GPD

TYPE D FEMALE COUPLER - BSP FEMALE
GENERAL PURPOSE

Part Number	Coupler	BSP
GPD020	20	3/4
GPD025	25	1
GPD032	32	1 1/4
GPD040	40	1 1/2
GPD050	50	2
GPD065	65	2 1/2
GPD080	80	3
GPD100	100	4
GPD150	150	6

GPDC

TYPE DC DUST CAP
GENERAL PURPOSE

Part Number	Coupler Size
GPDC020	3/4
GPDC025	1
GPDC032	1 1/4
GPDC040	1 1/2
GPDC050	2
GPDC065	2 1/2
GPDC080	3
GPDC100	4
GPDC150	6

GPDP

TYPE DP DUST PLUG
GENERAL PURPOSE

Part Number	Adaptor Size
GPDP020	3/4
GPDP025	1
GPDP032	1 1/4
GPDP040	1 1/2
GPDP050	2
GPDP065	2 1/2
GPDP080	3
GPDP100	4
GPDP150	6

GPE

TYPE E MALE ADAPTOR - HOSE TAIL
GENERAL PURPOSE

Part Number	Adaptor	Hose Tail
GPE020	20	3/4
GPE025	25	1
GPE032	32	1 1/4
GPE040	40	1 1/2
GPE050	50	2
GPE065	65	2 1/2
GPE080	80	3
GPE100	100	4
GPE150	150	6

GPF

TYPE F MALE ADAPTOR - MALE BSP
GENERAL PURPOSE

Part Number	Adaptor	BSP
GPF020	20	3/4
GPF025	25	1
GPF032	32	1 1/4
GPF040	40	1 1/2
GPF050	50	2
GPF065	65	2 1/2
GPF080	80	3
GPF100	100	4
GPF150	150	6

CSSB

SEAL
BUNA - CAMLOCK SEAL

Part Number	Size (mm)
CSSB015	15
CSSB020	20
CSSB025	25
CSSB032	32
CSSB040	40
CSSB050	50
CSSB065	65
CSSB080	80
CSSB100	100
CSSB150	150
CSSB200	200

CSSV

SEAL
VITON - CAMLOCK SEAL

Part Number	Size (mm)
CSSV020	20
CSSV025	25
CSSV032	32
CSSV038	38
CSSV050	50
CSSV065	65
CSSV080	80
CSSV100	100
CSSV150	150

CSPSS

CAMLOCK PIN
STAINLESS STEEL

Part Number	Size (mm)
CSPSS025	25
CSPSS03265	32-65
CSPSS150	150

CSLB

CAMLOCK LEVER
BRASS

Part Number	Size (mm)
CSLB03265	32-65
CSLB080125	80-125
CSLB150200	150-200

SUCTION COUPLINGS

BRMT

BSP MALE HOSE TAIL
BRASS HOSE TAIL

- Applications: Used on hose assemblies in low pressure or suction applications

Part Number	BSP	Hose Tail
BRMT-012	1/2	1/2
BRMT-019	3/4	3/4
BRMT-01912	3/4	1/2
BRMT-025	1	1
BRMT-02512	1	1/2
BRMT-02519	1	3/4
BRMT-032	1 1/4	1 1/4
BRMT-038	1 1/2	1 1/2
BRMT-051	2	2
BRMT-063	2 1/2	2 1.2
BRMT-076	3	3
BRMT-102	4	4

BRNT

BSP FEMALE HOSE TAIL
BRASS HOSE TAIL

- Applications: Used on hose assemblies in low pressure or suction applications

Part Number	BSP	Hose Tail
BRNT-012	1/2	1/2
BRNT-019	3/4	3/4
BRNT-01912	3/4	1/2
BRNT-025	1	1
BRNT-02512	1	1/2
BRNT-02519	1	3/4
BRNT-032	1 1/4	1 1/4
BRNT-038	1 1/2	1 1/2
BRNT-051	2	2
BRNT-063	2 1/2	2 1.2
BRNT-076	3	3
BRNT-102	4	4

PPMT

BSP MALE HOSE TAIL
POLYPROPYLENE HOSE TAIL

- Applications: Used on hose assemblies in low pressure or suction applications

Part Number	BSP	Hose Tail
PPMT-012	1/2	1/2
PPMT-019	3/4	3/4
PPMT-025	1	1
PPMT-032	1 1/2	1 1/2
PPMT-038	1 1/2	1 1/2
PPMT-051	2	2
PPMT-076	3	3

PPNT

BSP FEMALE HOSE TAIL
POLYPROPYLENE HOSE TAIL

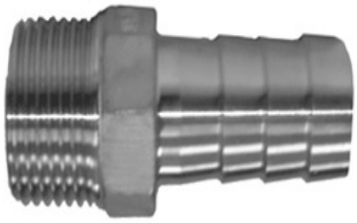
- Applications: Used on hose assemblies in low pressure or suction applications

Part Number	BSP	Hose Tail
PPNT-019	3/4	3/4
PPNT-025	1	1
PPNT-032	1 1/2	1 1/2
PPNT-038	1 1/2	1 1/2
PPNT-051	2	2
PPNT-076	3	3

SSMT

BSP MALE HOSE TAIL
STAINLESS HOSE TAIL

- Applications: Used on hose assemblies in low pressure or suction applications



Part Number	BSP	Hose Tail
SSMT-006	1/4	1/4
SSMT-010	3/8	3/8
SSMT-012	1/2	1/2
SSMT-019	3/4	3/4
SSMT-025	1	1
SSMT-032	1 1/4	1 1/4
SSMT-038	1 1/2	1 1/2
SSMT-051	2	2
SSMT-063	2 1/2	2 1/2
SSMT-076	3	3
SSMT-102	4	4

CNSP

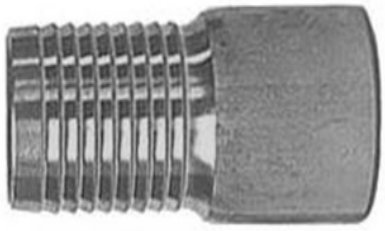
COMBINATION HOSE TAIL BSPTM
STEEL PLATED HOSE TAIL

- Applications: Used in hose assemblies for connection to other outlets. Serrated tail ensures positive grip on hose bore.

Part Number	Size (mm)
CNSP-019	19
CNSP-025	25
CNSP-032	32
CNSP-038	38
CNSP-051	51
CNSP-063	63
CNSP-076	76
CNSP-102	102
CNSP-152	152

CNSBB

COMBINATION HOSE TAIL
BLACK STEEL HOSE TAIL



- Applications: Black steel products are to facilitate the welding onto plate flanges or pipe port flanges to eliminate joins or other outlets.

Part Number	Size (mm)
CNSBB-038	38
CNSBB-051	51
CNSBB-063	63
CNSBB-076	76
CNSBB-102	102
CNSBB-152	152
CNSBB-203	203

HMSP

HOSE MENDER
STEEL HOSE MENDER

- Applications: For the joining of hoses in repair situations.

Part Number	Size (mm)
HMSP-019	19
HMSP-025	25
HMSP-032	32
HMSP-038	38
HMSP-051	51
HMSP-063	63
HMSP-076	76
HMSP-102	102
HMSP-152	152

GJCD103

GROUND JOINT
DUCTILE IRON GROUND JOINT - BSP

- Applications: For low and high pressure steam hose assemblies. The female spuds are fitted with copper seated to ensure sealing on assembly.

Part Number	Size (mm)
GJCDI03-012	12
GJCDI03-019	19
GJCDI03-025	25

CLAW COUPLERS

CACSG03

TYPE A CLAW COUPLER - MALE BSP
SG IRON COUPLING - BSPM THREAD

- Applications: Universal couplings used for the transfer of air and water in industrial/mining/mineral processing sites.

Part Number	Size (mm)
CACSG03-012	12
CACSG03-019	19
CACSG03-025	25

CACSG07

TYPE A CLAW COUPLER - HOSE TAIL
SG IRON COUPLING - HOSETAIL

- Applications: Universal couplings used for the transfer of air and water in industrial/mining/mineral processing sites.

Part Number	Size (mm)
CACSG07-012	12
CACSG07-019	19
CACSG07-025	25

CACSG10

TYPE A CLAW COUPLER - FEMALE BSP
SG IRON COUPLING - BSPF THREAD

- Applications: Universal couplings used for the transfer of air and water in industrial/mining/mineral processing sites.

Part Number	Size (mm)
CACSG10-012	12
CACSG10-019	19
CACSG10-025	25

BC2

2 BOLT CLAW CLAMP
DUCTILE IRON HEAVY DUTY CLAMP

- Material specifications:
- Ductile Iron
- Applications: Heavy duty clamp designed for the retention of couplings with locking collars. Used for high pressure air lines or steam hose.

Part Number	Size (mm)	Hose I.D (mm)
BC215027	23.8-26.9	15
BC220033	30.1-33.3	20
BC220038	33.3-38.1	20
BC220043	38.1-42.8	20

CACSPD

CLIP
CLAW COUPLER CLIP

Part Number	Size (mm)
CACSPD-01076	76

NOZZLES

PPNJ

POWERJET NOZZLE
BRASS VALVE - BSPF THREAD

- Applications: General washdown in dairy/marine/industrial/mining/horticulture industries. Lightweight construction with interchangeable hose tails for varying hose sizes.
- Material specifications: Polycarbonate Polymer.
- Flow rate: 275 LPM.

Part Number	Size (BSP)
PPNJ-025	1
PPNJ-038	1 1/2

PPNJA

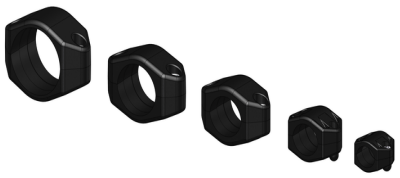
POWERJET HOSE TAIL

- Applications: Used in conjunction with Powerjet Nozzle.

Part Number	Size (BSP)	Hose I.D (mm)
PPNJA-2519	1	19
PPNJA-2525	1	25
PPNJA-3819	1 1/2	19
PPNJA-3825	1 1/2	25
PPNJA-3832	1 1/2	32
PPNJA-3838	1 1/2	38

PNHC

POWERJET HOSE CLAMP
NYLON 6



- Applications: Specially designed to compliment the Powerjet and Fire Hose Nozzles.
- These clamps offer a safer handling option over a Worm Drive Clamp.

Part Number	Hose I.D (mm)
PNHC-019	19
PNHC-025	25
PNHC-032	32
PNHC-038	38

WS44GU-S

WASHDOWN NOZZLE
INDUSTRIAL

- Applications: Industrial and general purpose washdown nozzles for use in dairy, marine, industrial, mining and horticultural industries. Commonly seen on concrete trucks and used in vehicle washdown bays.

Part Number	Size (BSP)
IND-WS44UG-S	3/4

DEWATERING PRODUCTS

BCRRS

SEAL
BAUER O-RING SEAL

- Temperature: -40°C to +100°C
- Material: NBR Rubber

Part Number	Size (mm)
BCRRS-076	76
BCRRS-102	102
BCRRS-152	152
BCRRS-203	203

BCSGFFD

HOSE TAIL FEMALE
FLANGED TABLE D

- Applications: Suction and delivery hoses used for transferring water/slurries/powders/sewerage/granules in irrigation/mining/industrial areas. System allows for 30° articulation at joint when installing. Can handle medium levels of vacuum and working pressures up to 20 bar.

Part Number	Size (mm)
BCSGFFD-076	76
BCSGFFD-102	102
BCSGFFD-152	152
BCSGFFD-203	203

BCSGFMD

HOSE TAIL MALE
FLANGED TABLE D

- Applications: Suction and delivery hoses used for transferring water/slurries/powders/sewerage/granules in irrigation/mining/industrial areas. System allows for 30° articulation at joint when installing. Can handle medium levels of vacuum and working pressures up to 20 bar.

Part Number	Size (mm)
BCSGFMD-076	76
BCSGFMD-102	102
BCSGFMD-152	152
BCSGFMD-203	203

BCSGHF

HOSE TAIL FEMALE
FEMALE BAUER HOSE TAIL

- Applications: Suction and delivery hoses used for transferring water/slurries/powders/sewerage/granules in irrigation/mining/industrial areas. System allows for 30° articulation at joint when installing. Can handle medium levels of vacuum and working pressures up to 20 bar.

Part Number	Size (mm)
BCSGHF-076	76
BCSGHF-102	102
BCSGHF-152	152
BCSGHF-203	203

BCSGHM

HOSE TAIL MALE
MALE BAUER HOSE TAIL

- Applications: Suction and delivery hoses used for transferring water/slurries/powders/sewerage/granules in irrigation/mining/industrial areas. System allows for 30° articulation at joint when installing. Can handle medium levels of vacuum and working pressures up to 20 bar.

Part Number	Size (mm)
BCSGHM-076	76
BCSGHM-102	102
BCSGHM-152	152
BCSGHM-203	203

BCSGL

LOCKING LEVER
BAUER LOCKING LEVER

- Material: Galvanised Steel

Part Number	Size (mm)
BCSGL-076	76
BCSGL-102	102
BCSGL-152	152
BCSGL-203	203

PNEUMATIC COUPLERS

QA210

ARO 210 INTERCHANGE
HOSE BARB COUPLING

- Temperature range: -20°C to + 100°C (-4°F to +212°F)
- Working pressure: 0 to 35 bar (0 to 508 psi)
- Flow capacity: NW - 5
- Material: Coupler body, Sleeve, Valve: Brass
- Spring, Pins: Stainless steel
- Seals: Nitrile
- Plug: Steel
- Applications: Robust brass coupling with numerous connection options. Preferred application is the compressed air technology industry.
- Also particularly suited to use with water due to the brass valve.
- Interchangeability: TST 022, Rectus 14 & 22, ARO 210, Parker 50, Cejn 300, Orion 44150, JWL 522 & 532

Part Number	Hose Tail
QA210-04	1/4
QA210-05	5/16
QA210-08	1/2

QA210-SL

ARO 210 INTERCHANGE
HOSE BARB COUPLING WITH SAFETY LOCK

- Temperature range: -20°C to + 100°C (-4°F to +212°F)
- Working pressure: 0 to 35 bar (0 to 508 psi)
- Flow capacity: NW - 5.5
- Material: Inner part: Aluminium
- Back part: Brass - Nickel plated
- Valve: Steel - Chrome plated
- Spring: Stainless steel
- Coupler body: Steel - Chrome plated
- Seals: Nitrile
- Balls: AISI 420 hardened
- Push button: AISI 420 hardened
- Applications: Preferred application is the compressed air technology industry.
- Interchangeability: TST 014 & 022, ARO 210, Rectus 14 & 22, Industrial interchange 1/4, Orion 44510, Cejn 300, JWL 522 & 532, DynaQuip DM-2, Aeroquip FD41, Gromelle G-16600

Part Number	Hose Tail
QA210-04SL	1/4
QA210-06SL	3/8
QA210-08SL	1/2

QA210-E

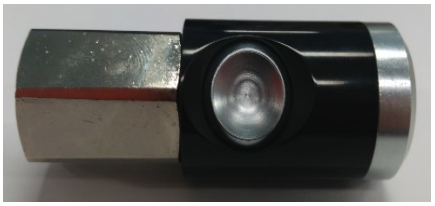
ARO 210 INTERCHANGE
FEMALE THREAD COUPLING

- Temperature range: -20°C to + 100°C (-4°F to +212°F)
- Working pressure: 0 to 35 bar (0 to 508 psi)
- Flow capacity: NW - 5
- Material: Coupler body, Sleeve, Valve: Brass
- Spring, Pins: Stainless steel
- Seals: Nitrile
- Plug: Steel
- Applications: Robust brass coupling with numerous connection options. Preferred application is the compressed air technology industry.
- Also particularly suited to use with water due to the brass valve.
- Interchangeability: TST 022, Rectus 14 & 22, ARO 210, Parker 50, Cejn 300, Orion 44150, JWL 522 & 532

Part Number	BSPF
QA210-E04	1/4
QA210-E06	3/8
QA210-E08	1/2

QA210-E SL

ARO 210 INTERCHANGE
FEMALE THREAD COUPLING WITH SAFETY LOCK

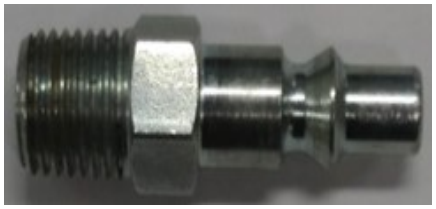


- Temperature range: -20°C to + 100°C (-4°F to +212°F)
- Working pressure: 0 to 35 bar (0 to 508 psi)
- Flow capacity: NW - 5.5
- Material: Inner part: Aluminium
- Back part: Brass - Nickel plated
- Valve: Steel - Chrome plated
- Spring: Stainless steel
- Coupler body: Steel - Chrome plated
- Seals: Nitrile
- Balls: AISI 420 hardened
- Push button: AISI 420 hardened
- Applications: Preferred application is the compressed air technology industry.
- Interchangeability: TST 014 & 022, ARO 210, Rectus 14 & 22, Industrial interchange 1/4, Orion 44510, Cejn 300, JWL 522 & 532, DynaQuip DM-2, Aeroquip FD41, Gromelle G-16600

Part Number	BSPF
QA210-E04SL	1/4
QA210-E06SL	3/8
QA210-E08SL	1/2

MALE THREAD PLUG

ARO 210 INTERCHANGE
MALE THREAD PLUG



- Temperature range: -20°C to + 100°C (-4°F to +212°F)
- Working pressure: 0 to 35 bar (0 to 508 psi)
- Flow capacity: NW - 5
- Material: Coupler body, Sleeve, Valve: Brass
- Spring, Pins: Stainless steel
- Seals: Nitrile
- Plug: Steel
- Applications: Robust brass coupling with numerous connection options. Preferred application is the compressed air technology industry.
- Also particularly suited to use with water due to the brass valve.
- Interchangeability: TST 022, Rectus 14 & 22, ARO 210, Parker 50, Cejn 300, Orion 44150, JWL 522 & 532

Part Number	BSPTM
QA2608	1/4
QA2700	3/8
QA300405	1/2

HOSE BARB PLUG

ARO 210 INTERCHANGE
HOSE BARB PLUG

- Temperature range: -20°C to + 100°C (-4°F to +212°F)
- Working pressure: 0 to 35 bar (0 to 508 psi)
- Flow capacity: NW - 5
- Material: Coupler body, Sleeve, Valve: Brass
- Spring, Pins: Stainless steel
- Seals: Nitrile
- Plug: Steel
- Applications: Robust brass coupling with numerous connection options. Preferred application is the compressed air technology industry.
- Also particularly suited to use with water due to the brass valve.
- Interchangeability: TST 022, Rectus 14 & 22, ARO 210, Parker 50, Cejn 300, Orion 44150, JWL 522 & 532

Part Number	Hose Tail
QA3946	1/4
QA3947	5/16
QA3948	3/8

PBG-TS13

PNEUMATIC BLOW GUN
STANDARD NOZZLE

- Material Specifications: Impact resistant plastic with brass threaded connection.

Part Number	Description
PBG-TS13	STANDARD NOZZLE

BANDIMEX

TW001

BANDIMEX HAND TOOL

- For Tightening And Cutting Of Bandimex Banding.

Part Number
TW001

TV001

BANDIMEX HAND TOOL ADAPTOR
STANDARD ADAPTOR

- For Tightening And Cutting Of Bandimex Pre-formed Clamps.

Part Number
TV001

TV050

BANDIMEX HAND TOOL ADAPTOR
HEAVY DUTY ADAPTOR

- For Tightening And Cutting Of Bandimex Pre-formed Clamps.

Part Number
TV050

W4BB2

BANDIMEX BAND

- Material Specifications: Stainless Steel Grade 304
- Applications: Versatile and mobile system allowing the connection to Hose pipes/Cables/Boards etc. using selected size band and buckle. Assembly with hand tool either in factory or out in the field

Part Number	Width (mm)	Thickness (mm)
W4BB203	9.5	0.64
W4BB204	12.7	0.75
W4BB205	15.9	0.75

W4BS2

BANDIMEX BUCKLE

- Material Specifications: Stainless Steel Grade 304
- Applications: Versatile and mobile system allowing the connection to Hose pipes/Cables/Boards etc. using selected size band and buckle. Assembly with hand tool either in factory or out in the field

Part Number	Width (mm)	Thickness (mm)
W4BS253	9.5	0.64
W4BS254	12.7	0.75
W4BS255	15.9	0.75
W4BS256	19.1	0.75

W4BV2

PRE-FORM CLAMPS
STAINLESS STEEL HOSE CLAMP

- Material Specifications: Stainless Steel Grade 304
- Applications: A quicker method of clamping hose assemblies. Just place the clamp over the open end of the hose and tighten with the hand tool either in the factory or out in the field.

Part Number	Clamp ID (mm)	Band Width
W4BV201	20.6	9.5
W4BV202	34.9	9.5
W4BV203	25.4	12.7
W4BV204	38.1	12.7
W4BV205	38.1	15.9
W4BV206	44.5	15.9
W4BV207	50.8	15.9
W4BV208	57.2	15.9
W4BV209	63.5	15.9
W4BV210	69.9	19.1
W4BV211	76.2	19.1
W4BV212	88.9	19.1
W4BV213	101.6	19.1
W4BV214	114.3	19.1
W4BV215	127	19.1
W4BV216	152.4	19.1
W4BV218	177.8	19.1
W4BV230	69.9	12.7
W4BV231	88.9	12.7
W4BV236	44.5	12.7
W4BV241	34.9	6.4
W4BV243	25.4	9.5
W4BV245	47.6	9.5

SUPER CLAMPS

W1CS

NORMA GBS
MILD STEEL HOSE CLAMP

- Material specifications:
- W1: Band/housing/screw are mild steel; Clear chromate
- Applications: Heavy duty hose clamp where high force is placed on the clamp when fixing to pressure and suction hoses. The mechanical interlock of the band/housing/solid bridge and specially designed bolt all combine to offer an all round stronger product with higher torque abilities.
- Conforming standard: DIN 3017

Part Number	Range (mm)	Band Width	Screw Head
W1CS019	17-19	18	8
W1CS021	19-21	18	8
W1CS023	21-23	18	8
W1CS025	23-25	18	8
W1CS028	25-27	18	8
W1CS031	29-31	18	8
W1CS035	31-34	18	8
W1CS039	34-37	18	8
W1CS041	37-40	18	8
W1CS043	40-43	18	8
W1CS047	43-47	20	10
W1CS051	47-51	20	10
W1CS055	51-55	20	10
W1CS059	55-59	20	10
W1CS063	59-63	20	10
W1CS067	63-68	20	10
W1CS073	68-73	25	13
W1CS079	73-79	25	13
W1CS085	79-85	25	13
W1CS091	85-91	25	13
W1CS097	91-97	25	13
W1CS103	97-104	25	13
W1CS112	104-112	25	13
W1CS121	112-121	25	13
W1CS130	121-130	25	13
W1CS139	130-140	30	17
W1CS148	140-150	30	17
W1CS161	150-162	30	17
W1CS174	162-174	30	17
W1CS187	174-187	30	17
W1CS200	187-200	30	17

W1CS213	200-213	30	17
W1CS226	213-226	30	17
W1CS239	226-239	30	17
W1CS252	239-252	30	17

W2CS

NORMA GBS
STAINLESS STEEL HOSE CLAMP

- Material specifications:
- W2: Band/housing are stainless steel grade 430 and screw is mild steel zinc plated
- Applications: Heavy duty hose clamp where high force is placed on the clamp when fixing to pressure and suction hoses. The mechanical interlock of the band/housing/solid bridge and specially designed bolt all combine to offer an all round stronger product with higher torque abilities.
- Conforming standard: DIN 3017

Part Number	Range (mm)	Band Width	Screw Head
W2CS019	17-19	18	8
W2CS021	19-21	18	8
W2CS023	21-23	18	8
W2CS025	23-25	18	8
W2CS028	25-27	18	8
W2CS031	29-31	18	8
W2CS035	31-34	18	8
W2CS039	34-37	18	8
W2CS041	37-40	18	8
W2CS043	40-43	18	8
W2CS047	43-47	20	10
W2CS051	47-51	20	10
W2CS055	51-55	20	10
W2CS059	55-59	20	10
W2CS063	59-63	20	10
W2CS067	63-68	20	10
W2CS073	68-73	25	13
W2CS079	73-79	25	13
W2CS085	79-85	25	13
W2CS091	85-91	25	13
W2CS097	91-97	25	13
W2CS103	97-104	25	13
W2CS112	104-112	25	13
W2CS121	112-121	25	13

W2CS130	121-130	25	13
W2CS139	130-140	30	17
W2CS148	140-150	30	17
W2CS161	150-162	30	17
W2CS174	162-174	30	17
W2CS187	174-187	30	17
W2CS200	187-200	30	17
W2CS213	200-213	30	17

W4CS

NORMA GBS
STAINLESS STEEL HOSE CLAMP

- Material specifications:
- W4: Band housing and screw are stainless steel grade 304
- Applications: Heavy duty hose clamp where high force is placed on the clamp when fixing to pressure and suction hoses. The mechanical interlock of the band/housing/solid bridge and specially designed bolt all combine to offer an all round stronger product with higher torque abilities.
- Conforming standard: DIN 3017

Part Number	Range (mm)	Band Width	Screw Head
W4CS019	17-19	18	8
W4CS021	19-21	18	8
W4CS023	21-23	18	8
W4CS025	23-25	18	8
W4CS028	25-27	18	8
W4CS031	29-31	18	8
W4CS035	31-34	18	8
W4CS039	34-37	18	8
W4CS041	37-40	18	8
W4CS043	40-43	18	8
W4CS047	43-47	20	10
W4CS051	47-51	20	10
W4CS055	51-55	20	10
W4CS059	55-59	20	10
W4CS063	59-63	20	10
W4CS067	63-68	20	10
W4CS073	68-73	25	13
W4CS079	73-79	25	13
W4CS085	79-85	25	13
W4CS091	85-91	25	13

W4CS097	91-97	25	13
W4CS103	97-104	25	13
W4CS112	104-112	25	13
W4CS121	112-121	25	13
W4CS130	121-130	25	13
W4CS139	130-140	30	17
W4CS148	140-150	30	17
W4CS161	150-162	30	17
W4CS174	162-174	30	17
W4CS187	174-187	30	17
W4CS200	187-200	30	17
W4CS213	200-213	30	17
W4CS226	213-226	30	17
W4CS239	226-239	30	17
W4CS252	239-252	30	17

WORM DRIVE CLAMPS

W3CWB

TORRO
STAINLESS STEEL HOSE CLAMP

- Material specifications: W3: Band/housing/screw are stainless steel grade 430
- Applications: A multi-application hose clamp used in industrial/marine/agricultural/automotive/mining industries. The pressed tooth form and the rounded raised edges prevent damage to the hose.
- Conforming Standard: DIN 3017

Part Number	Range (mm)	Band Width	Screw Head
W3CWB016	8-16	9.0	7
W3CWB022	12-20	9.0	7

W3CWC

TORRO

STAINLESS STEEL HOSE CLAMP

- Material specifications: W3: Band/housing/screw are stainless steel grade 430
- Applications: A multi-application hose clamp used in industrial/marine/agricultural/automotive/mining industries. The pressed tooth form and the rounded raised edges prevent damage to the hose.
- Conforming Standard: DIN 3017

Part Number	Range (mm)	Band Width	Screw Head
W3CWC027	16-27	12.0	7
W3CWC032	20-32	12.0	7
W3CWC040	25-40	12.0	7
W3CWC045	30-45	12.0	7
W3CWC050	35-50	12.0	7
W3CWC060	40-60	12.0	7
W3CWC070	50-70	12.0	7
W3CWC080	60-80	12.0	7
W3CWC090	70-90	12.0	7
W3CWC100	80-100	12.0	7
W3CWC110	90-110	12.0	7
W3CWC120	100-120	12.0	7
W3CWC130	110-130	12.0	7
W3CWC140	120-140	12.0	7
W3CWC150	130-150	12.0	7
W3CWC160	140-160	12.0	7
W3CWC170	150-170	12.0	7
W3CWC180	160-180	12.0	7
W3CWC200	180-200	12.0	7
W3CWC230	210-230	12.0	7

PIPE RETAINING CLAMPS

PCR

HD RUBBER LINED
W1 HIGH CARBON STEEL

- Material specifications: W1: Band/Rubber lined cover
- Applications: Pipe retaining clips (P Clips) are the ideal retaining elements for pipes, cables, cable harnesses, cable protection pipes, hoses and other applications.
- Features: 10 & 13mm mounting hole sizes
- Form fitting and adjustable band for ease of assembly and safe attachment
- Reinforced band ends prevent the clip from tearing or loosening in cases where there is high mechanical load

Part Number	Clamp Dia (mm)	Band Width (mm)	Mounting Hole (mm)
PCR-091016	9	16	10
PCR-101016	10	16	10
PCR-131319	13	19	13
PCR-161016	16	16	10
PCR-161319	16	19	13
PCR-191319	19	19	13
PCR-221319	22	19	13
PCR-251019	25	19	10
PCR-251319	25	19	13
PCR-321319	32	19	13
PCR-361319	36	19	13
PCR-381319	38	19	13
PCR-431319	43	19	13
PCR-471319	47	19	13
PCR-511319	51	19	13
PCR-641319	64	19	13

OETIKER CLAMP

OT1S

167 SERIES STEPLESS EAR CLAMP
STAINLESS STEEL HOSE CLAMP

- Material specifications: PG 167 Stainless Steel, Material no. 1.4301/UNS S30400
- Assembly Recommendations: The clamp ear is deformed with a constant tool jaw force, this practice is referred to as force priotity closure. This assembly method ensures that a uniform and repeatable stress is applied to the joint in addition to a consistant tensile force on the clamp interlock. Employing this methodology when closing a 167 series clamp will compensate for ant component tolerence variations, and ensure that the clamp applies a constant radial force to the application.
- Features: Narrow band: concentrates transmission of clamping force
- Stepless over 360°: uniform compression or uniform surface pressure
- Burr-free strip edges: reduced risk of damage to parts being clamped.

Part Number	Range (mm)	Band Width (mm)	Ear Width Inside (mm)
OT1S-1013	10.8 - 13.3	7	8
OT1S-1316	13.2 - 15.7	7	8
OT1S-1418	14.6 - 17.8	7	10
OT1S-1721	17.8 - 21	7	10