

STEAM HEATERS

UPL steam operated heaters provide a simple, economic and noiseless solution to produce hot water in production plants. Simply connect the mixer inlet to the cold water and steam lines to have a ready supply of hot sanitary water for your cleaning operations. This heating process is extremely efficient, cost-saving and needs no stock as it provides the volume of hot water your need. Two inlet valves allow to adjust the temperature which can be read on the thermometer placed in the mixer front.

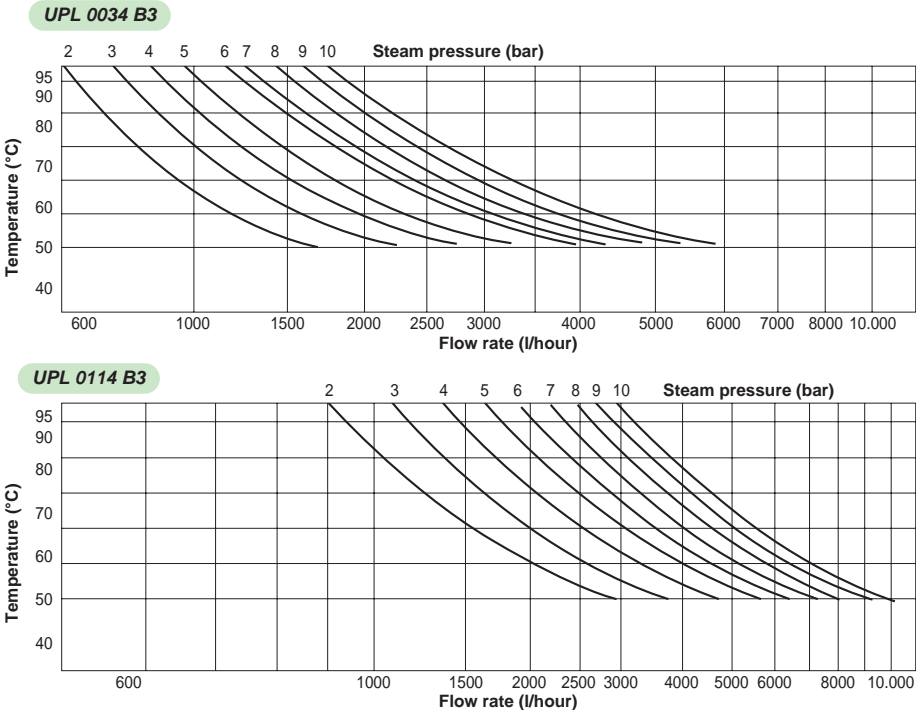
- Thread size 3/4", 1 1/4"
 - Thread specification BSP, NPT
 - Max operating temperature LT 90°C
 - Max steam pressure LP 10 bar
 - Materials B2 AISI 304 Stainless steel
- Typical applications food, chemical and paper industry

Code	RFW inch	RFS inch	UF inch	H mm	H1 mm	L mm	W kg
UPL 0034 xx	3/4"	3/4"	3/4"	356	183	136	4.7
UPL 0114 xx	1 1/4"	1 1/4"	1 1/4"	530	275	196	15.7

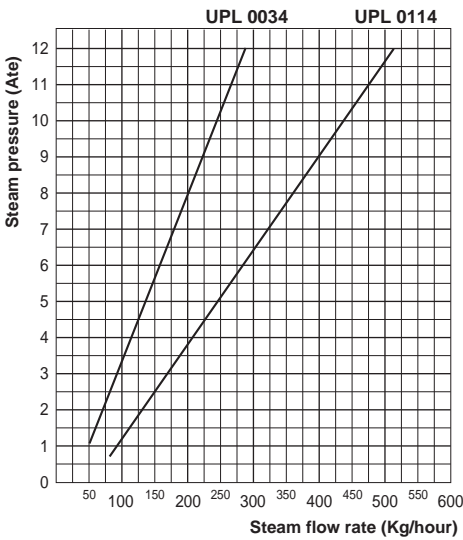
- Steam inlet
Globe valve PN25, with metal sealing seat.
Max temperature 180°C
Max working pressure 12 bar
- Water inlet
Globe valve PN16, with metal sealing or PTFE seat.

The tables below give capacity of hot water (l/hour) for inlet water temperature of 15°C, as a function of steam pressure.

PRESSURE / CAPACITY AT WATER TEMPERATURE = 15°C

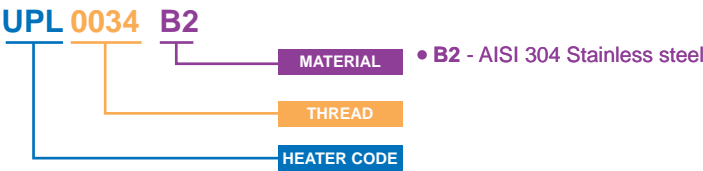


STEAM CONSUMPTION CHART



HOW TO MAKE UP THE PRODUCT CODE

EX.: UPL 0034 B2





UMU AD20 B2HSB
Spray gun is not included

UMU A/B - MANUAL REWIND HOSE REELS

UMU A/B models are basic manual rewind hose reels. The hose can be pull out to the desired length, oriented for release and safely returned into initial position after use. It can be assembled on a mobile cart or fixed to floor, wall or ceiling. Its construction is industrial grade, it's safe for operators, wear-resistant, and leak-free. They are specially designed for swivel nozzles and can be customized in length, materials, operating pressure and temperature to satisfy your requirements.

■ Typical applications	food factories, washing lines, car wash
■ Inlet thread size	1/2", 1"
■ Outlet thread size	1/2", 1"
■ Flexible hose size	3/8", 1/2", 1"
■ Max hose length	70 M
■ Max working pressure	LP 200 bar
■ Material Body	B2 AISI 304 Stainless steel

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU BF10 B2LSB	20	1"	1"	20	1"	10	12	500	460	270	on request
UMU BF20 B2LSB					1"	20	13	500	460	340	
UMU AC20 B2HSB	200	1/2"	1/2"	10	3/8"	20	9	390	330	300	
UMU AD20 B2HSB					1/2"	20					
UMU BC50 B2HSB					3/8"	50	12	500	460	270	
UMU BD35 B2HSB					1/2"	35					
UMU BC70 B2HSB					3/8"	70	13	500	460	340	
UMU BD50 B2HSB					1/2"	50					

UMU G / H (AUTO - REWIND HOSE REELS)



UMU HD20 B2HSB

UMU G/H - AUTO-REWIND HOSE REELS

UMU G/H models are auto-rewind hose reels with multi-position release, very useful and practical for frequent cleaning operations. The hose can be easily pulled out from the reel for the desired length and locked in place during use. When washing is completed, a short further pull activates a spring powered automatic rewind mechanism that returns the hose onto the reel. It's suitable for a variety of industrial environments, wear-resistant, robust in construction and designed to mount floor, wall, ceiling or cart.

■ Typical applications	food factories, washing lines, car wash
■ Inlet thread size	1/2", 1"
■ Outlet thread size	1/2", 1"
■ Flexible hose size	3/8", 1/2", 3/4", 1"
■ Max hose length	20 M
■ Max working pressure	LP 200 bar
■ Material Body	B2 AISI 304 Stainless steel

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU HE13 B2LSB	20	1"	1"	20	3/4"	13	18	530	550	300	XUM US20 B2
UMU HF08 B2LSB					1"	8	18				
UMU HE18 B2LSB	20	1"	1"	20	3/4"	18	24	530	550	480	XUM US22 B2
UMU HF15 B2LSB					1"	15	24				
UMU GD15 B2HSB	200	1/2"	1/2"	10	1/2"	15	13	550	430	230	XUM US15 B2
UMU GD20 B2HSB					1/2"	20	18	550	430	260	XUM US20 B2
UMU HC20 B2HSB					3/8"	20	18	530	550	300	
UMU HD20 B2HSB					1/2"	20	18	530	550	300	

UMU L/K - AUTO-REWIND ADJUSTABLE HOSE REELS

UMU L/K models are hose reels with spring powered automatic rewind and adjustable release, suitable for industrial environments requiring efficient cleaning power. They provide quick hose direction and retraction, are wear-resistant, leak-free and handy to use. The hose can be pulled to the desired length and locked in place during use. When operation is completed, a short further pull activates a spring powered automatic rewind mechanism that returns the hose onto the reel.

UMU L/K hose reels are specially designed for swivel nozzles and can be customized in length, materials, operating pressure and temperature to satisfy your requirements.

■ Typical applications	food factories, washing lines, car wash
■ Inlet thread size	1/2", 1"
■ Outlet thread size	1/2", 1"
■ Flexible hose size	1/2", 3/4", 1"
■ Max hose length	20 M
■ Max working pressure	LP 200 bar
■ Material Body	B2 AISI 304 Stainless steel

**UMU KD20 B2HSB**

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU LE13 B2LSB	20	1"	1"	20	3/4"	13	18	530	550	300	XUM US20 B2
UMU LF08 B2LSB					1"	8	18				
UMU LE18 B2LSB	20	1"	1"	20	3/4"	18	24	530	550	480	XUM US22 B2
UMU LF15 B2LSB					1"	15	24				
UMU KD15 B2HSB	200	1/2"	1/2"	10	1/2"	15	13	500	480	250	XUM US15 B2
UMU KD20 B2HSB						20	18	500	480	280	XUM US20 B2

(LARGE CAPACITY AUTO - REWIND HOSE REELS) **UMU J / I****UMU J/I - LARGE CAPACITY AUTO-REWIND HOSE REELS**

UMU J/I large capacity auto-rewind hose reels are recommended for working environments requiring a large capacity. UMU J/I reels have been designed to hold flexible and long hoses up to 40 meters (depending on hose diameter), and have a double retraction spring that ensure a quick and reliable hose auto-rewinding.

They are robust, wear-resistant, leak-free, powerful and adjustable. Ideal to clean long tunnels or machines from a single water feed point. They can be customized in length, materials, operating pressure and temperature to satisfy your requirements.

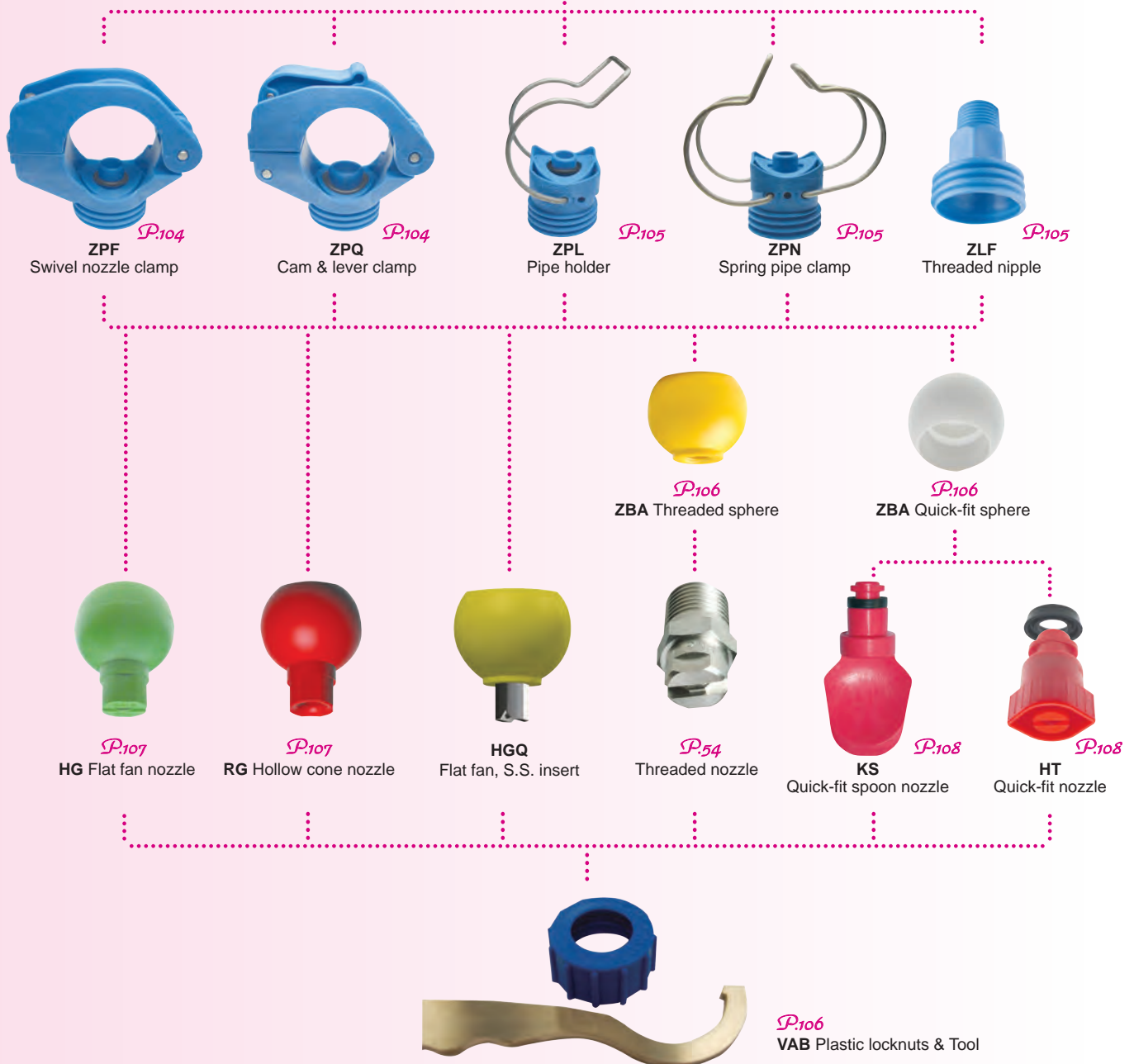
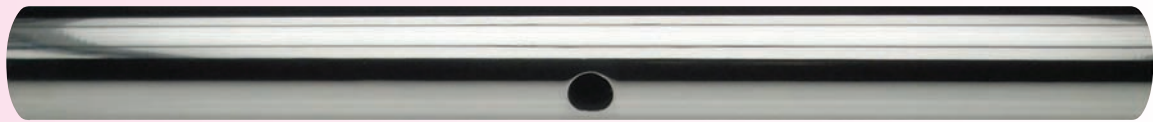
■ Typical applications	food factories, washing lines, car wash
■ Inlet thread size	1/2", 1"
■ Outlet thread size	1/2", 1"
■ Flexible hose size	3/8", 1/2", 3/4", 1"
■ Max hose length	40 M
■ Max working pressure	LP 200 bar
■ Material Body	B2 AISI 304 Stainless steel

**UMU ID40 B2HSB**
Spray gun is not included.

Code	LP bar	E inch	U inch	DI mm	MF inch	LF m	W kg	DE mm	H mm	S mm	Swivel code
UMU JE30 B2LSB	20	1"	1"	20	3/4"	30	40	530	550	520	Please contact our sales
UMU JF25 B2LSB				20	1"	25					
UMU ID25 B2HSB	200	1/2"	1/2"	10	1/2"	25	26	530	550	370	
UMU IC40 B2HSB				10	3/8"	40	36				
UMU ID40 B2HSB				10	1/2"	40	36	530	550	420	

CLIP-ON NOZZLES

Diversified manufacturing is a competitiveness key-factor today. PNR Italy manufactures several diversified products to meet all costumers' needs and help them achieve their production targets. Its complete product range includes clip-on nozzles which now widely used by European and American automobile manufacturers. In the automobile industry the coating lines and 3C lines are representative of diversified production requiring timely adjustments of nozzles spray direction and coverage. Moreover, in such operating environments, nozzles must be regularly cleaned and serviced to ensure high quality coating. To satisfy such requirements PNR has developed cutting-edge quality products to enhance the productivity and competitiveness of the production plant. PNR clip-on adjustable nozzles, made with innovative design and in top quality materials, shorten installation, adjustment and servicing times to the benefit of production efficiency. These nozzles are installed on pipes and can be rapidly released and changed at any time or easily adjusted to different production conditions. PNR clip-on nozzles fully comply with below specifications.



SWIVEL NOZZLE CLAMPS

ZPF swivel clamps are specially designed for HGQ, RGN and ZBA series. To install them on pipes all you need is drill a hole, insert the nozzle clamp inside and fasten it with a simple screwdriver. The nozzle clamp body is in PP chemically bonded fiberglass whereas accessorail bolts and screws are made in stainless steel AISI 316. They are robust, easy to install, adjust and service and their design revolutioned modern surface pre-treatment plants. They provide excellent performance at high temperatures and easy spray jet orientation.

- Typical application

■ Max working temperature

■ Max working pressure

■ Materials
- Cleaning equipment used in pre-treatment for coating process

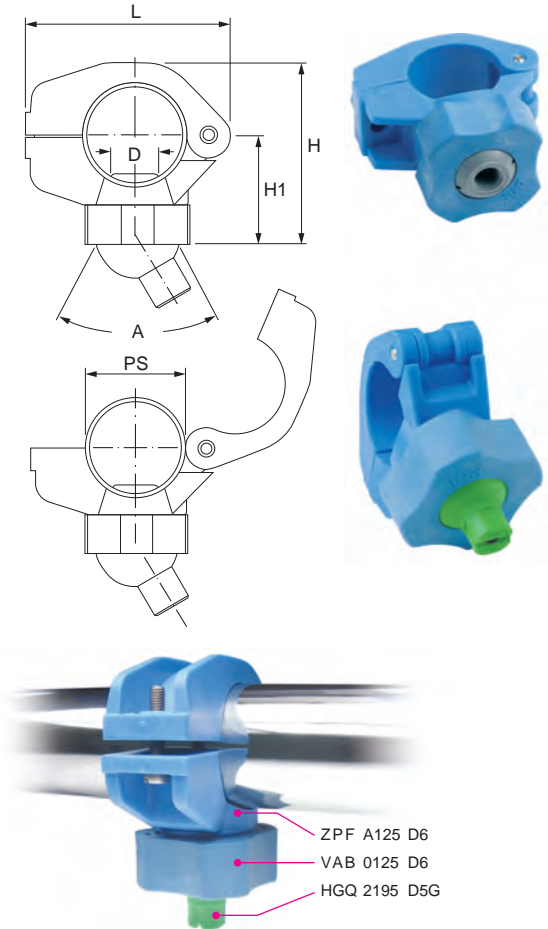
LT 80°C

LP 5 bar

Body D6 PP, chemically bonded fiberglass
Pin & bolt B3 AISI 316 Stainless steel
O-ring E8 NBR

Code	PS inch	PD mm	D mm	H mm	H1 mm	L mm	A deg	W g
ZPF A125 D6	1 1/4"	41/43	20.0	83	54	84	40°	85
ZPF B125 D6			17.0					
ZPF C125 D6			14.0					
ZPF A150 D6	1 1/2"	46/49	20.0	90	57	90	40°	88
ZPF B150 D6			17.0					
ZPF C150 D6			14.0					

HOW TO MAKE UP THE PRODUCT CODE EX.: ZPF A125 D6



CLIP-ON NOZZLES

(SWIVEL NOZZLE CAM AND LEVER CLAMPS) ZPQ

SWIVEL NOZZLE CAM AND LEVER CLAMPS

ZPQ cam and lever clamps are specially designed for HGQ, RGN and ZBA ball nozzles. Only three steps to install them on a pipe: drill a hole, wrap the cam around the pipe and pull the lever down to block it. No need of tools. The body is in PP chemically bonded fiberglass whereas accessorail bolts and screws are made in stainless steel AISI 316. ZPQ swivel nozzles with cam and lever clamps provide excellent performance at high temperatures and easy spray jet orientation.

- Common application

■ Max working temperature

■ Max working pressure

■ Materials
- Surface pre-treatment plants

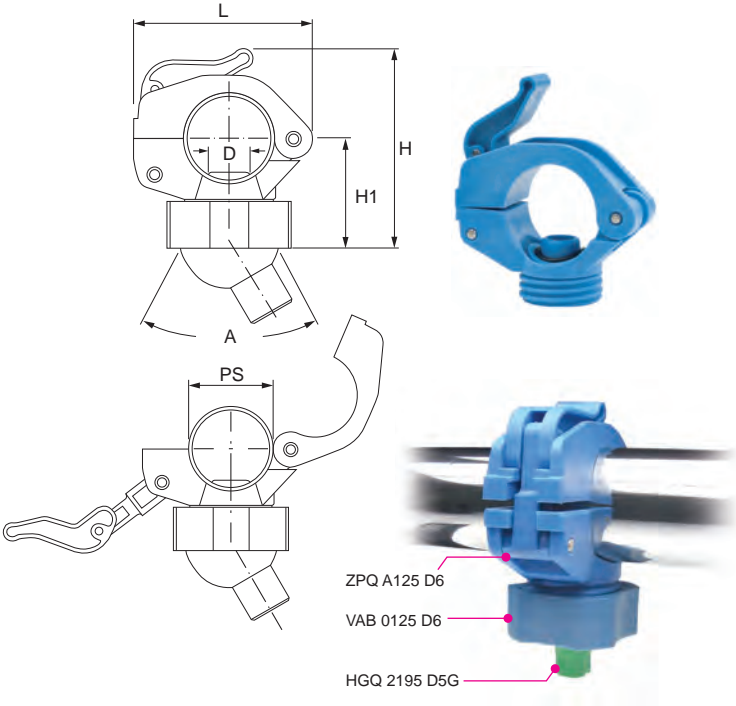
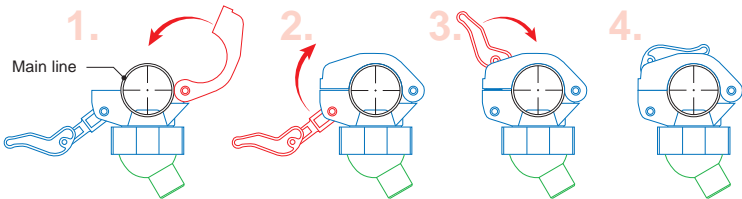
LT 80°C

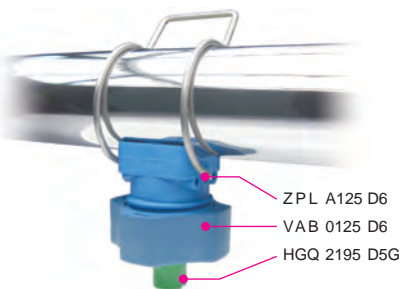
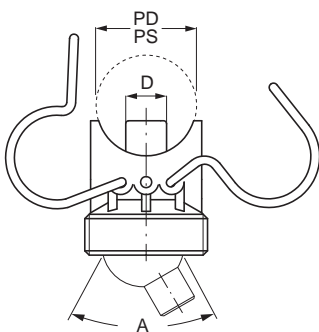
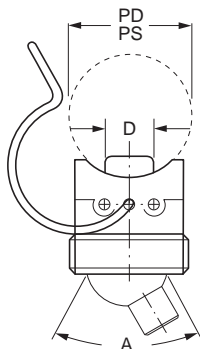
LP 5 bar

Body D6 PP, chemically bonded fiberglass
Pin & bolt B3 AISI 316 Stainless steel
O-ring E8 NBR
Seal D22 Soft polypropylene

Code	PS inch	PD mm	D mm	H mm	H1 mm	L mm	A deg	W g
ZPQ A125 D6	1 1/4"	42/43	20.0	93	41	84	40°	87
ZPQ B125 D6			17.0					
ZPQ A150 D6	1 1/2"	48/49	20.0	96	44	95	40°	97
ZPQ B150 D6			17.0					

HOW TO INSTALL THE SWIVEL NOZZLE CAM & LEVER CLAMPS





SWIVEL NOZZLE SPRING PIPE CLAMPS

ZPL/ZPN pipe clamps are specially designed for swivel ball nozzles. Drill a hole and fix the clamp with one screw. Body is made of fibreglass reinforced PP, screw and spring SUS316. ZPL/ZPN swivel nozzles work under high temperature and high degree of intensity. ZPL/ZPN swivel nozzle pipe clamps are widely used in surface pre-treatment.

- Typical application: Cleaning equipment used in pre-treatment for coating process
- Max working temperature: **LT** 80°C
- Max working pressure: ZPL Single spring 2 bar
ZPN Double spring 3 bar
- Materials: Body **D6** PP, chemically bonded fiberglass
Spring **N1** AISI 302 Stainless steel, heat treated
O-ring **E8** NBR

Code		PS	PD	D	A	W
Single spring	Double spring	inch	mm	mm	deg	g
ZPL C100 D6	ZPN C100 D6	1"	32/34	14.0	40°	
ZPL A125 D6	ZPN A125 D6	1 1/4"	41/43	20.0	40°	
ZPL B125 D6	ZPN B125 D6			17.0		
ZPL C125 D6	ZPN C125 D6			14.0		46/65
ZPL A150 D6	ZPN A150 D6	1 1/2"	46/49	20.0	40°	
ZPL B150 D6	ZPN B150 D6			17.0		
ZPL C150 D6	ZPN C150 D6			14.0		

HOW TO MAKE UP THE PRODUCT CODE

EX.: ZPL C100 D6

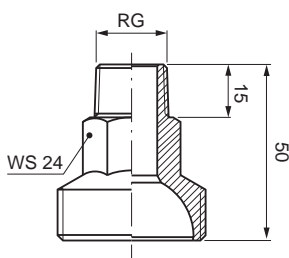
ZPL C100 D6

MATERIAL • D6 - PP, chemically bonded fiberglass

CODE

CLAMP TYPE • ZPL - Single spring • ZPN - Double spring

ZLF (SWIVEL NOZZLE THREADED NIPPLE)



SWIVEL NOZZLE THREADED NIPPLE

ZLF series threaded nipples offer another convenient type of installation for swivel ball nozzles. They are made of fibreglass reinforced PP. ZLF series work under high temperature and high degree of intensity. ZLF threaded nipples are widely used in surface pre-treatment.

- Typical application: Cleaning equipment used in pre-treatment for coating process
- Max working temperature: **LT** 80°C
- Max working pressure: **LP** 4 bar
- Material: **D6** PP, chemically bonded fiberglass

Code	RG inch BSPT	RG inch NPT	W g
ZLF A038 D6	3/8"	-	15
ZLF B038 D6	-	3/8"	
ZLF A050 D6	1/2"	-	
ZLF B050 D6	-	1/2"	

HOW TO MAKE UP THE PRODUCT CODE

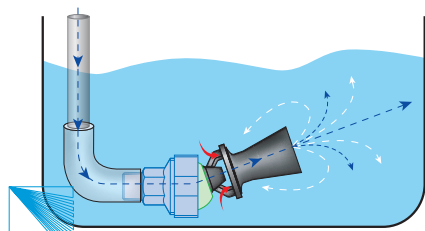
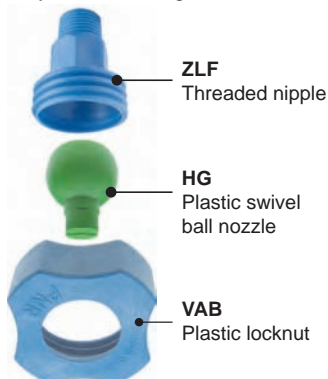
EX.: ZLF A038 D6

ZLF A038 D6

MATERIAL • D6 - PP, chemically bonded fiberglass

CODE

CLAMP TYPE

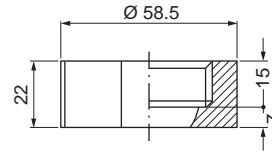
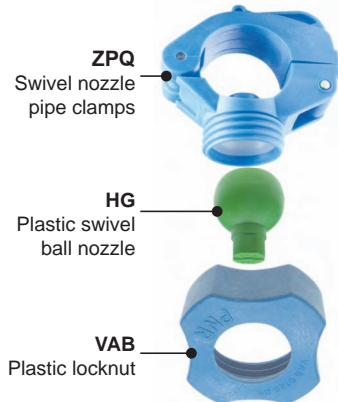


ZLF threaded nipples offer the best mixing effect and are often used in combination with UPB mixing eductors.

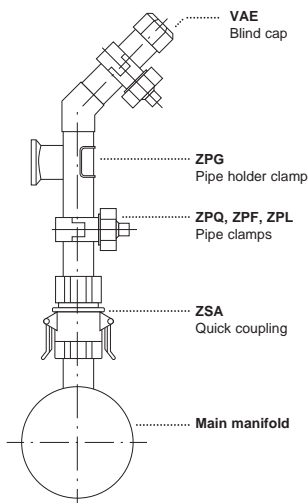
PLASTIC LOCKNUTS

VAB plastic locknuts are exclusively designed for ball nozzles. Their special thread and shape allow to assemble the cap and by hand, with no need of tools, thus making all servicing operations easier and quicker. They are made of high quality PP or chemically bonded fibreglass to keep stability at high temperatures and offer the best resistance to chemicals.

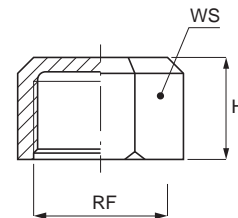
- Material
D6 PP, chemically bonded fiberglass
- Max working temperature
LT 80°C

**VAB 0125 D6****HOW TO MAKE UP THE PRODUCT CODE**EX.: **VAB 0125 D6****VAB 0125 D6****MATERIAL** • D6- PP, chemically bonded fiberglass**CODE****LOCKNUT TYPE**(PLASTIC END CAPS) **VAE****PLASTIC END CAPS**

VAE plastic caps are specially used to close pipes ends. Besides, 1 1/4" VAE 1250 D6 plastic caps can be used to seal pipes ends when, to manufacture different size products, it's necessary to reduce the quantity of swivel nozzles. They are made of high quality PP or chemically bonded fibreglass to keep stability at high temperatures and offer the best resistance to chemicals. They are widely used in surface pre-treatment.



- Material
D6 PP, chemically bonded fiberglass
- Max working temperature
LT 80°C



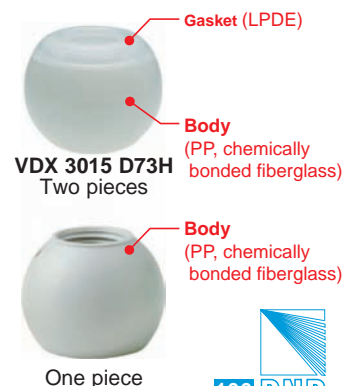
Code	RF inch	H mm	WS mm
VAE 1000 D6	1"	25	42
VAE 1250 D6	1 1/4"	32	52
VAE 1500 D6	1 1/2"	32	60

HOW TO MAKE UP THE PRODUCT CODEEX.: **VAE 1000 D6****VAE 1000 D6****MATERIAL** • D6- PP, chemically bonded fiberglass**CODE****CAP TYPE**(THREADED AND QUICK-FIT SPHERES) **ZBA****THREADED AND QUICK-FIT SPHERES**

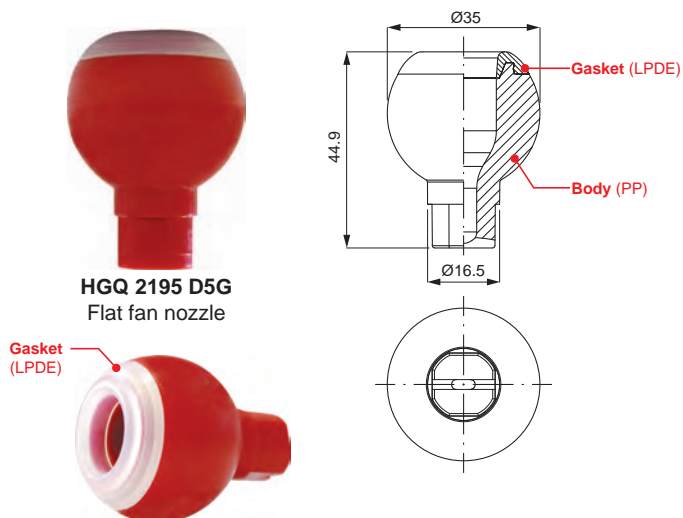
ZBA swivel nozzles are produced with three different types of connections: threaded, quick-fit and blind hole.

The threaded nozzles are assembled to threaded swivel joints. The quick-fit types are designed for HTQ/KSQ quick-fit flat fan nozzles whereas the blind hole models are specially used in spraying processes requiring changes and pauses.

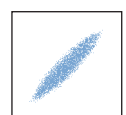
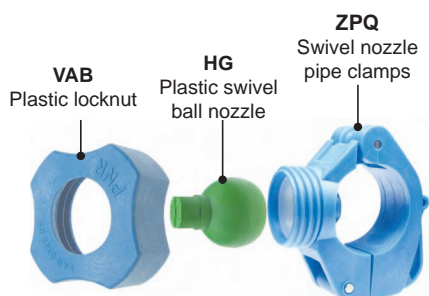
Code		RF BSPP inch	RF NPT inch
One piece	Two pieces		
ZBA A025 D5	ZBA GBN1 D5G	1/4" F	
ZBA B025 D5	ZBA NBN1 D5G		1/4" F
ZBA A038 D5	ZBA GCN1 D5G	3/8" F	
ZBA B038 D5	ZBA NCN1 D5G		3/8" F
ZBA A050 D5	ZBA GDN1 D5G	1/2" F	
ZBA 0000 D5	ZBA 00N0 D5Y	Blind	
ZBA QQN1 D5	ZBA QQN1 D6G	Quick connection	

**VDX 3015 D73H**
Two pieces

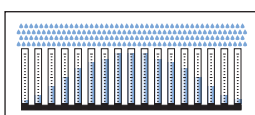
One piece



HGQ 2195 D5G
Flat fan nozzle



Spray section



Convex distribution




PLASTIC SWIVEL BALL NOZZLES

HGQ and RGN plastic swivel ball nozzles are designed for diversified applications. They allow an easy adjustment of their spray jet direction and offer a quick-fit connection.

- Nozzle type: Flat fan nozzles, Hollow cone nozzles
- Typical application: Cleaning equipment used in pre-treatment for coating process
- Material: Body D5 Powder-filled polypropylene


FLAT FAN NOZZLES

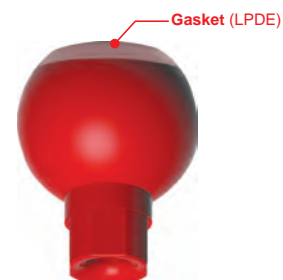
HGQ flat fan nozzles feature a 60° spray angle and their wide range of flow rates makes them the best choice in pre-treatment plants. For an easier identification and use, they are made in different colours depending on the flow rate. The material is top quality PP, chemically bonded fibreglass to offer the best stability at high temperatures and resistance to chemicals.

	Code	Capacity at different pressure values (l/min) (bar)					Color	W g	
60°	HGQ 1390 D5G	1.7	2.0	2.4	2.9	3.3	Black	16	
	HGQ 1770 D5G	3.2	3.8	4.5	5.5	6.4	Purple		
	HGQ 1980 D5G	4.0	4.7	5.6	6.9	8.0	Brown		
	HGQ 2117 D5G	4.6	5.5	6.5	8.0	9.3	Yellow		
	HGQ 2135 D5G	5.5	6.5	7.8	9.5	11.0	Gray		
	HGQ 2155 D5G	6.2	7.4	8.8	10.8	12.5	Red		
	HGQ 2195 D5G	7.8	9.2	11.0	13.8	15.6	Green		
	HGQ 2230 D5G	9.5	11.3	13.5	16.3	19.1	Blue		
	HGQ 2270 D5G	10.9	12.8	15.4	18.8	21.7	Sky blue		
	HGQ 2337 D5G	13.8	16.4	19.5	24.0	27.7	White		
HGQ 2410 D5G	16.7	19.8	23.6	29.0	33.5	Pink			
Pressure (bar)		0,5	0,7	1,0	1,5	2,0			

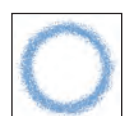
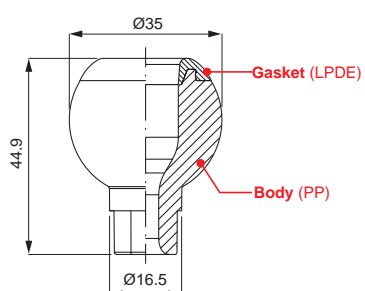
HOLLOW CONE NOZZLES

RGN hollow cone nozzles have a 50° spray angle and offer a wide range of flow rates, all identified by a particular nozzle colour to avoid any possible confusion. The material is top quality PP, chemically bonded fibreglass to offer the best stability at high temperatures and resistance to chemicals. For these features they are widely used in pre-treatment plants.

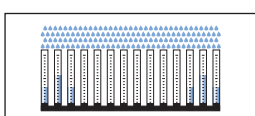
	Code	Capacity at different pressure values (l/min) (bar)					Color	W g
50°	RGN 2175 D5G	7.1	8.5	10.1	12.4	14.3	Red	25
	RGN 2215 D5G	8.8	10.4	12.4	15.2	17.6	Blue	
	RGN 2390 D5G	15.9	18.8	22.5	27.6	31.8	Black	
	Pressure (bar)		0.5	0.7	1.0	1.5	2.0	



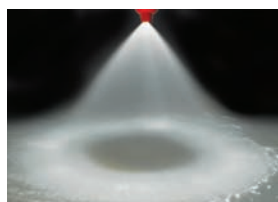
RGN
Hollow cone nozzle



Spray section



Concave distribution



HOW TO MAKE UP THE NOZZLE CODE

EX.: HGQ 1390 D5G

HGQ 1390 D5G

MATERIAL • D5 - Powder-filled polypropylene

CAPACITY


NOZZLE TYPE • HGQ - Flat fan nozzles (60°)

• RGN - Hollow cone nozzles (50°)

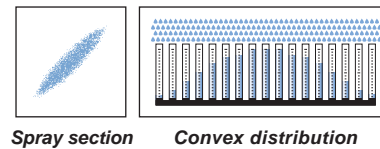
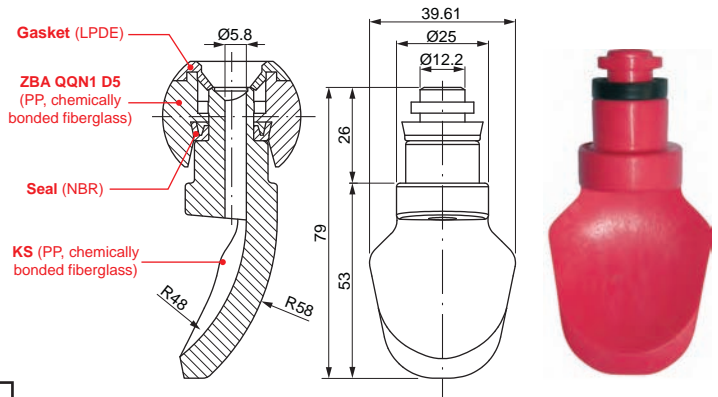
FLAT FAN QUICK-FIT SPOON NOZZLES

KS flat fan quick-fit spoon nozzles produce a flat spray pattern with a 60° deflection spray angle and offer the highest possible impact for a given feed pressure, up to 60° compared to standard turbulence flat fan nozzles. The innovative design ensures the ideal efficiency for deep cleaning and their quick connection makes them easy to assemble and avoids leakage. The different flow rates are identified by their colours available for proper selection. Materials are high quality PP and chemically bonded fibreglass to keep stability at high temperatures and be chemicals-resistant. These nozzles are widely used in surface pre-treatments.

- **Material** PP, chemically bonded fibreglass
- **Typical applications** Cleaning equipment used in pre-treatment for coating process

	Code	Capacity at different pressure values					(l/min) (bar)	Color	W g
60°	KSQ 2155 D6QQ	6.3	7.5	8.9	11.0	12.7	Red	23	
	KSQ 2195 D6QQ	8.0	9.4	11.3	13.8	15.9	Green		
	KSQ 2230 D6QQ	9.4	11.1	13.3	16.3	18.8	Blue		
	KSQ 2270 D6QQ	11.0	13.0	15.6	19.1	22.0	Sky blue		
	KSQ 2337 D6QQ	13.8	16.3	19.5	23.8	27.5	White		
	KSQ 2390 D6QQ	15.9	18.8	22.5	27.6	31.8	Orange		
	KSQ 2410 D6QQ	16.7	19.8	23.7	29.0	33.5	Pink		
	KSQ 2433 D6QQ	17.7	20.9	25.0	30.6	35.4	Brown		

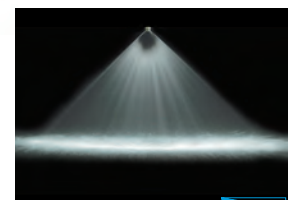
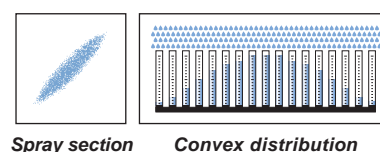
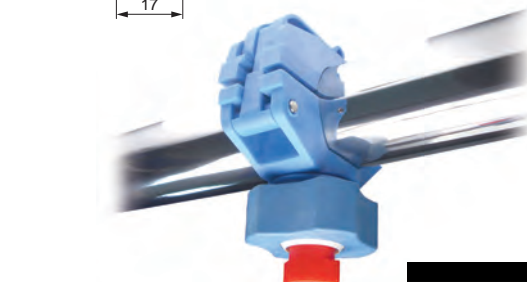
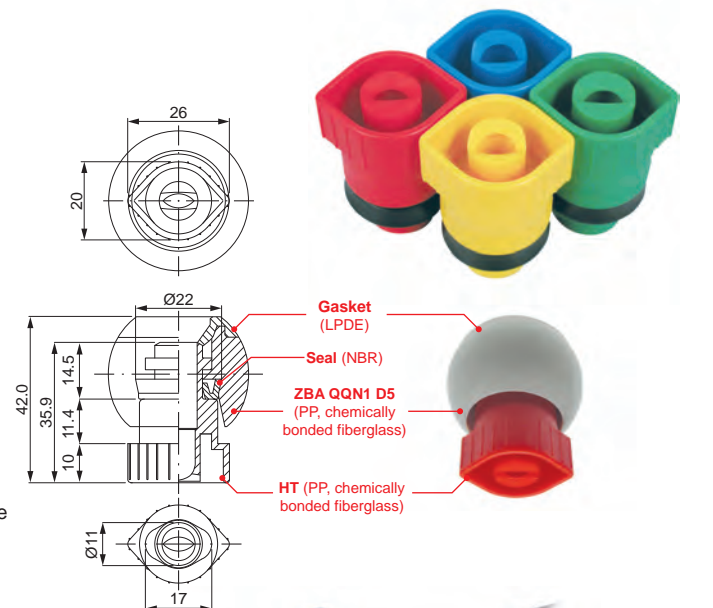
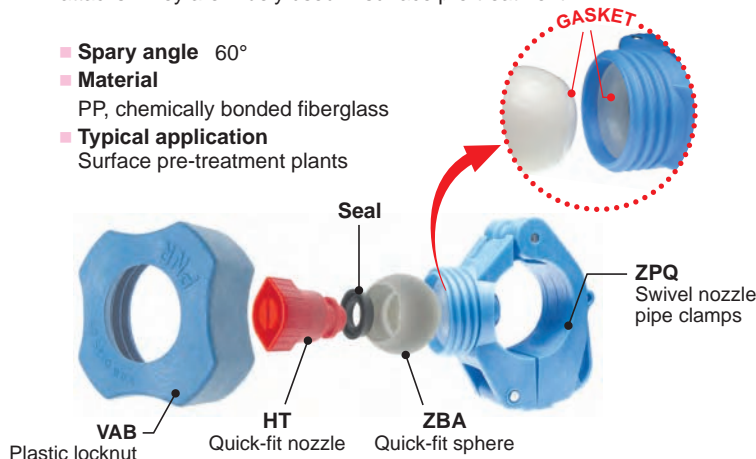
Perssure (bar) 0,5 0,7 1,0 1,5 2,0


(FLAT FAN QUICK-FIT NOZZLES) **HT**

FLAT FAN QUICK-FIT NOZZLES

HTQ type flat fan quick-fit nozzles feature 60° spray angle and impact force for a given feed pressure. The new design offers the ideal efficiency for cleaning, quick-fit design for ease of assembly and seal that avoids leakage. Different flow rates are distinguished by color and available for selection. The materials are high quality PP, chemically bonded fiberglass in order to remain stable in high temperature and chemical attacks. They are widely used in surface pre-treatment.

- **Sprary angle** 60°
- **Material** PP, chemically bonded fiberglass
- **Typical application** Surface pre-treatment plants

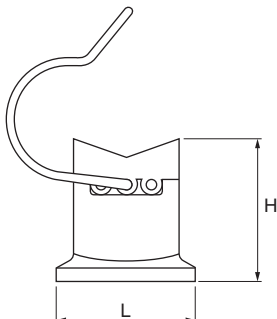


	Code	Capacity (l/min) at different pressure values (bar)						Color
60°	HTQ 1390 D6QQ	1.6	1.9	2.3	2.8	3.2	Black	
	HTQ 1590 D6QQ	2.4	2.8	3.4	4.2	4.8	Purple	
	HTQ 1780 D6QQ	3.2	3.8	4.5	5.5	6.4	Lilac	
	HTQ 2117 D6QQ	4.8	5.7	6.8	8.3	9.6	Yellow	
	HTQ 2153 D6QQ	6.2	7.4	8.8	10.8	12.5	Red	
	HTQ 2195 D6QQ	8.0	9.4	11.3	13.8	15.9	Green	
	HTQ 2230 D6QQ	9.4	11.1	13.3	16.3	18.8	Blue	
	HTQ 2274 D6QQ	11.2	13.2	15.8	19.4	22.4	Sky blue	

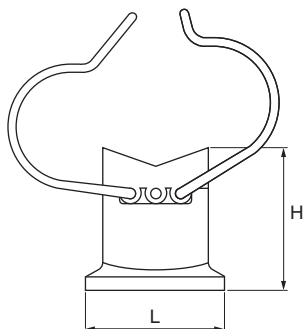
Perssure (bar) 0,5 0,7 1,0 1,5 2,0



Single spring



Double spring



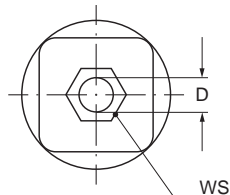
PIPE HOLDERS

ZPG pipe holders are a user-friendly and convenient solution for fixing spray manifolds onto tunnels walls in surface treatment plants. They are easy to assemble, excellent fastening and low cost. The single spring type is suitable for plastic holder whereas the double spring version is meant for metallic pipe holders.

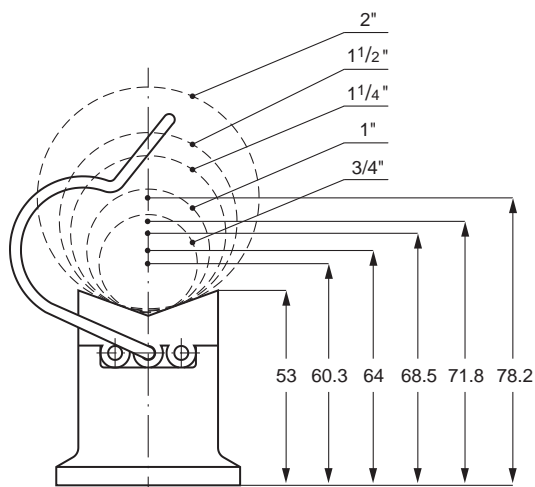
- Typical application Cleaning equipment used in pre-treatment for coating process
- Pipe size **PS** 3/4", 1", 1 1/4", 1 1/2", 2"
- Materials Body **D6** PP, chemically bonded fiberglass
 Springs **N1** AISI 302 Stainless steel, heat treated

Code		PS	D	H	L	WS	W
Single spring	Double spring	inch	mm	mm	mm	mm	g
ZPG 1075 D6	ZPG 2075 D6	3/4"	11	53	50	17	72
ZPG 1100 D6	ZPG 2100 D6	1"					72
ZPG 1125 D6	ZPG 2125 D6	1 1/4"					90
-	ZPG 2150 D6	1 1/2"					90
-	ZPG 2200 D6	2"					110

Weight values are based on the double spring version



ZPG body is designed to be fastened to the tunnel wall by means of one M10 bolt with 17 mm hexagonal head.



The drawing shows the distances of the pipe central axis from the wall for different pipe sizes assembled onto the pipe holder.

HOW TO MAKE UP THE PRODUCT CODE

EX.: ZPG 1075 D6

ZPG 1 075 D6

MATERIAL • D6 - PP, chemically bonded fiberglass

PIPE CODE • 075 - 3/4"
• 100 - 1"
• 125 - 1 1/4"
• 150 - 1 1/2"
• 200 - 2"

CLAMP CODE • 1 - Single spring
• 2 - Double spring

PIPE HOLDERS



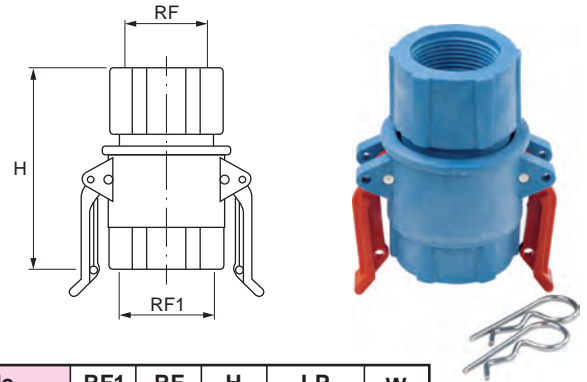
The above photo shows a European top coating plant using our products

QUICK COUPLING JOINTS

ZSA quick coupling joints are a very popular solution for industrial facilities requiring ease of operation.

- Thread size 3/4", 1", 1 1/4", 1 1/2"
- Thread specification BSP, NPT
- Typical applications Cleaning equipment used in pre-treatment for coating process
Addition and release of liquids in chemical tankers
- Materials

Body	D6	PP, chemically bonded fiberglass
Lever	B3	AISI 316 Stainless steel
	B31	AISI 316L Stainless steel, cast
	B35	AISI 316 Stainless steel, sintered
	D8	PVDF, Polyvinylidene fluoride
O-ring	E0	EPDM
	E7	Viton
	E8	NBR



Code	RF1 inch	RF inch	H mm	LP bar	W kg
ZSA 0075 B3x	3/4"	3/4"	85	15	*
ZSA 0100 B3x	1"	1"	73	15	
ZSA 0100 D6x			73	7	
ZSA 0125 B3x	1 1/4"	1 1/4"	110	15	
ZSA 0125 D6x				7	
ZSA 0150 D6x	1 1/2"	1 1/4"	110	6	
ZSA 0151 B3x	1 1/2"	1 1/2"	110	15	
ZSA 0151 D6x				6	

* Weight values for different materials are given on request.

**HOW TO MAKE UP THE
PRODUCT CODE**

EX.: **ZSA 0075 B3B**

ZSA 0075 B3 x

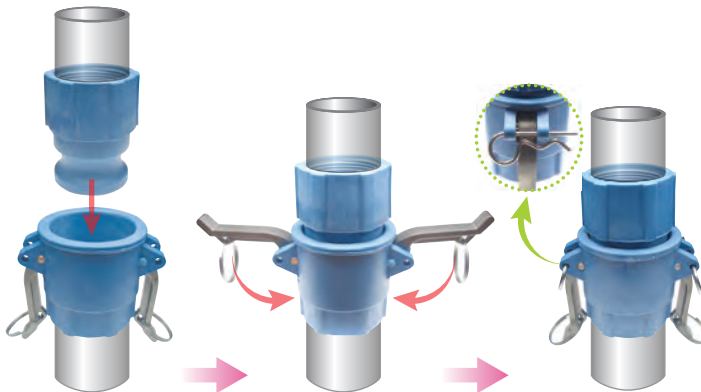
MATERIAL

- **B3** - AISI 316 Stainless steel
- **D6** - PP, chemically bonded fiberglass

CODE

QUICK COUPLING JOINTS

X	Orientation	Lever material	O-ring	Rings
B	Fixed	AISI 316, sint	EPDM	AISI 316
C	Fixed	PVDF	EPDM	AISI 316
D	Fixed	PVDF	VITON	AISI 316
H	Fixed	AISI 316, sint	VITON	AISI 316
S	Free	AISI 316, sint	EPDM	AISI 316
T	Free	PVDF	EPDM	AISI 316
U	Free	PVDF	VITON	AISI 316
Y	Free	AISI 316, sint	VITON	AISI 316

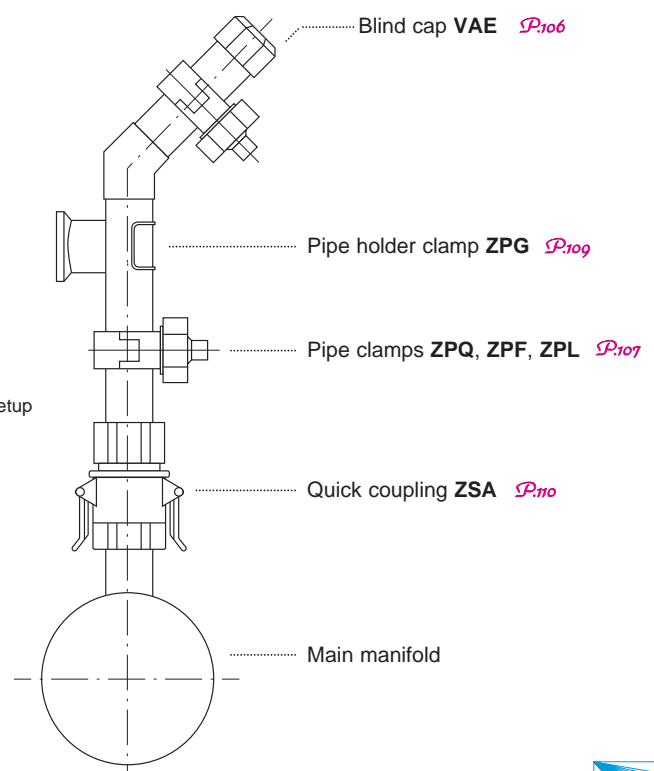
QUICK COUPLING JOINTS - INSTALLMENT


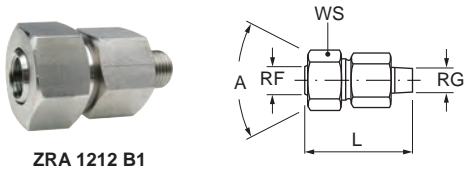
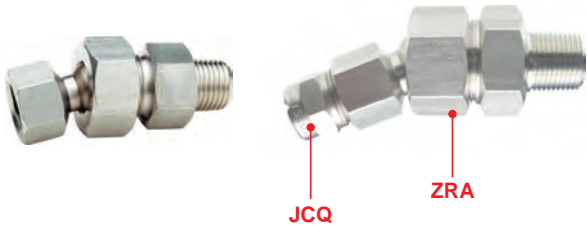
- A. Join two parts of quick coupling together B. Put levers down and fasten C. Fix bolt and complete setup

QUICK FITTING RISERS AND HEADER MANIFOLDS

Our range of products for surface pre-treatment plants is the most complete on the market and has been developed in collaboration with the most important system manufacturers on a worldwide basis. PNR has designed most of the assembly accessories commonly adopted today in pre-treatment plants.

Right figure shows the installment steps. Quick couplings and pipe holder clamps can be quickly assembled and disassembled in seconds to minimize maintenance and shut-off time.



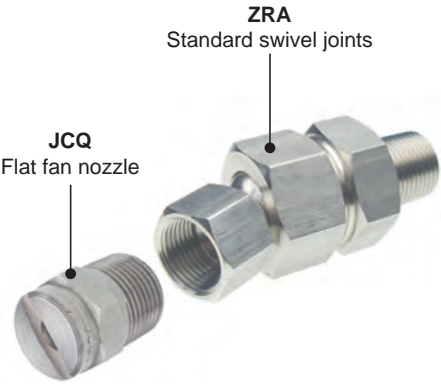


STANDARD SWIVEL JOINTS

ZRA/ZRB/ZRC are standard swivel joints for manufacturing plants requiring product diversification. The fitting and adjustment of the joints can be done easily by tightening the hexagonal screw cap.

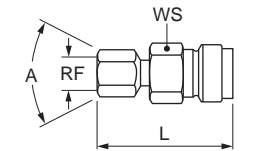
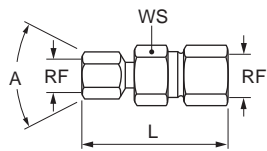
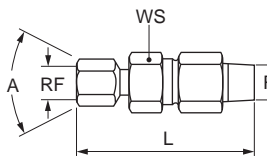
- Typical applications
 - Cleaning equipment used in pre-treatment for coating process.
 - Continuous casting cooling.
- Inlet thread size
 - 1/8", 1/4", 3/8", 1/2", 3/4"
- Outlet thread size
 - 1/8", 1/4", 3/8", 1/2", 3/4"
- Max working pressure
 - LP 21 bar
- Materials
 - B1 AISI 303 Stainless steel
 - B31 AISI 316L Stainless steel
 - T1 Brass

Code	RG poll	RF poll	L mm	A deg	WS mm	W g
ZRA 1212 xx YY	1/8"	1/8"	38	50°	22	57
ZRA 2525 xx YY	1/4"	1/4"	57			75
ZRA 2626 xx YY	1/4"	1/4"	67	60°	27	147
ZRA 3826 xx YY	3/8"	1/4"	67			150
ZRA 3838 xx YY	3/8"	3/8"	70			155
ZRA 5050 xx YY	1/2"	1/2"	74	40°	27	186
ZRA 7575 xx YY	3/4"	3/4"	92		40	468



HOW TO MAKE UP THE PRODUCT CODE EX.: ZRA 1212 B1SB

- ZRA 1212 xx YY**
- CONNECTION
 - SB - BSP
 - SN - NPT
 - MATERIAL
 - B1 - AISI 303 Stainless steel
 - B31 - AISI 316L Stainless steel
 - T1 - Brass
 - OUTLET THREAD SIZE
 - 12 - 1/8"
 - 25 - 1/4"
 - 38 - 3/8"
 - 50 - 1/2"
 - 75 - 3/4"
 - INLET THREAD SIZE
 - 12 - 1/8"
 - 25 - 1/4"
 - 38 - 3/8"
 - 50 - 1/2"
 - 75 - 3/4"



Nozzle type	Inlet	Outlet
ZRA	Male	Female
ZRB	Female	Female
ZRC	Welded	Female

TRIANGLE FLANGED SWIVEL JOINTS

ZRP triangular flanged swivel joints have a robust metallic structure, are easy to fit and adjust and are widely used in manufacturing plants requiring product diversification.

- Typical applications Cleaning equipment used in pre-treatment for coating process.
Continuous casting cooling.
- Inlet thread size 1/8", 1/4", 3/8"
- Outlet thread size 1/8", 1/4", 3/8"
- Max working pressure **LP** 15 bar

Code	RG inch	RF inch	L mm	B mm	L1 mm	A deg	W g
ZRP 1212 xx	1/8"	1/8"	30	40	35	50°	65
ZRP 2512 xx	1/4"	1/8"	32				92
ZRP 2525 xx	1/4"	1/4"	40	50	45	60°	140
ZRP 2538 xx	1/4"	3/8"	40				150
ZRP 3825 xx	3/8"	1/4"	40				150
ZRP 3838 xx	3/8"	3/8"	40				150

HOW TO MAKE UP THE
PRODUCT CODEEX.: **ZRP 1212 B1****ZRP 1212 xx**

MATERIAL

- **B1** - AISI 303 Stainless steel
- **T1** - Brass
- **B3** - AISI 316 Stainless steel (optional)

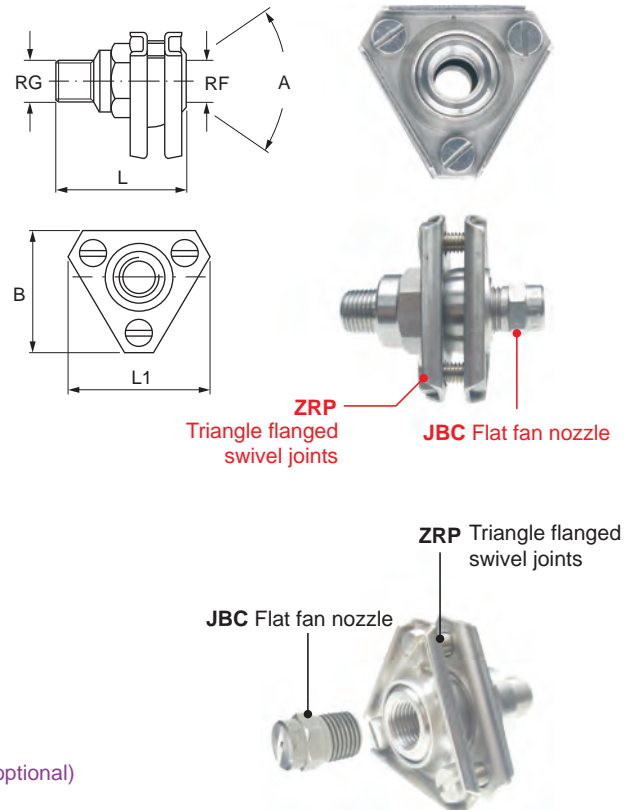
OUTLET THREAD SIZE

- **12** - 1/8"
- **25** - 1/4"
- **38** - 3/8"

INLET THREAD SIZE

- **12** - 1/8"
- **25** - 1/4"
- **38** - 3/8"

JOINT TYPE

(LARGE CAPACITY SWIVEL JOINTS) **ZRQ**

LARGE CAPACITY SWIVEL JOINTS

ZRQ series swivel joints are suitable for operating environments requiring large capacities and product diversification. Once set, they can be easily fitted and adjusted.

- Typical applications Cleaning equipment used in pre-treatment for coating process.
Continuous casting cooling.
- Inlet / Outlet thread size 1", 1 1/4", 1 1/2", 2", 2 1/2"
- Max working pressure **LP** 9 bar
- Materials **B1** AISI 303 Stainless steel
 B3 AISI 316 Stainless steel
 T1 Brass

Code	RG inch	RG1 inch	RF inch	L mm	D mm	A deg	W kg
ZRQ 8080 xx	1"	-	1"	89	92	40°	1.8
ZRQ 8282 xx	1 1/4"	-	1 1/4"	130			2.1
ZRQ 8482 xx	1 1/2"	-	1 1/4"	133			2.4
ZRR 8282 xx	1 1/4"	1 1/4"	-	130	92	40°	2.2
ZRR 8284 xx	1 1/2"	1 1/4"	-	130			2.2
ZRR 8484 xx	1 1/2"	1 1/2"	-	130			2.4
ZRR 8686 xx	2"	2 1/2"	-	203	158	40°	8.0
ZRR 8888 xx	2 1/2"	2 1/2"	-	229			8.8

HOW TO MAKE UP THE
PRODUCT CODEEX.: **ZRQ 8080 B1****ZRQ 8080 xx**

MATERIAL

- **B1** - AISI 303 Stainless steel
- **B3** - AISI 316 Stainless steel
- **T1** - Brass

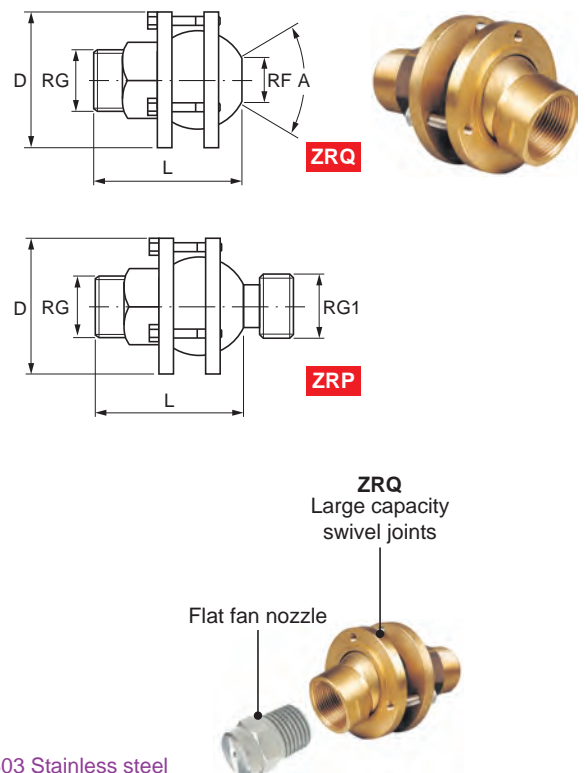
OUTLET THREAD SIZE

- **80** - 1"
- **82** - 1 1/4"
- **84** - 1 1/2"
- **86** - 2"
- **88** - 2 1/2"

INLET THREAD SIZE

- **80** - 1"
- **82** - 1 1/4"
- **84** - 1 1/2"

- **ZRQ** - Female
- **ZRR** - Male



Length conversion table

μm	mm	cm	m	inch	ft
1	1×10^{-3}	1×10^{-4}	1×10^{-6}	3.94×10^{-5}	3.28×10^{-6}
1×10^3	1	0.1	1×10^{-3}	3.94×10^{-2}	3.28×10^{-3}
1×10^4	10	1	1×10^{-2}	3.94×10^{-1}	3.28×10^{-2}
1×10^7	1×10^3	100	1	39.4	3.28
2.54×10^4	25.4	2.54	2.54×10^{-2}	1	8.33×10^{-2}
3.05×10^5	3.05×10^2	30.5	3.05×10^{-1}	12	1

Area conversion table

cm^2	m^2	inch^2	ft^2
1	1×10^{-4}	0.155	1.08×10^{-3}
1×10^4	1	1.55×10^3	10.8
6.45	6.45×10^{-4}	1	6.94×10^{-3}
9.30×10^2	9.30×10^{-2}	1.44×10^2	1

Volume conversion table

cm^3	Liter	m^3	ft^3	US gallon
1	1×10^{-3}	1×10^{-6}	3.53×10^{-5}	2.64×10^{-4}
1000	1	1×10^{-3}	3.53×10^{-2}	0.264
1×10^6	1000	1	353	264
2.83×10^4	28.3	2.83×10^{-2}	1	0.749
3.79×10^3	3.79	3.79×10^{-3}	1.34	1

Pressure conversion table

MPa	KPa	Bar	Kg/cm^2	P.S.I	atm	mHg
1	1000	10	10.2	145	9.87	7.5
0.001	1	0.01	0.011	0.145	9.87×10^{-3}	7.5×10^{-1}
0.1	100	1	1.02	14.5	0.987	0.75
0.09807	98.07	0.981	1	14.22	0.968	0.736
0.00689	6.89	0.069	0.07	1	0.068	0.052
0.101	1.01×10^2	1.013	1.033	14.7	1	0.76
0.133	1.33×10^2	1.33	1.36	19.3	1.32	1

Flow rate unit conversion table

l/min	m^3/min	m^3/hour	$\text{Inch}^3/\text{hour}$	ft^3/hour	US gallon/min
1	0.001	0.06	3.66×10^3	2.12	0.264
1000	1	60	3.66×10^6	2.12×10^3	264
16.67	0.017	1	6.1×10^4	35.3	4.40
2.73×10^{-4}	2.7×10^{-7}	1.64×10^{-5}	1	5.79×10^{-4}	7.22×10^{-6}
0.472	4.72×10^{-4}	0.028	1.728	1	0.125
3.79	0.004	0.227	1.39×10^4	8.02	1

Air pipe table

Pipe size	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"
Pressure loss per 10m (bar)	1.25	0.733	0.56	0.44	0.287	0.214	0.138	0.108
Inlet pressure (bar)	Max capacity values (NL/min)							
1.5	163	314	668	1076	1885	3150	4960	6630
2.0	179	344	730	1180	2060	3450	5430	7280
3.0	206	395	840	1360	2375	3900	6300	8400
4.0	230	422	940	1520	2660	4450	7000	9360
5.0	252	485	1030	1660	2920	4875	7700	10250
6.0	272	523	1110	1800	3140	5250	8300	11050
7.0	292	558	1185	1920	3350	5620	8870	11800

Liquid pipe table

Inlet pressure : 3 bar

Diameter Inch	Max capacity values l/min
1/8"	11.20
1/4"	44.70
3/8"	100.80
1/2"	179.30
3/4"	402.00
1"	716.30
1 1/4"	1121.84
1 1/2"	1610.75
2"	2865.24


Flow rate and pipe diameter

Diameter		Steel pipe		Length 10 m
A	B	Inner diameter	Outer diameter	Capacity value at 0.1~0.3 kg/cm ² pressure loss
6A	1/8B	6.5	10.5	1.3 ~ 2.2
8A	1/4B	9.2	13.8	3 ~ 5.2
10A	3/8B	12.7	17.3	7 ~ 12
15A	1/2B	16.1	21.7	12 ~ 21
20A	3/4B	21.6	27.2	22 ~ 38
25A	1B	27.6	34.0	38 ~ 65
32A	1 1/4B	35.7	42.7	70 ~ 120
40A	1 1/2B	41.6	48.6	120 ~ 210
50A	2B	52.9	60.5	215 ~ 370
65A	2 1/2B	67.9	76.3	410 ~ 700
80A	3B	80.7	89.1	680 ~ 1200
100A	4B	105.3	114.3	1200 ~ 2100
125A	5B	130.8	139.8	2100 ~ 3600
150A	6B	155.2	165.2	3300 ~ 5700

ABBREVIATIONS

Code	Name	Unit	Code	Name	Unit	Code	Name	Unit
CL	Jet deflection angle	deg	DIA	Outside diameter	mm	NR	Number of orifices	pcs
D	Conventional orifice dia	mm	DU	Liquid outer diameter	mm	QC	Quickfit connection	--
D1	Smallest free inside dia	mm	E	Inlet diameter	mm	RF	Female BSP straight thread	inch
D2	Liquid inlet diameter	mm	EF	Flange diameter	mm	RG	BSPT male taper thread	inch
D3	Liquid outlet diameter	mm	FF	Flange outer diameter	mm	SQ	Square bar size	mm
DE	Liquid inlet diameter	mm	G	Flange center-hole dia	mm	UF	Outlet diameter	inch
DF	Flange size	inch	H,H1,H2	Height	mm	WS	Wrench size (female)	mm
DN	Flange nominal size	mm	L,L1	Length	mm	WS1	Wrench size (female)	mm

SPRAY ANGLE AND DISTANCES

 Spray angle	SPRAY DISTANCES (mm)													
	50	100	150	200	250	300	400	500	600	700	800	900	1000	1500
	Theoretical coverage at various distances from the nozzle (mm)													
5°	4.4	8.7	13.1	17.5	21.8	26.2	34.9	43.7	52.4	61.1	69.9	78.6	87.3	131.0
10°	8.7	17.5	26.2	35.0	43.7	52.5	70.0	87.5	105.0	122.0	140.0	158.0	175.0	262.0
15°	13.2	26.3	39.5	52.7	65.8	79.0	105.0	132.0	158.0	184.0	211.0	237.0	263.0	395.0
20°	17.6	35.3	52.9	70.5	88.2	106.0	141.0	176.0	212.0	247.0	282.0	317.0	353.0	529.0
25°	22.2	44.3	66.5	88.7	111.0	133.0	177.0	222.0	266.0	310.0	355.0	399.0	443.0	665.0
30°	26.8	53.6	80.4	107.0	134.0	161.0	214.0	268.0	322.0	375.0	429.0	482.0	536.0	804.0
35°	31.5	63.1	94.6	126.0	158.0	189.0	252.0	315.0	378.0	441.0	504.0	568.0	631.0	946.0
40°	36.4	72.8	109.0	146.0	182.0	218.0	291.0	364.0	437.0	510.0	582.0	655.0	728.0	1092.0
45°	41.4	82.8	124.0	166.0	207.0	249.0	331.0	414.0	497.0	580.0	663.0	746.0	828.0	1243.0
50°	46.6	93.3	140.0	187.0	233.0	280.0	373.0	466.0	560.0	653.0	746.0	839.0	933.0	1399.0
55°	52.1	104.0	156.0	208.0	260.0	312.0	416.0	521.0	625.0	729.0	833.0	937.0	1041.0	1562.0
60°	57.7	115.0	173.0	231.0	289.0	346.0	462.0	577.0	693.0	808.0	924.0	1039.0	1155.0	1732.0
65°	63.7	127.0	191.0	255.0	319.0	382.0	510.0	637.0	764.0	892.0	1019.0	1147.0	1274.0	1911.0
70°	70.0	140.0	210.0	280.0	350.0	420.0	560.0	700.0	840.0	980.0	1120.0	1260.0	1400.0	2101.0
75°	76.7	153.0	230.0	307.0	384.0	460.0	614.0	767.0	921.0	1074.0	1228.0	1381.0	1535.0	2302.0
80°	83.9	168.0	252.0	336.0	420.0	503.0	671.0	839.0	1007.0	1175.0	1343.0	1510.0	1678.0	2517.0
85°	91.6	183.0	275.0	367.0	458.0	550.0	733.0	916.0	1100.0	1283.0	1466.0	1649.0	1833.0	2749.0
90°	100.0	200.0	300.0	400.0	500.0	600.0	800.0	1000.0	1200.0	1400.0	1600.0	1800.0	2000.0	3000.0
95°	109.0	218.0	327.0	437.0	546.0	655.0	873.0	1091.0	1310.0	1528.0	1746.0	1964.0	2183.0	3274.0
100°	119.0	238.0	358.0	477.0	596.0	715.0	953.0	1192.0	1430.0	1668.0	1907.0	2145.0	2384.0	3575.0
110°	143.0	286.0	428.0	571.0	714.0	867.0	1143.0	1430.0	1714.0	1999.0	2285.0	2571.0	2856.0	
115°	157.0	314.0	471.0	628.0	785.0	942.0	1256.0	1570.0	1884.0	2197.0	2511.0	2825.0	3139.0	
120°	173.0	346.0	520.0	693.0	866.0	1039.0	1386.0	1732.0	2078.0	2425.0	2771.0	3117.0	3464.0	
130°	214.0	429.0	643.0	858.0	1072.0	1287.0	1716.0	2145.0	2573.0	3002.0	3431.0	3860.0		
140°	275.0	549.0	824.0	1099.0	1374.0	1648.0	2198.0	2747.0	3297.0	3846.0				
150°	373.0	747.0	1120.0	1493.0	1866.0	2240.0	2986.0	3733.0						
160°	567.0	1134.0	1702.0	2269.0	2837.0	3403.0								
170°	1143.0	2285.0	3429.0											