



# SPRAY NOZZLES FOR INDUSTRIAL APPLICATIONS



**INDUSTRIAL  
TANK WASHING  
SYSTEM**

## INTRODUCTION

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### TECHNICAL PUBLICATIONS

PNR manufactures a complete range of spray nozzles for industrial applications, as well as products and systems specially designed for specific industries. Information about our Company and our product range is available through the following publications

SPRAY NOZZLES & ASSEMBLY FITTINGS	CTG GN
INDUSTRIAL TANK WASHING SYSTEMS	CTG LS
AIR ASSISTED ATOMIZERS	CTG AZ
SPRAY ENGINEERING HANDBOOK	CTG SH
STEELWORK NOZZLES	CTG SW
SOLUTIONS FOR THE PULP AND PAPER INDUSTRY	CTG PN

As a result of continuous product improvement our documentation is regularly updated: please visit our website [www.pnr.eu](http://www.pnr.eu) to be always updated.

### NOTES

Our products are continuously being reviewed and modified to keep up with the latest state of technology. As a result the technical information provided in this catalogue is for guidance only and is not binding. We regret not being able to provide our customers with notification of such changes all of the time. Should you have an application that requires some special features such as specific flow rates or spray angles for example, then please issue a written request before sending your order and we'll do our best to meet your requirements. All information contained in this catalogue, including product data, product codes, diagrams and photographs are the exclusive property of Flowtech. It is forbidden to reproduce any part of this catalogue without having obtained written permission from Flowtech first.

Dimensions in this catalogue are given in millimetres (mm). All threads are made according to the ISO 228 standards (European norms BS 2779 – DIN 259 – UNI 338). Explanations about the abbreviations used in the catalogue are given on page 24. All mentioned Trademarks are the property of their respective owners.

Our Company has qualified its quality system with DNV, following ISO 9001/2015 standard.

**COMPANY WITH  
QUALITY SYSTEM  
CERTIFIED BY DNV GL  
= ISO 9001:2015 =**

## TANK WASHING TECHNIQUES

The continuous research for higher efficiency in all kind of industries, and the requirement to assure a constant and higher quality level for their products, highlight the necessity that every step in the production, stocking and transporting processes are performed using adequately clean systems and tanks.

At the same time, as disposing of liquid effluents is becoming more and more costly, it becomes necessary that each cleaning process, while reaching a totally satisfactory result, is performed using the lowest possible volume of cleaning solution.

The two above factors have originated the introduction on the market of an always wider variety of tank cleaning devices, ranging from the classic fixed head to more and more sophisticated models to cope with the most demanding applications.

Our long experience in the field of tank cleaning suggests that the following basic concepts are given proper consideration in order to determine the correct washing cycle for each single application, and consequently the most suitable type of tank cleaning device.

### 1 PROPER FILTERING FOR THE WASHING LIQUID

Small inner passages and precision machined parts are typically found in tank washing equipment.

In such cases where the washing cycle is performed by means of a recycled solution the solid particles which may be dispersed into the solution must be characterized for dimension and properties. Since suspended solid particles may affect proper operation of tank washing equipment, or require more frequent cleaning or service of the same, we suggest that a suitable line filter be considered: you can check pag. 20 of this catalogue, while the catalogue "Spray nozzles & assembly fittings" presents a wide range of filters, for every application.

### 2 CORRECT CHOICE FOR WASHING CYCLE AND SOLUTION

Based on the type of product which has to be eliminated, each single process has to be examined in order to define such parameters as the appropriate washing fluid, the right temperature, jet pressure and washing time of every phase.

### 3 ADEQUATE MOTIVE MECHANISM

The number of products which need to be removed from the wall of a tank is near to endless, each one showing its own different properties.

Washing cycles can range from a quick water rinse at low pressure and ambient temperature, to long lasting cycles using hot water and caustic, sometimes at high pressure.

The latter situation requires both a slow motion of the fluid jets, which have to hit the tank wall without breaking into drops and loose their impact, and a properly indexed rotation so that the revolving jets do not hit the same path at each turn.

Our tankwashers range, the most complete on the market, is classified by number of rotation axis and type of motive mechanism.

### 4 CLEANING RADIUS / WETTING RADIUS

It is not possible to define the cleaning radius of any tank washing equipment without making reference to precise conditions as the product to be eliminated, the cleaning fluid, the operating pressure and temperature.

Such value can only be determined by experience, for each single given process.

It is instead possible to define a wetting radius, as the radius where the equipment can wet the entire tank inner surface: in this condition it must be expected the fluid to hit the wall with a small fraction of its original impact force.

The maximum wetting radius for each one of our product is stated in the table at page 23 of this catalogue.

## INTRODUCTION

### TANK WASHING TECHNIQUES

#### CONSTRUCTION MATERIALS

Because of their application in the chemical, food and pharmaceutical processes tankwashers are manufactured as a rule out of high quality materials, offering in various combinations high resistance to corrosion and ability to withstand high temperatures.

Metal parts are usually made of austenitic stainless steel, mostly AISI 316L and AISI 316Ti grades, while some special applications may require high grade alloys like Hastelloy, in a variety of types. Parts in plastic materials are normally made out Teflon, Graphite-filled Teflon or PEEK.

#### EFFICIENCY ASSESSMENT

It is very difficult to assess such value as the efficiency range with reference to a given tank washing device without taking into considerations the various parameters relating to the process conditions, such as the materials you have to remove, working temperature and pressure, the time of every washing cycle.

While choosing a tank washing head, you have to consider if:

- the wetting radius is adequate for the dimension of the tank (check the wetting radius at page 23 of this Catalogue)
- the capacity can provide the whole inner surface with a correct amount of washing solution for square measure;
- the impact force of the jet and the time required to complete a cleaning cycle are adequate for the product and/or process.

While taking in consideration all these elements, PNR Italia can suggest one or more suitable tank washing heads, depending on the specific case.

#### CLEANING VALIDATION

This is the process whereby the desired cleaning condition is verified by means of a repeatable technique supplying results easily readable and according to the quality control requirements. There are two main verification you can do, in order to have a correct validation:

##### 1) adequate distribution of the spray on the surface of the tank

It's common to spray the inner surface of the tank with Riboflavin, then to complete a cleaning cycle, and therefore to examine with an ultraviolet lamp that every trace of Riboflavin has been eliminated. Riboflavin is easily miscible with water at ambient temperature and should be completely eliminated from the surface when the same is satisfactorily covered by the washing jets. Traces of Riboflavine still sticking to the surface are revealed through an ultra-violet long wave light, and indicate areas not properly covered from the washing operation.

##### 2) Absence of organic residue

Cleaning operations tend to eliminate proteins spots of animal/vegetable origin, nourishment for microorganisms that facilitate the development of bacteria and retrain active molecules. The variety of possible cases and of existing regulations is such that the validation methodology is examined on a case-by-case basis. For example, a very common the technique is ATP-metry to count bacteria, which is based on ATP (Adenosine triphosphate, source of energy present in all living cells): the degradation reaction of ATP produces photons, whose intensity it is proportional to the amount of ATP present, and therefore the measurement of luminous intensity with a luminometer gives information on the quantity of cells present, and therefore on the cleaning condition of the tank.

#### DEFINITIONS

##### Spray coverage

It is the solid angle covered by the jets, with an origin in the point of the tank washer at the water inlet, and defined as follows:

- the reference direction is the one of the fluid in the inlet connection;
- the direction of the jet is DOWN when it is concurrent to the reference direction;
- the direction of the jet is UP when it is opposite to the reference direction.

##### Single axis heads

It's a device where the moving part is rotating around the vertical axis of the feed pipe. They are more suitable to wash products with low resistance.

##### Twin axis heads

It's a device where the washing nozzles rotate around an horizontal axis, while the tankwasher body carrying the nozzles rotates at the same time around the vertical axis of the feed pipe. They allow stronger washing actions.

##### FDA approved

With this sentence, we confirm that the materials used for manufacturing the products fall within the list of the FDA and CE 1935/2004 approved food grade materials. Among them we have AISI 316L, PTFE, PEEK.

**FIXED SPRAY HEADS**

**FIXED SPRAY HEADS**

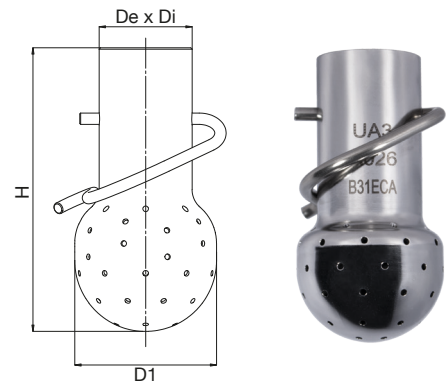
The most simple tank washing devices, fixed heads or spray balls are the classic equipment used in thousands of tanks for their reliability and since easily kept in perfect hygienic conditions. Their low impact properties and high volume fluid requirement limit their use to small tank sizes and processes where easily cleaned liquids and non sticking products have to be eliminated. Our models UA3, UAB and UAC are made out of high quality stainless steel and cover most possible applications, while we are still pleased to quote for special models designed on individual requirements.



**UA3**

UA3 tank washing heads are the most advanced hygienic devices available for applications in food industry. Designing and realization follow 3-A Sanitary Standard. The electropolishing finish assures a roughness Ra < 0,8 µm required for the devices used in food processing. Used materials follow standard EC 1935/2004 and come under the list of materials indicated by FDA for food application.

Materials B31 AISI 316L s.s.



Code	Connection De x Di (mm x mm)	Connection Pipe Standard DIN 11866	D1 mm	Capacity m3/h 1 bar	Spray Coverage	Dia mm	H mm	WR m
UA3 A040 B31ACA	22,8 x 19,8	DN 15 File A	32	1,90		1,3	63,5	1,7
UA3 C056 B31ACA	32,8 x 29,8	DN 25 File A	50	3,10		2,0	100	2,2
UA3 D098 B31ACA	44,8 x 41,8	DN 40 File A	65	6,20		2,5	117	2,7
UA3 A040 B31BCA	22,8 x 19,8	DN 15 File A	32	2,10		1,3	63,5	2,0
UA3 C056 B31BCA	32,8 x 29,8	DN 25 File A	50	3,20		2,0	100	2,5
UA3 D098 B31BCA	44,8 x 41,8	DN 40 File A	65	6,40		2,5	117	3,0
UA3 A040 B31CCA	22,8 x 19,8	DN 15 File A	32	3,30		1,3	63,5	1,5
UA3 C056 B31CCA	32,8 x 29,8	DN 25 File A	50	5,10		2,0	100	2,0
UA3 D098 B31CCA	44,8 x 41,8	DN 40 File A	65	10,4		2,5	117	2,5
UA3 A026 B31ECA	22,8 x 19,8	DN 15 File A	32	2,60		1,3	63,5	1,0
UA3 C056 B31ECA	32,8 x 29,8	DN 25 File A	50	5,60		2,0	100	1,5
UA3 D193 B31ECA	44,8 x 41,8	DN 40 File A	65	11,0		2,5	117	2,0

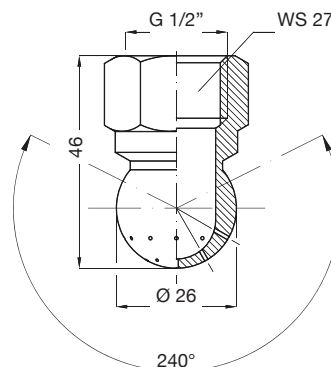


**UAB**

UAB heads are very compact devices, for applications like pipe washing or for cleaning tight spaces. The thick walls of this device, which is machined from solid stainless steel rod, make it also a good choice where the washing process needs to be performed at high pressure values.

BSP thread

Code	Dia mm	D mm	Capacity at different pressures			
			2,0	3,0	4,0	5,0
UAB 2220 xxSG	0,8	26	18,0	22,0	25,3	28,5
UAB 2343 xxSG	1,0		28,0	34,3	39,5	44,3
UAB 2700 xxSG	1,5		57,0	70,0	80,5	90,3
UAB 3110 xxSG	2,0		90,0	110	126	142
UAB 3145 xxSG	2,3		118	145	167	187

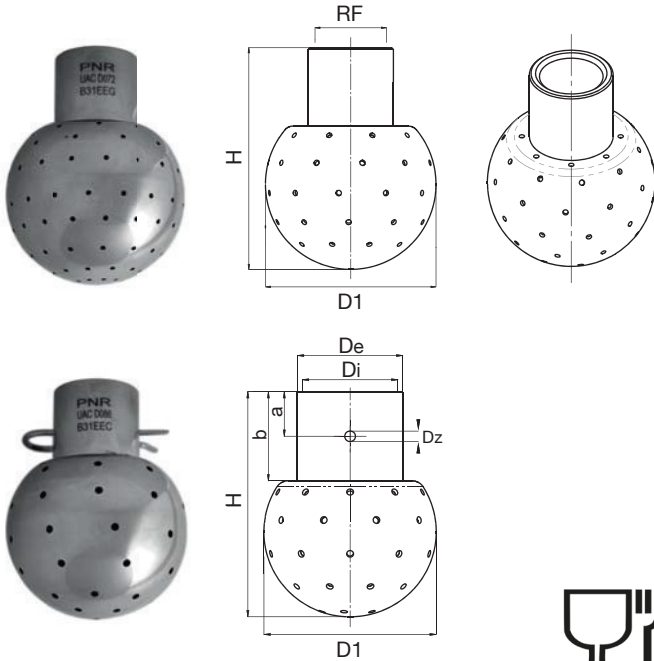


Materials B1 AISI 303 s.s.  
B31 AISI 316L s.s.

# FIXED SPRAY HEADS

## FIXED SPRAY HEADS

## UAC



UAC fixed spray heads are a simple, fast and efficient device for cleaning the inside of small size tanks where a simple rinsing action is required.

Because of the relatively high washing fluid flow rate, they are usually operated at low pressures and can achieve a limited impact action on the tank wall.

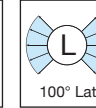
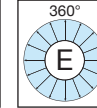
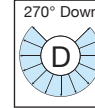
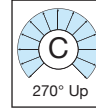
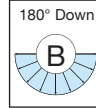
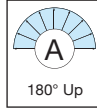
Their simple design allows for the head to be easily cleaned after being operated, which makes it possible to leave the heads permanently in place ready for use.

The values for wetting radiuses shown at the right of the table have been obtained operating the heads with a water pressure value of 1 bar.

On request, heads with electropolishing  $Ra < 0,8 \mu m$  are available, in order to have roughness for alimentary applications.

- Materials B31 AISI 316L s.s.
- L8 Hastelloy C267 (on request)
- H1 Titanium Gr2 (on request)

Connection female thread (BSPP - NPT); clip-on; welded.



Series	Code										Capacity					WR											
	Size available (mm)					Capacity code	Mat.	Spray coverage					Thread dimension		Connection		Capacity at different pressures (bar)										
	D1	A	B	C	D			E	180° up	180° down	270° up	270° down	360°	100° lat	RF		Threaded		Clip-on		Welded		0,5	1,0	1,0	2,0	3,0
	H	a	b	Dz	18"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	Clip/ Welded	BSPP	NPT	Clip-on		Welded	l/min	m³/h	l/min	l/min	l/min	m				
UAC						012	B31	A	B	C*	D*	E*	L*				G	N	C	W	14,0	1,20	20,0	28,0	35,0	0,5	
UAC		A				014	B31	A	B	C*	D*	E*	L*				G	N	C	W	16,0	1,40	23,3	33,0	40,0	0,8	
UAC		A				018	B31	A	B	C*	D*	E*	L*		A			G	N	C	W	21,0	1,80	30,0	42,0	54,0	0,8
UAC		A				021	B31	A	B	C*	D*	E*	L*					G	N	C	W	25,0	2,10	35,0	50,0	61,0	1,0
UAC						031	B31	A	B	C	D	E	L					G	N	C	W	37,0	3,10	51,7	73,0	90,0	1,1
UAC						038	B31	A	B	C	D	E	L		B			G	N	C	W	45,0	3,80	63,3	90,0	110	1,2
UAC						047	B31	A	B	C	D	E	L					G	N	C	W	55,0	4,70	78,3	111	136	0,9
UAC						054	B31	A	B	C	D	E	L					G	N	C	W	64,0	5,40	90,0	127	156	1,0
UAC						063	B31	A	B	C	D	E	L					G	N	C	W	74,0	6,30	105	149	182	1,2
UAC						072	B31	A	B	C	D	E	L					G	N	C	W	85,0	7,20	120	170	208	1,3
UAC						078	B31	A	B	C	D	E	L					G	N	C	W	92,0	7,80	130	184	225	1,5
UAC						086	B31	A	B	C	D	E	L					G	N	C	W	101	8,60	143	203	248	1,6
UAC						092	B31	A	B	C	D	E	L					G	N	C	W	108	9,20	153	217	266	1,6
UAC						102	B31	A	B	C	D	E	L					G	N	C	W	120	10,2	170	240	295	1,7
UAC						110	B31	A	B	C	D	E	L					G	N	C	W	130	11,0	183	250	318	1,8
UAC						123	B31	A	B	C	D	E	L					G	N	C	W	145	12,3	205	290	355	1,8
UAC						132	B31	A	B	C	D	E	L					G	N	C	W	155	13,2	220	310	381	1,9
UAC						157	B31	A	B	C	D	E	L					G	N	C	W	185	15,7	262	370	453	2,0
UAC						160	B31	A	B	C	D	E	L					G	N	C	W	190	16,0	267	277	462	2,0
UAC						175	B31	A	B	C	D	E	L					G	N	C	W	207	17,5	292	413	505	2,1
UAC						209	B31	A	B	C	D	E	L					G	N	C	W	246	20,9	348	492	603	2,4
UAC						217	B31	A	B	C	D	E	L					G	N	C	W	256	21,7	362	512	627	2,5
UAC						228	B31	A	B	C	D	E	L					G	N	C	W	270	22,8	380	537	660	2,7
UAC						242	B31	A	B	C	D	E	L					G	N	C	W	285	24,2	403	570	700	2,8
UAC						286	B31	A	B	C	D	E	L					G	N	C	W	337	28,6	477	675	825	3,0
UAC						321	B31	A	B	C	D	E	L					G	N	C	W	380	32,1	535	755	925	3,1
UAC						371	B31	A	B	C	D	E	L					G	N	C	W	437	37,1	618	875	1070	3,2
UAC						431	B31	A	B	C	D	E	L					G	N	C	W	510	43,1	718	1015	1245	3,4
UAC						491	B31	A	B	C	D	E	L					G	N	C	W	580	49,1	818	1160	1412	3,5

4 Letters marked with \* in "Spray coverage" section state that those models are not available for "Thread Dimension" = 1/8" (letter A).

# FIXED SPRAY HEADS

UAC

FIXED SPRAY HEADS

## HOW TO CREATE THE COMPLETE CODE

Series	Size available (mm)					Capacity code	Mat.	Code						Thread dimension					Connection				Capacity at different pressures (bar)					WR			
	D1	A	B	C	D			E	180° up	180° down	270° up	270° down	360°	100° lat	RF					Threaded	Clip-on	Welded	0,5	1,0	1,0	2,0	3,0				
															1/8"	1/4"	3/8"	1/2"	3/4"										1"	1-1/4"	BSPP
UAC	30	40	50	65	90		AISI 316L	180° up	180° down	270° up	270° down	360°	100° lat	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	Clip/Welded	BSPP	NPT	Clip-on	Welded	0,5	1,0	1,0	2,0	3,0	m
UAC	40	53	65	85	110																										
UAC	8	9,5	11,5	15	19																										
UAC	16	21	23	30	38																										
UAC	2,2	2,5	2,5	2,8	3,3																										
UAC						063	B31	A	B	C	D	E	L									G	N	C	W	74,0	6,30	105	149	182	1,2
UAC						072	B31	A	B	C	D	E	L									G	N	C	W	85,0	7,20	120	170	208	1,3
UAC						078	B31	A	B	C	D	E	L									G	N	C	W	92,0	7,80	130	184	225	1,5

Complete code **UAC C072 B31DEG**

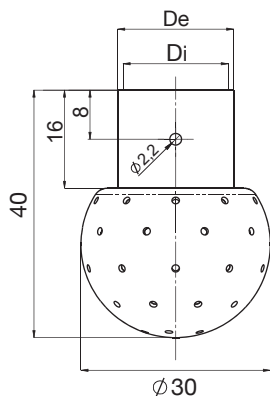
Series **UAC** Fixed spray head  
 Size **C** Diameter 50 mm  
 Capacity code **072** 7,2 [m³/h] @ 1bar  
 Material **B31** AISI 316L  
 Spray coverage **D** 270° down  
 Thread dimension **E** 3/4"  
 Connection **G** BSPP

## Clip-on and welded connection size

In 2016, Standard DIN 11866 gathered some of the most important standards regarding inox pipes. Some of our products can already couple to pipes respondent to these standards. Pipes with dimensions in compliance with obsolete standards are very common, therefore they are still produced without problems by PNR Italia. We are also available to guarantee the connection with every pipe that has a thickness within the standard values. In the following table you can find the dimension we can provide.

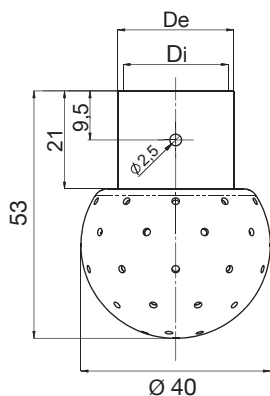


Type A - Ø 30 mm



	CLIP ON		WELDED	
	(De x Di)	Pipe	(De x Di)	Pipe
<b>A</b>	Ø 20 x 18	/	/	/
<b>B</b>	Ø 22 x 20	/	Ø 13,7 x 9,2	ASTM A 213 1/4" 40S
<b>C</b>	Ø 14,5 x 12,5	DN10 - DIN 11850/1	Ø 17,1 x 12,4	ASTM A 213 3/8" 40S
<b>D</b>	Ø 15,5 x 13,5	DN10 - DIN 11886/A	Ø 12 x 10	DN10 - DIN 11886/1
<b>E</b>	Ø 20,5 x 18,5	/	Ø 13 x 10	DN10 - DIN 11886/A
<b>F</b>	Ø 16,2 x 14,2	ASTM A 213 1/4"	Ø 18 x 16	DN15 - DIN 11850/1
<b>G</b>	Ø 19,6 x 17,6	ASTM A 213 3/8"	Ø 19 x 16	DN15 - DIN 11886/A
<b>H</b>	Ø 12 x 10	DN10 - DIN 11886/C	Ø 6,35 x 4,55	DN8 - DIN 11886/C

Type B - Ø 40 mm

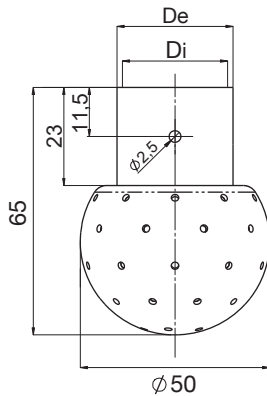


	CLIP ON		WELDED	
	(De x Di)	Pipe	(De x Di)	Pipe
<b>A</b>	Ø 20 x 18	/	Ø 18 x 16	DN15 - DIN 11850/1
<b>B</b>	Ø 22 x 20	/	Ø 19 x 17	DN15 - DIN 11886/A
<b>C</b>	Ø 24,5 x 22,5	DN10 - DIN 11850/1	Ø 17,1 x 12,4	ASTM A 213 3/8" 40S
<b>D</b>	Ø 25,5 x 23,5	DN20 - DIN 11886/A	Ø 21,3 x 15,8	ASTM A 213 1/2" 40S
<b>E</b>	Ø 16,2 x 14,2	ASTM A 213 1/4"	Ø 22 x 20	DN20 - DIN 11850/1
<b>F</b>	Ø 19,6 x 17,6	ASTM A 213 3/8"	Ø 23 x 20	DN20 - DIN 11886/A
<b>G</b>	Ø 23,8 x 21,8	DN15 - DIN 11886/B	Ø 25,4 x 22,2	DN25 - DIN 11886/C

## FIXED SPRAY HEADS

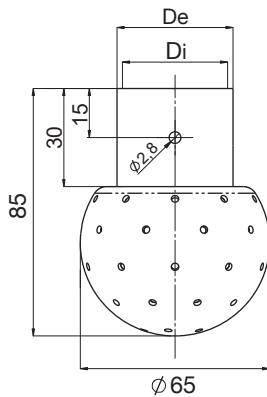
## FIXED SPRAY HEADS

UAC



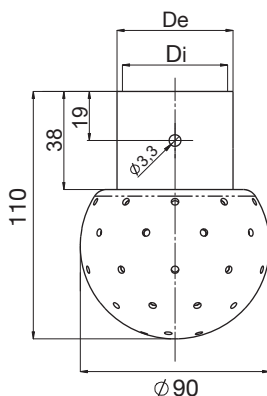
Type C - Ø 50 mm

	CLIP ON		WELDED	
	(De x Di)	Pipe	(De x Di)	Pipe
<b>A</b>	Ø 24,5 x 22,5	DN15 - DIN 11886/B	Ø 22 x 20	DN20 - DIN 11850/1
<b>B</b>	Ø 25,5 x 23,5	DN20 - DIN 11886/A	Ø 23 x 20	DN20 - DIN 11886/A
<b>C</b>	Ø 23,8 x 21,8	DN15 - DIN 11886/B	Ø 21,3 x 15,8	ASTM A 213 1/2" 40S
<b>D</b>	Ø 28 x 26	DN25 - DIN 11886/C	Ø 26,7 x 20,9	ASTM A 213 3/4" 40S
<b>E</b>	Ø 30,2 x 28,2	DN25 - DIN 11886/B	Ø 29 x 26	DN25 - DIN 11850/1
<b>F</b>	Ø 22 x 20	/	Ø 25,4 x 22,2	DN25 - DIN 11886/A
<b>G</b>			Ø 28 x 26	DN25 - DIN 11886/C



Type D - Ø 65 mm

	CLIP ON		WELDED	
	De x Di	Pipe	De x Di	Pipe
<b>A</b>	Ø 30,5 x 28,5	DN25 - DIN 11850/1	Ø 28 x 26	DN25 - DIN 11850/1
<b>B</b>	Ø 31,5 x 29,5	DN25 - DIN 11886/A	Ø 29 x 26	DN25 - DIN 11886/A
<b>C</b>	Ø 36,5 x 34,5	DN32 - DIN 11850/1	Ø 34 x 32	DN32 - DIN 11850/1
<b>D</b>	Ø 28 x 26	DN25 - DIN 11886/C	Ø 35 x 32	DN32 - DIN 11886/A
<b>E</b>	Ø 32 x 30	/	Ø 26,7 x 20,9	ASTM A 213 3/4" 40S
<b>F</b>	Ø 38 x 36	/	Ø 33,4 x 26,6	ASTM A 213 1" 40S
<b>G</b>	Ø 37,5 x 35,5	DN32 - DIN 11886/A	Ø 40 x 38	DN40 - DIN 11850/1
<b>H</b>	Ø 42,5 x 40,5	DN40 - DIN 11850/1	Ø 41 x 38	DN40 - DIN 11886/A
<b>I</b>	Ø 29,2 x 27,2	ASTM A 213 3/4"		
<b>J</b>	Ø 35,9 x 33,9	ASTM A 213 1"		



Type E - Ø 90 mm

	CLIP ON		WELDED	
	De x Di	Pipe	De x Di	Pipe
<b>A</b>	Ø 36,5 x 34,5	DN32 - DIN 11850/1	Ø 34 x 32	DN32 - DIN 11850/1
<b>B</b>	Ø 37,5 x 35,5	DN32 - DIN 11886/A	Ø 35 x 32	DN32 - DIN 11886/A
<b>C</b>	Ø 42,5 x 40,5	DN40 - DIN 11850/1	Ø 40 x 38	DN40 - DIN 11850/1
<b>D</b>	Ø 43,5 x 41,5	DN40 - DIN 11886/A	Ø 41 x 38	DN40 - DIN 11886/A
<b>E</b>	Ø 32 x 30	/	Ø 52 x 50	DN50 - DIN 11850/1
<b>F</b>	Ø 38 x 36	/	Ø 33,4 x 26,6	ASTM A 213 1" 40S
<b>G</b>	Ø 54,5 x 52,5	DN50 - DIN 11850/1	Ø 42,2 x 35	ASTM A 213 1-1/4" 40S
<b>H</b>	Ø 55,5 x 53,5	DN50 - DIN 11886/A	Ø 48,2 x 40,9	ASTM A 213 1-1/2" 40S
<b>I</b>	Ø 35,9 x 33,9	ASTM A 213 1"	Ø 60,3 x 52,5	ASTM A 213 2" 40S
<b>J</b>	Ø 44,7 x 42,7	ASTM A 213 1-1/4"	Ø 53 x 50	DN50 - DIN 11886/A
<b>K</b>	Ø 50,8 x 48,8	ASTM A 213 1-1/2"	Ø 38,1 x 34,9	DN40 - DIN 11886/C
<b>L</b>	Ø 62,8 x 60,8	ASTM A 213 2"		



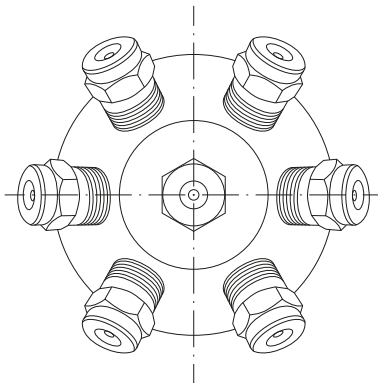
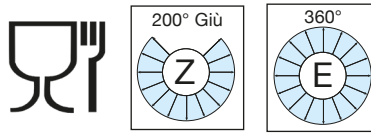
# FIXED SPRAY HEADS

## FIXED SPRAY HEADS

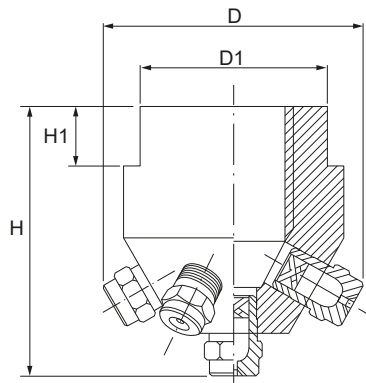
CH series includes large and small capacities full cone cluster nozzles. They make a cluster spray pattern and are available in 7 and 13 nozzles versions. Several nozzles are assembled on one nipple with small volume and wide spray coverage. The droplets size is 1/3-1/2 compared to those produced by a single nozzle with same capacity. An added value to CH full cone nozzle is their wide spray range.

**Materials** B1 AISI 303 s.s.  
 B31 AISI 316L s.s.  
 T1 Brass

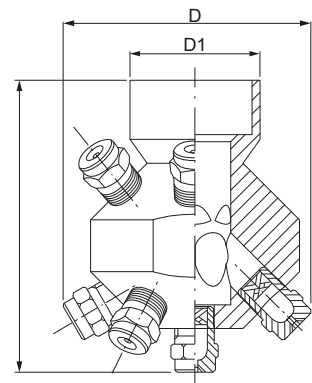
**Thread** Standard BSP  
 Standard NSP



Bottom view



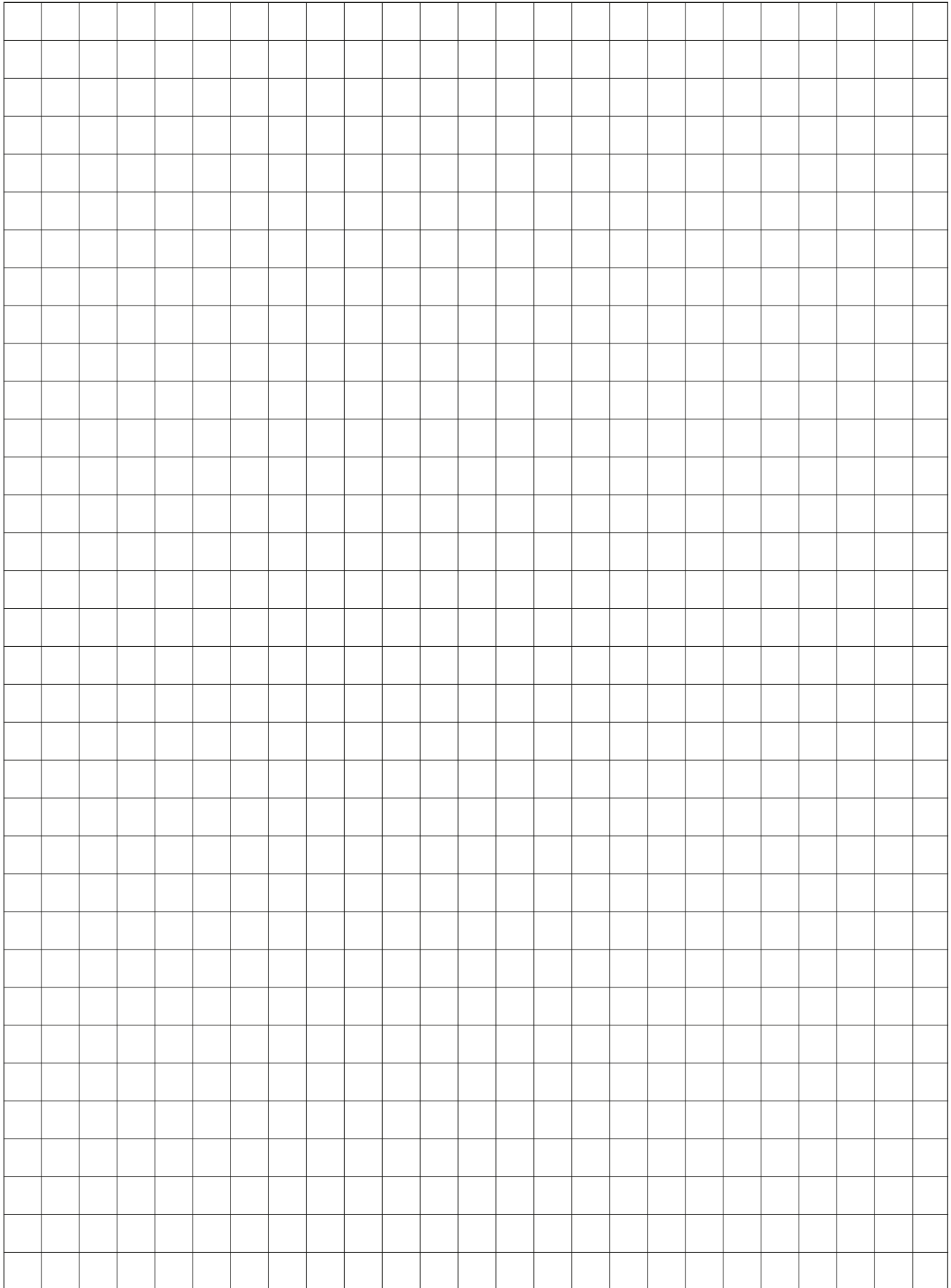
CH tank washer with 7 nozzles



CH tank washer with 13 nozzles

Code	Capacity at different pressures					Spray coverage		RF BSP				Dimensions mm				Number of nozzles
	1,0	2,0	3,0	5,0	10	200	360	3/4"	1"	1-1/2"	2"	D	D1	H	H1	
CHZ 1826 xx	4,77	6,47	8,26	10,7	15,1	•		•				71	40	55	13	7
CHZ 2165 xx	9,53	13,5	16,5	21,3	30,1	•		•								
CHZ 2329 xx	19,0	26,9	32,9	42,5	60,1	•			•			89	46	68	17	
CHZ 2585 xx	33,8	47,8	58,5	75,5	106	•			•							
CHZ 2819 xx	47,3	66,9	81,9	106	150	•			•							
CHZ 3102 xx	59,4	84,0	102	133	188	•				•		128	70	93	20	
CHZ 3131 xx	76,0	107	131	170	240	•				•						
CHZ 3206 xx	119	168	206	267	377	•					•	171	85	122	27	
CHZ 3259 xx	149	211	259	334	473	•					•					
CHZ 3329 xx	190	268	329	425	600	•					•					
CHE 2153 xx	8,83	12,5	15,3	19,8	27,9		•	•				69	39	85	-	13
CHE 2306 xx	17,7	25,0	30,6	39,5	55,9		•	•								
CHE 2611 xx	35,3	49,9	61,1	78,9	111		•		•			86	48	105	-	
CHE 3108 xx	62,7	88,7	108	140	198		•		•							
CHE 3152 xx	87,8	124	152	196	277		•		•							
CHE 3191 xx	110	156	191	246	349		•			•		98	55	120	-	
CHE 3245 xx	141	200	245	316	447		•			•						
CHE 3383 xx	221	313	383	495	700		•				•	129	73	159	-	
CHE 3481 xx	277	392	481	621	878		•				•	169	95	206	-	

# NOTES



This section contains a large grid of 25 columns and 25 rows, intended for taking notes. The grid is composed of small, empty square cells.

**SINGLE AXIS HEADS**

**REACTION DRIVE**

The washing action is obtained through water jets coming from a rotating head, where the head motion is obtained purely through reaction force originated by the fluid jets being ejected.

The operating pressure influences the head rotation speed, which must be limited to avoid the water jets being broken into minute droplets and losing part of their impact force.

These devices perform very satisfactorily in a great number of general applications, where the products to be washed away do not originate severe problems and with limited size tanks.

To cope with the large variety of industrial applications we offer heads made out completely of stainless steel, out of PTFE, PVDF or a mix of those materials.

Connections are obtained through female thread or easy to clean clip fix slip-on pipe.



Page 10

**MOTOR DRIVE**

A further step in performance with one axis heads performance is obtained with a design where a very simple friction motor provides for low speed rotating head.

This design offers a remarkable advantage because of the lower rotation velocity: the jets remain coherent without being broken into droplets by centrifugal force and all of their impact energy can be transferred to the tank surface.

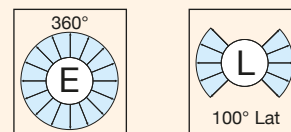
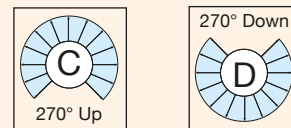
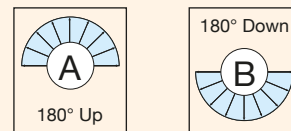


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**SPRAY ANGLES**

All the spray angle values given in this catalog are to be understood for heads hanging from the tank top and spraying downwards.

Therefore the definitions of Up and Down assigned to a given spray angle of a tankwasher always refer to the same direction as the upper and lower part of the tank, when the tankwasher is located at the tank top. See the diagrams beside for reference.



**CONNECTION DIMENSIONS**

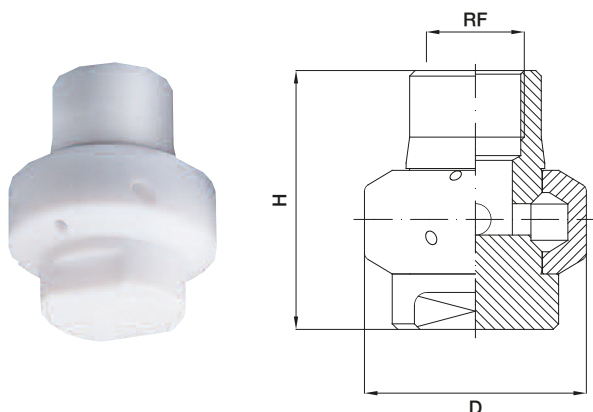
Tankwashers are often requested with a clip connection for quick disassembly and for easy cleaning of the components. They are also available with a weld connection.

Our standard dimensions for these two popular designs are given at page 24.

# SINGLE AXIS HEADS

## REACTION DRIVE

## UBB



UBB heads are specially designed for applications where chemical attack from strong acids is to be expected, or when contamination to the product being handled is to be excluded, and are therefore entirely made out of PTFE.

Their rotary motion is produced from the reaction forces of their solid stream water jets, which are arranged in such a way that the inner tank surface is thoroughly covered when the head rotor is in motion.

The simple design, a two-piece construction, assures for long, maintenance free service.

The wide range of capacities and the choice among several spray patterns makes it easy to find the right product to suite a variety of different applications.

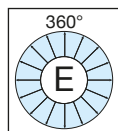
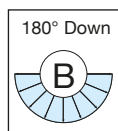
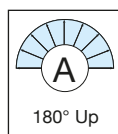
The codes shown in the capacity table refer to BSP threads. Our offices can supply coding for products designed with NPT threads.



**Materials** E1 PTFE (FDA approved)  
**LT** 95° C  
**LP** 4.0 bar

### BSP Thread Connection

Code	RF BSP	Capacity at different pressures					Size mm	
		1,5	2,0	2,5	3,0	3,5	H	D
UBB 0003 E1xG	1/2"	21,5	24,7	27,5	30,0	32,3	60	50
UBB 0004 E1xG	3/4"	22,9	26,3	29,3	32,0	34,5	70	60
UBB 0007 E1xG		50,2	57,6	64,1	70,0	75,4		
UBB 0012 E1xG		86,0	98,8	110	120	129		
UBB 0018 E1xG		130	150	167	182	196		
UBB 0020 E1xG	1"	143	165	183	200	215	75	70
UBB 0027 E1xG		197	225	252	275	296		
UBB 0035 E1xG		255	292	325	355	382		
UBB 0039 E1xG	2"	283	325	362	395	425	110	125
UBB 0049 E1xG		355	407	454	495	533		
UBB 0059 E1xG		423	486	541	590	635		
UBB 0069 E1xG		495	568	632	690	743		
UBB 0098 E1xG	3"	706	811	902	985	1061	150	175
UBB 0118 E1xG		846	971	1081	1180	1271		
UBB 0138 E1xG		989	1136	1264	1380	1486		



In order to obtain the complet code of the tank washing head, you need to change the "x" letter, in second to last position, with the corresponding letter concerning the spray coverage, among the ones available.

SINGLE AXIS HEADS

UBC

REACTION DRIVE

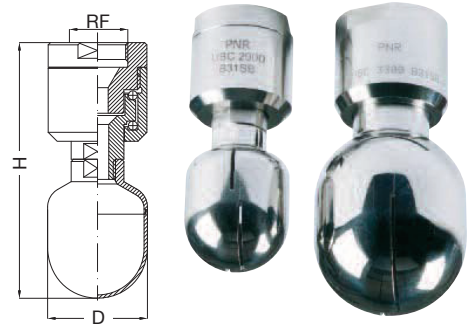
UBC series heads are completely made out of stainless steel, with the rotating sphere rolling on two ball bearing rows, to make operation possible in any position.

Inner and outer surfaces are carefully machined, deburred, cleaned and polished to a precisely defined roughness grade to avoid contamination from bacterial growth.

UBC series heads are available with different connection designs, that is a female thread and a clip-on connection as standard, a weld-on or a tri-clamp connection on request.

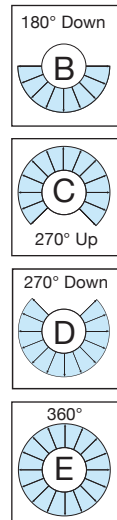
The robust and simple design, the high quality construction, long trouble-free service and remarkable efficiency have made them very popular for general purpose applications, in thousands of applications all over the world.

Materials B31 AISI 316L s.s.



Female BSP Thread

Code	Capacity at different pressures l/min bar				Spray coverage				RF BSP					Size mm	
	2,0	3,0	5,0	7,0	360	270U	270D	180D	3/8"	1/2"	3/4"	1"	1-1/4"	H	D
UBC 2100 B31xG	8,16	10,0	12,9	15,3	•	•	•	•	•					55	25
UBC 2300 B31xG	24,5	30,0	38,7	45,8	•	•	•	•	•						
UBC 2480 B31xG	39,2	48,0	62,0	73,3	•	•	•	•	•					115	45
UBC 2629 B31xG	51,4	63,0	81,3	96,2	•	•	•	•	•						
UBC 2899 B31xG	73,5	90,0	116	137	•	•	•	•	•					131	65
UBC 2630 B31xG	51,4	63,0	81,3	96,2	•	•	•	•	•						
UBC 2900 B31xG	73,5	90,0	116	137	•	•	•	•	•					46	22
UBC 3135 B31xG	110	135	174	206	•	•	•	•	•						
UBC 3120 B31xG	98,0	120	155	183	•	•	•	•	•					RG BSPT	
UBC 3215 B31xG	176	215	278	328	•	•	•	•	•						
UBC 3300 B31xG	245	300	387	458	•	•	•	•	•						



Male BSPT Thread

UBC 2230 B31EGZ	18,9	23,0	29,4	34,5
-----------------	------	------	------	------

Clip-on connection

Available on request with American pin. Last letter of the code: D instead of C.

Code	Capacity at different pressures l/min bar				Spray coverage				Pipe Connection	Clip-on Pipe	Standard	Size mm	
	2,0	3,0	5,0	7,0	360	270U	270D	180D	De x Di (mm)			H	D
UBC 2480 B31xC	39,2	48,0	62,0	73,3	•	•	•	•	22 x 20	3/4"	ASTM A240	70	25
UBC 2630 B31xC	51,4	63,0	81,3	96,2	•	•	•	•	29 x 25,3	DN 25	SMS 3008	135	45
UBC 2900 B31xC	73,5	90,0	116	137	•	•	•	•	29 x 25,3	DN 25	SMS 3008	137	45
UBC 3120 B31xC	98,0	120	154	183	•	•	•	•	29 x 25,3	DN 25	SMS 3008	135	45
UBC 3135 B31xC	110	135	174	206	•	•	•	•	29 x 25,3	DN 25	SMS 3008	137	45
UBC 3178 B31xC	145	178	230	272	•	•	•	•	29 x 25,3	DN 25	SMS 3008	137	44,5
UBC 3300 B31xC	245	300	387	458	•	•	•	•	44 x 38,4	DN 40	SMS 3008	159	65

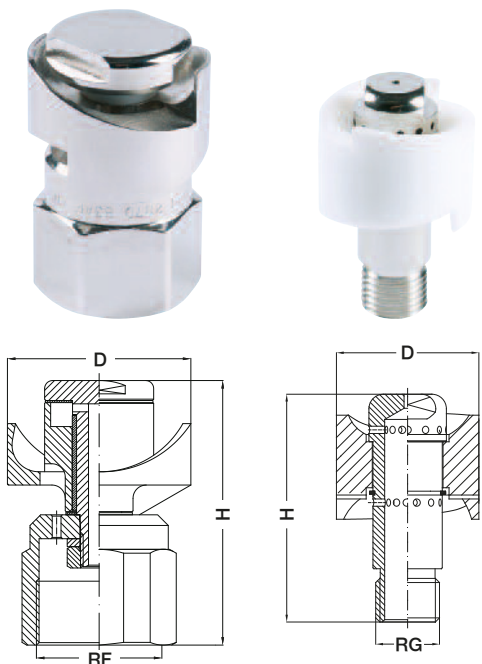
Welded connection

Code	Capacity at different pressures l/min bar				Spray coverage				Pipe Connection	DN	Standard	Size mm	
	2,0	3,0	5,0	7,0	360	270U	270D	180D	De x Di (mm)			H	D
UBC 2200 B31xS	16,3	20,0	25,8	30,6	•	•	•	•	12,7 x 1,65	DN 10	DIN 11866/C	69	25
UBC 2300 B31xW	24,5	30,0	38,7	45,8	•	•	•	•	19,05 x 1,65	DN 15	DIN 11866/C	78	25
UBC 2630 B31xW	51,4	63,0	81,3	96,2	•	•	•	•	25 x 2	DN 25	DIN 11866/C	250	45
UBC 2900 B31xW	73,5	90,0	116	137	•	•	•	•	25 x 2	DN 25	DIN 11866/C	250	45
UBC 3120 B31xS	98,0	120	155	183	•	•	•	•	25 x 2	DN 25	DIN 11866/C	250	45
UBC 3135 B31xV	110	135	174	206	•	•	•	•	29 x 1,5	DN 25	DIN 11866/A	250	45
UBC 3300 B31xW	245	300	387	458	•	•	•	•	38 x 34	DN 40	DIN 11866/C	250	65

# SINGLE AXIS HEADS

## REACTION DRIVE

## UBD



UBD rotary heads can profit from the special design of their rotary head, which allows for a very even water distribution, assuring optimum surface coverage. They assure therefore very short washing cycles, using lower quantities of water, with a definite advantage in those applications where recycled water is not allowed as a washing medium, and the volumes sent to disposal must be kept to a minimum. UBD heads work using Teflon slide bearings floating at high speed over a thin water film, the only wear part being an easily replaceable Teflon washer. Only a fraction of the liquid energy is then used to power the washing head, while the high speed of the rotating disc produces instantly a cloud of high energy droplets all over the inside surface of the tank. The clever design of this device results in no maintenance at all being necessary. Large inside passages are not easily subject to plugging while an extremely simple design with only one moving part avoids any internal jamming. All inside and outside surface are carefully polished, for fast and easy sanitizing. The two following tables give data about types with threaded connection and clip-on types.

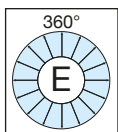
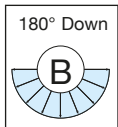
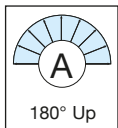
**Materials**  
 Body, shaft and rotary head B31 AISI 316L s.s.  
 L61 Hastelloy C22

**Bearings** E1 PTFE



### Thread connection

Code	Capacity at different pressures					l/min bar	Spray coverage			RG BSPT		RF BSP		Size mm	
	2,0	3,0	4,0	5,0	7,0		180°U	180°D	360°	1/4"	3/4"	1"	1-1/2"	H	D
UBD 0035 B31AG	29,0	35,0	40,0	45,0	53,0		•			•				45	28
UBD 0035 B31BG	29,0	35,0	40,0	45,0	53,0			•		•					
UBD 0035 B31EG	29,0	35,0	40,0	45,0	53,0				•						
UBD 0050 B31AG	41,0	50,0	58,0	64,0	76,0		•			•					
UBD 0050 B31BG	41,0	50,0	58,0	64,0	76,0			•		•					
UBD 0050 B31EG	41,0	50,0	58,0	64,0	76,0				•	•					
UBD 0051 B31AG	41,0	50,0	58,0	64,0	76,0		•				•		55	38	
UBD 0051 B31BG	41,0	50,0	58,0	64,0	76,0			•			•				
UBD 0051 B31EG	41,0	50,0	58,0	64,0	76,0				•						
UBD 0090 B31AG	73,0	90,0	104	116	137		•				•				
UBD 0090 B31BG	73,0	90,0	104	116	137			•			•				
UBD 0090 B31EG	73,0	90,0	104	116	137				•						
UBD 0091 B31AG	73,0	90,0	104	116	137		•					•	75	50	
UBD 0091 B31BG	73,0	90,0	104	116	137			•			•				
UBD 0091 B31EG	73,0	90,0	104	116	137				•						
UBD 0140 B31AG	114	140	162	181	214		•					•			
UBD 0140 B31BG	114	140	162	181	214			•				•			
UBD 0140 B31EG	114	140	162	181	214				•						
UBD 0141 B31AG	114	140	162	181	214		•					•	100	70	
UBD 0141 B31BG	114	140	162	181	214			•				•			
UBD 0141 B31EG	114	140	162	181	214				•						
UBD 0210 B31AG	171	210	242	271	321		•					•			
UBD 0210 B31BG	171	210	242	271	321			•				•			
UBD 0210 B31EG	171	210	242	271	321				•						



The rotor of 1/4" BSPT model is made of Teflon.

Models with 3/4", 1", 1-1/2" connections can be provided also with NPT thread: in this case, H can be slightly different.

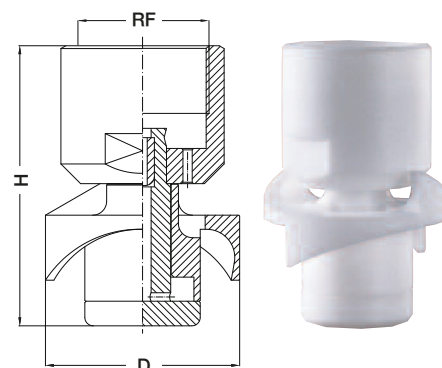
Models with clip-on connection are available on request. See page 24 for the size of UBD clip connections.

**SINGLE AXIS HEADS**

**UBD A**

**REACTION DRIVE**

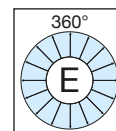
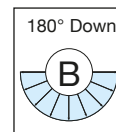
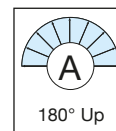
UBD A rotary heads are a simple but very efficient device for the inside cleaning of tanks. The rotary disk is rotated through the action of the cleaning fluid and produces a very dense spray which reaches all parts of the inside surface, it is the only mobile part of the unit and requires no servicing at all. No lubrication is required, and therefore no risk exists of contaminating your product with oil or grease. The device is not easily clogged tanks to a minimum internal passage of 2 mm dia, and will continue to operate even when feed holes are partially closed. Ideally suited for aggressive environments, it operates efficiently with all detergents and chemical solutions, in both closed and open tanks because available with 360 or 180 degrees spray patterns. UBD A models find their application in pharmaceutical, chemical and food industries, where pure PTFE complies with the requirements of FDA CFR21. Models made out of Graphite-filled PTFE do not allow for the build up static electricity and can be employed in atmospheres where an explosion risk occurs.



Materials E1 PTFE pure (FDA approved) LT 95° C  
 E11 PTFE + 25% graphite  
 D9 PEEK (FDA approved)

**Thread connection**

Code	Capacity at different pressures					Spray coverage			RF BSP				Size mm	
	2,0	3,0	4,0	5,0	6,0	360	180U	180D	1/4"	3/4"	1"	1-1/2"	H	D
UBD A035 xxEG	28,6	35,0	40,5	45,2	49,5	•			•				47	30
UBD A051 xxEG	41,2	50,0	57,4	63,9	69,7	•				•			55	40
UBD A090 xxEG	73,5	90,0	104	116	127	•				•			49	40
UBD A090 xxAG	73,5	90,0	104	116	127		•			•				
UBD A090 xxBG	73,5	90,0	104	116	127			•		•			75	50
UBD A140 xxEG	114	140	162	180	198	•					•			
UBD A140 xxAG	114	140	162	180	198		•				•			
UBD A140 xxBG	114	140	162	180	198			•			•		100	70
UBD A210 xxEG	171	210	243	271	296	•						•		
UBD A210 xxAG	171	210	243	271	296		•					•		
UBD A210 xxBG	171	210	243	271	296			•				•		

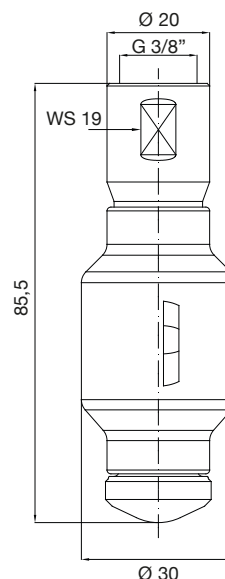
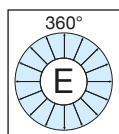


**UBD S**

Reaction drive mono-axial head UBD S035 B31EG is totally realized in AISI 316L stainless steel. Moreover, no lubrication is needed, therefore there is no risk of contamination with oils: this product is suitable in applications in food, pharmaceutical and chemical industries.

It has a low capacity and low angular velocity, so it is perfect for washing small and medium size tanks that require longer washing cycles. The easy and strong design, and high quality structure assure a long service and a high efficiency.

Materials B31 AISI 316L s.s.  
 Connection 3/8" Female BSP  
 LT 95° C

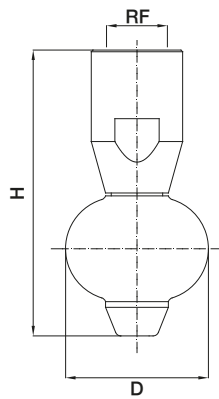


Code	Capacity at different pressures									l/min bar
	2,0	3,0	4,0	5,0	6,0	7,0	10	15	20	
UBD S035 B31EG	29	35	40	45	50	53	63	76	88	

# SINGLE AXIS HEADS

## REACTION DRIVE

## UBX



UBX is a very compact product whose design provides for a specially accurate cleaning of the upper area of the tank around the inlet pipe, which is accomplished by a larger rotating head and straight jets with a well studied and appropriate orientation.

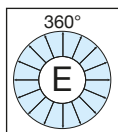
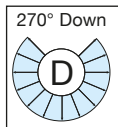
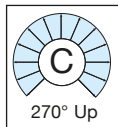
Because of the low flow values, the simple design and the high quality surface finish UBX tankwashers are preferred in such application as washing small volume tanks in pharmaceutical processes.

The rotation is obtained by liquid reaction forces, while the head rotates over a thin liquid film which is self-cleaning.

Connection can be threaded or with standard PNR clip for easy disassembly and cleaning.

**Materials** Body B31 AISI 316L s.s.  
Rotor E1 PTFE  
E13 PTFE + Carbon  
D9 PEEK (on request)

### Thread connection



Code	Capacity at different pressures					l/min bar	Spray coverage			RF BSP				Size mm		
	2,0	3,0	4,0	5,0	6,0		360	270U	270D	1/4"	3/8"	1/2"	3/4"	H	D	
UBX A10S B31EG	8,20	10,0	11,6	12,9	14,1		•			•				50	25	
UBX A10A B31DG	8,20	10,0	11,6	12,9	14,1			•	•							
UBX A15S B31EG	12,2	15,0	17,3	19,4	21,2		•		•							
UBX A20C B31CG	16,3	20,0	23,1	25,8	28,3			•	•							
UBX A20S B31EG	16,3	20,0	23,1	25,8	28,3		•			•				60	30	
UBX A20S B31CG	16,3	20,0	23,1	25,8	28,3			•	•							
UBX A20S B31 DG	16,3	20,0	23,1	25,8	28,3				•	•						
UBX A30A B31EG	24,5	30,0	34,6	38,7	42,4		•			•						
UBX A30A B31DG	24,5	30,0	34,6	38,7	42,4					•				75	40	
UBX A30S B31EG	24,5	30,0	34,6	38,7	42,4		•			•						
UBX A30S B31CG	24,5	30,0	34,6	38,7	42,4			•		•						
UBX A30S B31DG	24,5	30,0	34,6	38,7	42,4					•						
UBX A40A B31EG	32,7	40,0	46,2	51,6	56,6		•				•			100	50	
UBX A40S B31EG	32,7	40,0	46,2	51,6	56,6		•				•					
UBX A40S B31CG	32,7	40,0	46,2	51,6	56,6			•			•					
UBX A40S B31DG	32,7	40,0	46,2	51,6	56,6						•					
UBX A50S B31EG	40,8	50,0	57,7	64,5	70,7		•					•				
UBX A70A B31EG	57,1	70,0	80,8	90,4	99,0		•						•			
UBX A70S B31EG	57,1	70,0	80,8	90,4	99,0		•						•			
UBX A70A B31CG	57,1	70,0	80,8	90,4	99,0			•					•			
UBX A70A B31DG	57,1	70,0	80,8	90,4	99,0								•			



**SINGLE AXIS HEADS**

**UBF - SMALL DIMENSION WASHING HEADS**

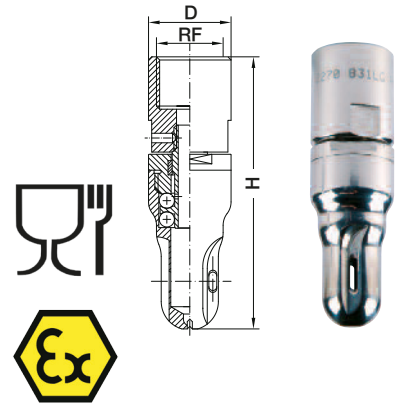
UBF range heads have been designed as small dimensions devices to be operated through small dimension openings and perform such processes as the inside cleaning of any other container where standard washing heads cannot be used. Typically used for cleaning beer kegs, containers for soft drinks or small bore pipes.

**Materials** B31 AISI 316L s.s.

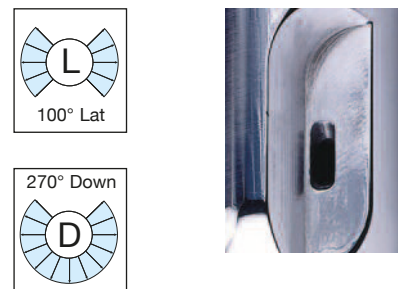
**EXCLUSIVE TRUMPET ORIFICE**

The new trumpet design of the side orifices allows to obtain a more efficient fan shaped jet, with a well defined spray angle, improving considerably the washing action. Italian and International Patents applied for.

**REACTION DRIVE**



Code	RF BSP	Capacity at different pressures					l/min bar	Spray coverage		Size mm	
		2,0	3,0	5,0	10	12		100L	270D	H	D
UBF 2270 B31LG	1/2"	20,0	27,0	36,4	51,5	56,4	•		85	26	
UBF 2270 B31DG		22,0	27,0	36,4	51,5	56,4		•			
UBF 2380 B31DG		31,0	38,0	49,2	69,3	76,0		•			

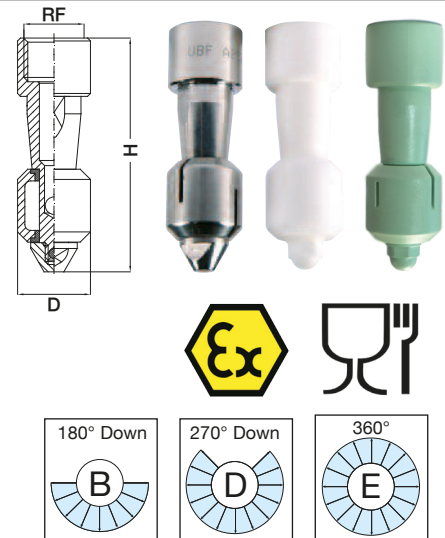


**UBF A**

Designed for cleaning processes in small bore piping or small size containers and available in a range of different plastic materials and special alloys, as well as with several spray angles.

**Materials** D82 PVDF (molded)  
B31 AISI 316L s.s.  
E1 PTFE (FDA approved)  
L61 Hastelloy C22

Code	RF BSP	Capacity at diff. pressures			l/min bar	Spray coverage			Size mm	
		2,0	3,0	4,0		180D	270D	360	H	D
UBF A250 xxBG	1/2"	20,0	25,0	28,8	•			80	25	
UBF A250 xxDG		20,0	25,0	28,8		•				
UBF A250 xxEG		20,0	25,0	28,8			•			

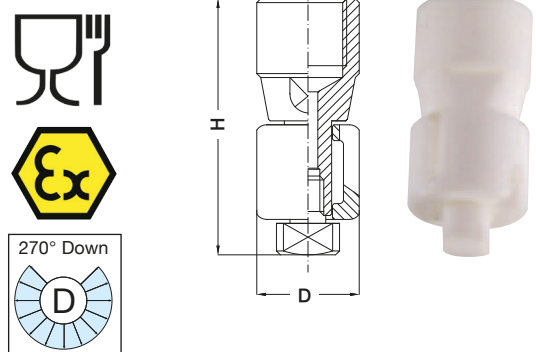


**UBF S**

Designed for cleaning processes in very small bore piping or containers, down to 13 mm diameter. The device is available in different materials as well as spray angles.

**Materials** B31 AISI 316L s.s.  
E1 PTFE (FDA approved)

Code	RF BSP	Capacity at diff. pressures			l/min bar	Spray coverage	Size mm	
		2,0	3,0	4,0			H	D
UBF S055 xxDG	1/8"	4,50	5,50	6,40	•	270D	32	13



# SINGLE AXIS HEADS

## MOTOR DRIVE

## UBA



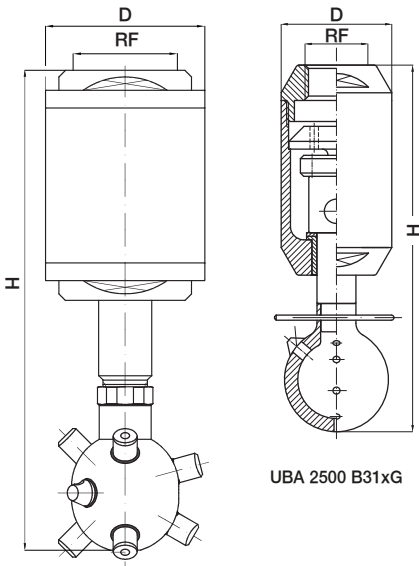
UBA series heads operate producing water jets out of a spray head rotating around a vertical axis, but feature a sophisticated design where the head is put in slow motion by a simple friction transmission.

As the motor produces a low rotation velocity, the jets can work with their maximum efficiency since not being broken into droplets: this makes it possible to obtain a higher impact force onto the tank wall. The head design can include one jet directed upwards which is meant to clean the tank roof area around the feed pipe, a difficult area in many instances, realizing then a true 360° spray pattern.

Superior cleaning power, faster cleaning cycles and lower volumes of cleaning solution required. UBA washing heads are available in two sizes, and three different jet patterns, as shown below.

Rotation speed varies, depending upon feed pressures, between 5 and 12 rpm. Thread connection are available both in BSP standard (last letter of the code: G) and NPT standard (last letter of the code: N).

Materials	Body, sphere	B31	AISI 316 s.s.
		E1	PTFE (only model 3150)
	Bushings	E1	PTFE
	Motor ring	E1	PTFE



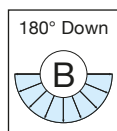
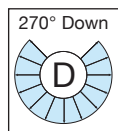
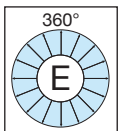
UBA 3150 B31EG

UBA 2500 B31xG

Size	RF BSP	Capacity at different pressures				Spray coverage			Size mm	
		3,0	5,0	7,0	10	180D	270D	360	H	D

UBA 2500 B31BG	3/4"	50,0	64,5	76,3	91,3	•			166	50
UBA 2500 B31DG		50,0	64,5	76,3	91,3		•			
UBA 2500 B31EG		50,0	64,5	76,3	91,3			•		
UBA 3150 B31EG	1-1/2"	110	142	168	200			•	216	71

UBA tank washing head is designed to accommodate, on its head, a wide range of different nozzles, both as number and type (flat fan, straight, etc.). Every personalization involves some difference in the performance compared to the ones in the table: they will be provided case by case.



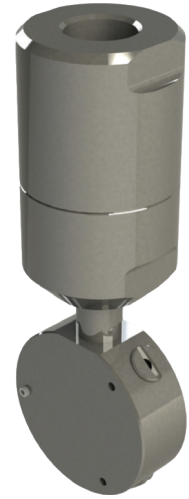
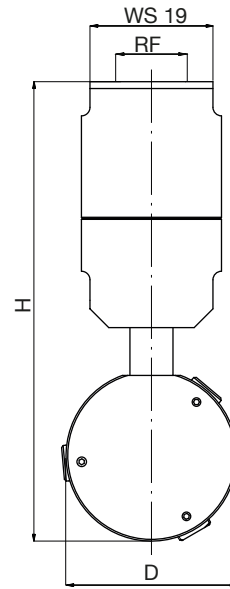
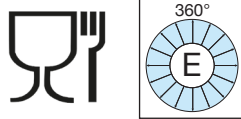
SINGLE AXIS HEADS

UBE

MOTOR DRIVE

These devices, with monoaxial rotation, are particularly suitable when you need a high impact wash using small quantities of water. On the rotating head there are three nozzles with fan jet that offer an extremely uniform and high impact covering. Moreover, the special internal mechanism allows a slow and constant rotation, ideal for obtaining maximum washing power from flat jets. Available in both PVDF and AISI 316L, UBE tank washing head proves to be a robust and durable washing device, perfect for cleaning and sanitization in most industrial applications.

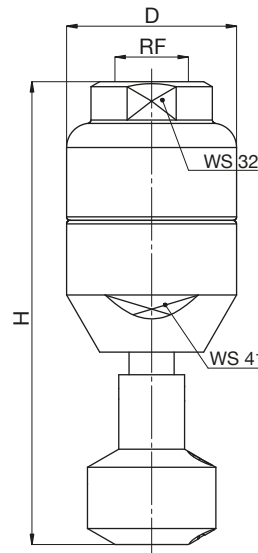
Materials B31 AISI 316L s.s.  
D81 PVDF



M018

BSP thread connection

Code	RF BSP	Capacity at different pressures					Size mm	
		1,5	2,0	2,5	3,0	3,5	H	D
UBE M018 B31EG	1/2"	12,9	14,8	16,5	18,0	19,4	144	50
UBE P018 D81EG		12,9	14,8	16,5	18,0	19,4	144	49
UBE P040 D81EG		28,7	32,9	36,6	40,0	43,1	146	49



P018 - P040

## TWIN AXIS HEADS

### TWIN AXIS HEADS

The most sophisticated tank washing equipment, where high impact fluid jets slowly move with a combined rotation around one vertical and one horizontal axis.

The motive mechanism assures the jet to hit always different paths at each turn, so that each single point of the inner tank surface is surely cleaned.

### TURBINE DRIVE

Sophisticated products offering modern design, excellent performance and high surface quality, mainly suitable for the chemical and pharmaceutical industry as they fully satisfy their demand for safe and reliable operation as well as perfect cleaning and sanitation.



TWIN AXIS HEADS

UBT

The UBT series tank wash heads are very sophisticated devices, designed with a robust structure and constructed with the latest technology to allow for high performance and providing excellent disinfection after each wash cycle. These characteristics are ideal for the automatic cleaning of industrial tanks and vessels.

The nozzle movement is operated through an internal epicyclical gear reducer which enables to drive the jet paths according to a preset grid over the tank surface, providing a perfect cleaning of every single area inside the tank. Each side hub is equipped with two nozzles.

Depending on the application, two different types of nozzle can be used:

- Short nozzle: length 20 mm (Model C)
- Long nozzle: length 50 mm (Model L)

Each side hub is equipped with two nozzles whose orifice diameter determines the total water flow rate.

Operating conditions:

- LT 90°C
- LP 10 bar

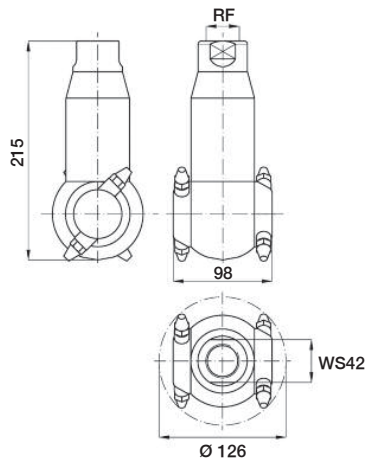
Materials Metal parts AISI 316L s.s.  
 Seals PTFE Teflon + graphite  
 Other minor parts PEEK

Connection Female BSPP Thread (ISO 228)

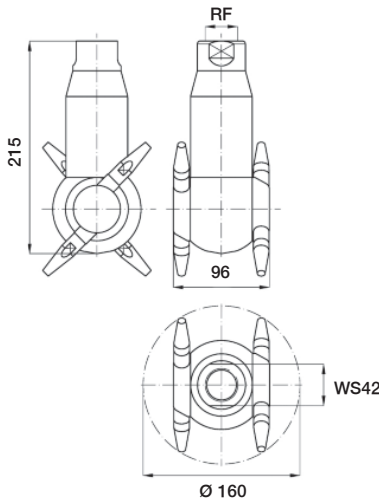
In order to avoid problems with the device (such as breaking), we suggest to you filtered water. PNR Italia suggests a filter with at least 60 mesh, such as VEM 0100 V1 (see next page for further information).



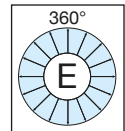
TURBINE DRIVE



Model C: "short"



Model L: "long"



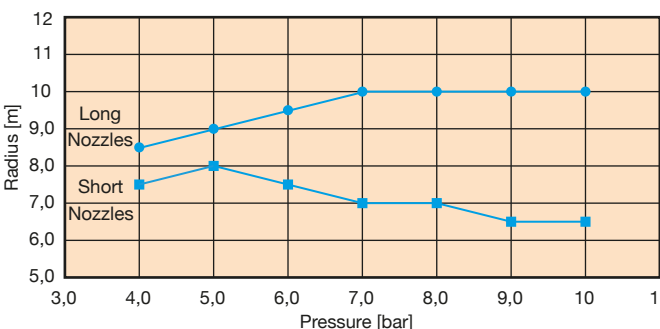
To order the required product, please note that:

- a) second to last letter "C" indicates the Model C (short nozzle);
- b) second to last letter "L" indicates the Model L (long nozzle).

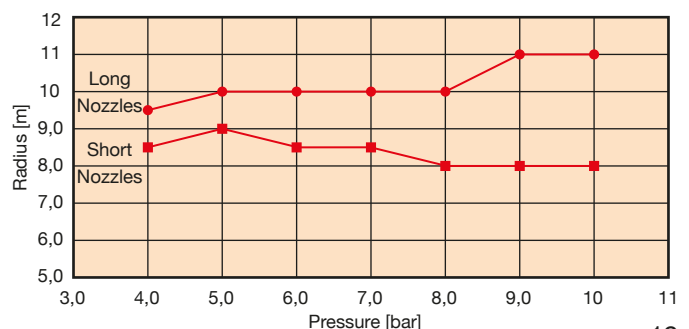
Ø is the nozzle diameter.

Code	Ø mm	RF BSPP	Capacity at different pressures							Weight Kg
			4,0	5,0	6,0	7,0	8,0	9,0	10	
UBT S445 B31CG	6,0	1"	88	92	100	108	115	121	130	3,6
UBT S445 B31LG			88	92	100	108	115	121	130	
UBT S460 B31CG			115	120	130	138	150	158	162	
UBT S460 B31LG			115	120	130	138	150	158	162	

Wetting radius UBT S445

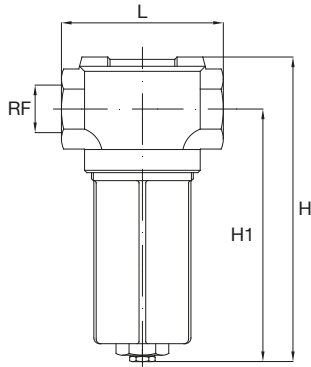


Wetting radius UBT S460



## AUXILIARY WASHING EQUIPMENTS

### IN-LINE FILTER



### VEM

VEM filters have been designed for high efficiency and ease of maintenance under hard conditions.

The bowl houses large size cartridges, to extend periods of operation and reduce maintenance time, and has a thread connection to the body for quick removal without the aid of tools.

Finally, a plug at the bottom of the bowl allows for fitting a ball valve to bleed the filter.

#### Materials

Body	V1	Aluminium casting
Bowl	V1	Aluminium casting
Cartridge	B2	AISI 304 s.s.
Cap	A8	Zinc-coated steel
Seal	E0	EPDM

### FILTER CARTRIDGE

In the table, you find the code of the cartridges available for every filter.

The column "M" near the cartridge code show the value of filtration, in number of mesh.

Mesh number	Free passage mm
30	0,60
60	0,25
80	0,18
100	0,15

Code	RF poll BSP	H mm	H1 mm	L mm	LP bar	Q l/min	Cartridge	M mesh	W kg
VEM 0050 V1 VEM 0051 V1	1/2"	213	168	105	40	70	XVE M075 B2 XVE M076 B2	60 80	0,9
VEM 0075 V1 VEM 0076 V1	3/4"	213	168	105	40	95	XVE M075 B2 XVE M076 B2	60 80	
VEM 0100 V1 VEM 0101 V1 VEM 0102 V1	1"	213	168	105	40	140	XVE M075 B2 XVE M076 B2 XVE M077 B2	60 80 100	
VEM 0125 V1 VEM 0126 V1	1-1/4"	278	233	140	30	280	XVE M150 B2 XVE M151 B2	60 80	1,6
VEM 0150 V1 VEM 0151 V1	1-1/2"	278	233	140	30	315	XVE M150 B2 XVE M151 B2	60 80	
VEM 0200 V1 VEM 0201 V1 VEM 0202 V1	2"	401	327	200	10	750	XVE M300 B2 XVE M301 B2 XVE M302 B2	30 60 80	5,6
VEM 0250 V1 VEM 0251 V1 VEM 0252 V1	2-1/2"	401	327	200	10	810	XVE M300 B2 XVE M301 B2 XVE M302 B2	30 60 80	
VEM 0300 V1 VEM 0301 V1 VEM 0302 V1	3"	401	327	200	10	1050	XVE M300 B2 XVE M301 B2 XVE M302 B2	30 60 80	

## AUXILIARY WASHING EQUIPMENTS

### UBT ACCESSORIES

Head-carrying carts are the most convenient solution for fast washing of tanks raised from the ground with an opening in the bottom.

The base with wheels and the pantograph raising mechanism allow an easy positioning of the system at the base of the tank and a quick insertion of the washing head inside, with the aid of a manual crank handle.

The carts are designed to be equipped with a UBT series washing head, ideal for a complete medium pressure cleaning in every corner of the tank, thanks to the automatic bi-axial rotation mechanism.

**Materials**    **Structure**    **AISI 304L s.s.**  
**Wheels**         **PTFE**

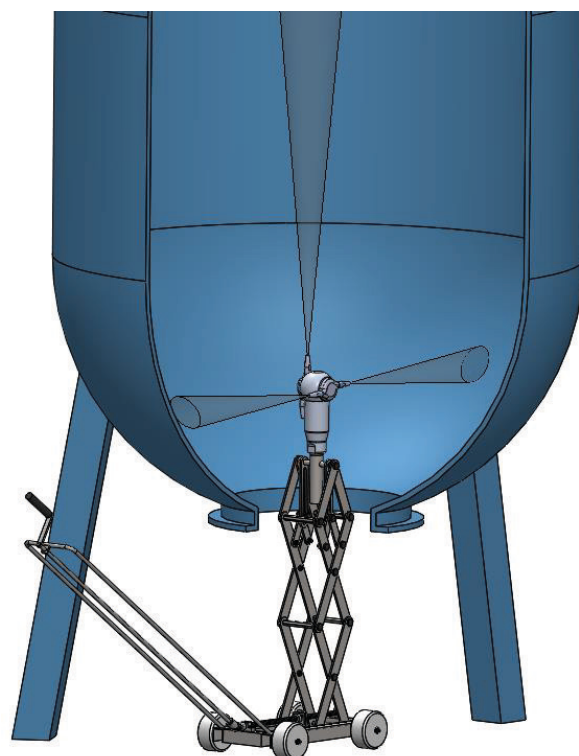
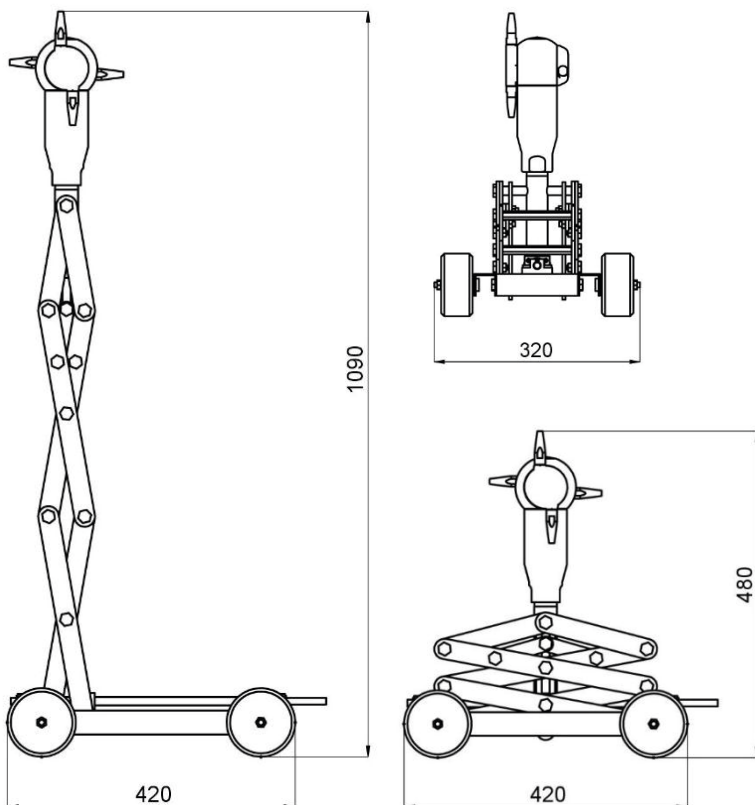
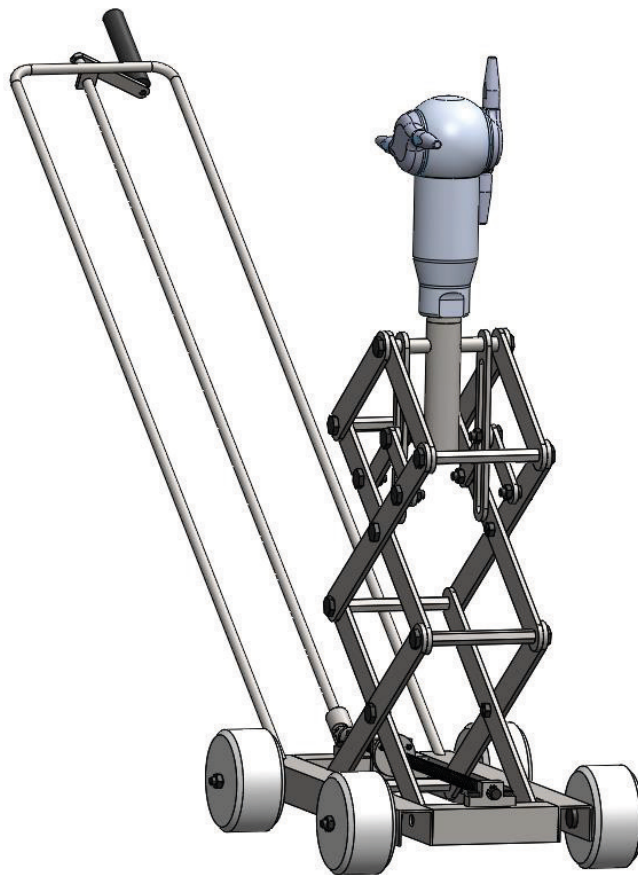
**Connection 1" BSPT (Male)**

**Advantages:**

- High portability
- Stability and resistance
- Easy to install and to use
- 360° cleaning of the tank

**Typical applications:**

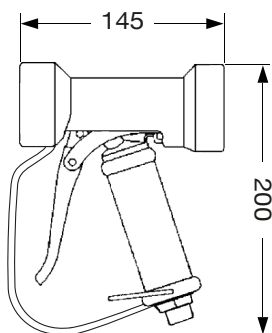
- Food and beverage industry
- Chemical and petrochemical industry
- Pharmaceutical industry
- Environmental industry



The dimensions are explanatory, please contact us for further information.

## AUXILIARY WASHING EQUIPMENTS

### HOT WATER GUN



UMV 2210 xx

The versatility of this washgun is enhanced from the additional model UMV 2211 xx, which can be fitted with nozzles or different lances through its 1/2" male thread. The three different lance models shown are easily fitted to the gun body with a 1/2" male nipple and offer the following choices of operation:

1 Foaming machines and equipment prior to washing operations. The foam lance comes with a quick connect female coupling, and a matching coupling must be fitted at the gun outlet.

2 General purpose 1/4" female thread outlet, 1/4" male thread inlet. Available both with heat protection sleeve, or zincplated steel. The general purpose lance needs a connection nipple 1/4" fem to 1/2" female to be fitted on the gun.

### UMV

The UMV series washgun has been designed primarily to avoid hot water waste, while assuring very comfortable operation conditions. Its thick rubber casing not only effectively protects the operator's hand from the discomfort of hot water but also assures an excellent protection in case the washgun is dropped or falls to the ground since it avoids any damage to the tiles or the equipment. The careful design, mainly used for the food industry, also includes a grease and detergent resistant quality rubber, plus a blue colour has been chosen as a visual aid to be seen clearly against a white or clear foreground. The trigger is lined too, and can be held in the open position by means of a lock-ring. The spray pattern can be adjusted continuously between a closed straight jet to a wide angle spray, so that the proper spray pattern can be chosen for each individual job.

#### Materials

<b>Body</b>	<b>T2 Brass casting, chrome plated</b>
	<b>B31 AISI 316L s.s.</b>
<b>Lining</b>	<b>E0 EPDM</b>
<b>Steam</b>	<b>B3 AISI 316 s.s.</b>
<b>Trigger</b>	<b>B3 AISI 316 s.s., rubber lined</b>

#### Performance

<b>Q</b>	<b>21 lpm @ 3 bar UMV 2210</b>
	<b>61 lpm @ 3 bar UMV 2211</b>

#### Technical data

<b>Hose shank</b>	<b>13 mm</b>
<b>Weight</b>	<b>0,9 kg</b>
<b>Max temperature</b>	<b>95° C</b>
<b>Max pressure</b>	<b>24 bar</b>

#### Complete guns code

UMV 2210 xx	Standard, adjustable jet
UMV 220A xx	With foam lance
UMV 220B xx	With 1/4" female outlet, bare lance
UMV 220C xx	With 1/4" female outlet, heat protected lance

#### Materials

UMV 2210, UMV 2211, UMV 220A, UMV 220B, UMV 220C  
**B31 AISI 316L s.s.**  
**T2 Chrome-plated brass**

#### XUM V005

**B31 AISI 316L s.s.**  
**T8 Nichel-plated brass**

#### Single components code

UMV 2211 xx	With 1/2" male quick thread, without lance
XUM V001 B2	Foam lance
XUM V002 B1	Quick connect coupling for foam lance, 1/2" F
XUM V003 B2	Universal lance, 1/4" F out, heat protection
XUM V004 B2	Universal lance, 1/4" F out, zinc-plated steel
XUM V005 xx	Nipple, 1/4" F x 1/2" F



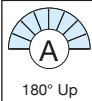
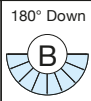

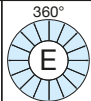
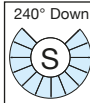
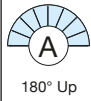
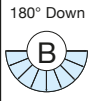
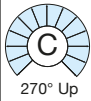
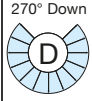
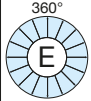
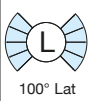
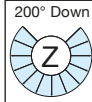
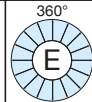
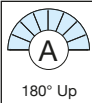
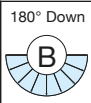
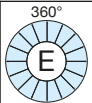
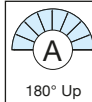
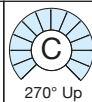
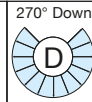
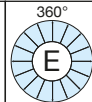
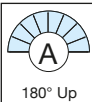
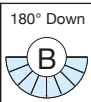
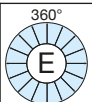
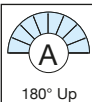
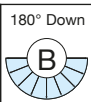
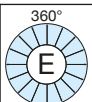
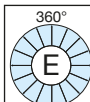
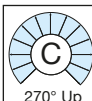
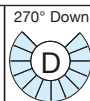
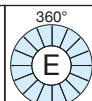
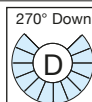
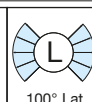
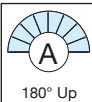
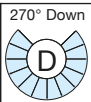
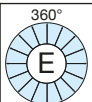
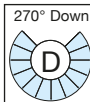
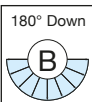
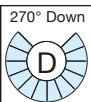
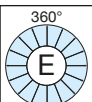
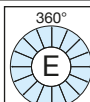
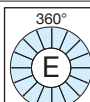
UMV 2211 xx + XUM V002 B1 + XUM V001 B2 = UMV 220A xx

+ XUM V005 xx + XUM V004 B2 = UMV 220B xx

+ XUM V005 xx + XUM V003 B2 = UMV 220C xx

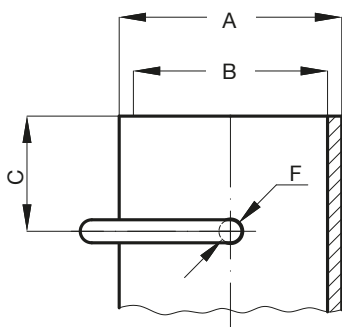


## TECHNICAL INFORMATION

Series	Type	Connection	Capacity (lpm)	Max WR (m)	Spray coverage
UA3	FIXED	clip-on	31,6 ÷ 183	3,5	   
UAB	FIXED	threaded (1/2")	18,0 ÷ 187	3,5	
UAC	FIXED	threaded (1/8" ÷ 1-1/4"), clip-on, welded	14,0 ÷ 1412	3,5	     
CH	FIXED Multi nozzles	threaded (3/4" ÷ 2")	8,26 ÷ 481	8,0	 
UBB	REACTION DRIVE Single axis	threaded (1/2" ÷ 3")	21,5 ÷ 1486	4,0	  
UBC	REACTION DRIVE Single axis	threaded (3/8" ÷ 1-1/4"), clip-on, welded	8,16 ÷ 458	3,2	   
UBD	REACTION DRIVE Single axis	threaded (1/4" ÷ 1-1/2")	29,0 ÷ 321	4,8	  
UBD A	REACTION DRIVE Single axis	threaded (1/4" ÷ 1-1/2")	28,6 ÷ 296	3,0	  
UBD S	REACTION DRIVE Single axis	threaded (3/8")	29,0 ÷ 88,0	3,0	
UBX	REACTION DRIVE Single axis	threaded (1/4" ÷ 3/4")	16,3 ÷ 99,0	3,5	  
UBF	REACTION DRIVE Single axis	threaded (1/2")	20,0 ÷ 76,0	1,5	 
UBF A	REACTION DRIVE Single axis	threaded (1/2")	20,0 ÷ 28,8	2,5	  
UBF S	REACTION DRIVE Single axis	threaded (1/8")	4,50 ÷ 6,40	0,8	
UBA	MOTOR DRIVE Single axis	threaded (3/4" or 1-1/2")	50,0 ÷ 273	5,0	  
UBE	MOTOR DRIVE Single axis	threaded (1/2")	12,9 ÷ 43,1	8,0	
UBT	TURBINE DRIVE Twin axis	threaded (1")	88,0 ÷ 162	11,0	

**TECHNICAL INFORMATION**

**CLIP CONNECTION SIZE**



	A	B	C	F
UBC $\phi$ 25 (UBC xxxx MMxC)	22,0	20,0	9,0	2,5
UBC $\phi$ 45 (UBC xxxx MMxC)	29,0	25,3	15,0	3,2
UBC $\phi$ 65 (UBC xxxx MMxD)	44,0	38,4	15,0	3,2
UBD xxxx MMxC	33,0	25,5	9,0	2,5
UBD xxxx MMxD	33,0	25,7	9,0	2,5

There is a number of different dimensions standards relating to clip-on connections on different markets, and between Europe and America. We have therefore identified with our Customers the most commonly requested types and have standardized as follows.

**UAC, fixed spray heads**

Drawings and sizes are available at pages 5 and 6: these will be the future sizes for every PNR device with clip-on connection, and they are based on DN (nominal diameter), as defined by European standards.

**UBC and UBD, reaction drive heads**

For the two above product types clip-on connections will maintain specifications used until present time. The diagram and the table showing the dimensions for the two product types and the different markets is shown below, and covers both European pipe dimensions (last letter of the code: C) and American (last letter of the code: D).

The variety of applications of stainless steel pipes/tubes, welded or seamless, generated several Regulations related to diameters, thicknesses, methods of production and finishing, surface quality, acceptance criteria. Recently, the authorities in charge tried to simplify such regulatory vastness with Standard DIN 11866 dated June 2016 which we report here below for what concerns the dimensional part. The norm is divided into three Ranges:

- Range A: pipe dimensions according to DIN EN 10357 extended by DN6 and DN8 (includes also previous standard DIN 11850);
- Range B: pipe dimensions according to DIN EN ISO 1127 (includes also previous standards DIN 2642 for seamless pipes and DIN 2643 for welded pipes);
- Range C: pipe dimensions according to ASME-BPE 2009.

**Note**

For the dimensioning of its tank washing heads, PNR adopts and uses DIN 11866:2016 as a reference standard, unless otherwise specifically requested by Customers. Standard DIN 11866:2016 does not include all previous Norms and measurement standards. Therefore, in this catalogue, it is possible to find references to dimensions of standards that are not included.

DIN 11866 Range A / 304L - 316L		
De (mm)	Thickness	DN
8,00	1,00	DN6
10,0	1,00	DN8
13,0	1,50	DN10
19,0	1,50	DN15
23,0	1,50	DN20
29,0	1,50	DN25
35,0	1,50	DN32
41,0	1,50	DN40
53,0	1,50	DN50
70,0	1,50	DN65
85,0	2,00	DN80

DIN 11866 Range B / 304L - 316L		
De (mm)	Thickness	DN
10,2	1,60	DN6
13,5	1,60	DN8
17,2	1,60	DN10
21,3	1,60	DN15
26,9	1,60	DN20
33,7	2,00	DN25
42,4	2,00	DN32
48,3	2,00	DN40
60,3	2,00	DN50
76,1	2,00	DN65
88,9	2,30	DN80

DIN 11866 Range C / 304L - 316L			
De (mm)	Thickness	DN	Ref.
6,35	0,89	DN8	1/4"
9,53	0,89	DN10	3/8"
12,7	1,65	DN15	1/2"
19,05	1,65	DN20	3/4"
25,4	1,65	DN25	1"
38,1	1,65	DN40	1-1/2"
50,8	1,65	DN50	2"
63,5	1,65	DN65	2-1/2"
76,2	1,65	DN80	3"

**ABBREVIATIONS**

<b>De</b>	EXTERNAL DIAMETER	mm	<b>L, L1</b>	WIDHT	mm	<b>RF</b>	CYLINDRICAL FEM BSP THREAD	inch
<b>Di</b>	INNER DIAMETER	mm	<b>LP</b>	MAX WORKING PRESSURE	bar	<b>RG</b>	CONICAL MALE BSPT THREAD	inch
<b>Dia</b>	ORIFICE DIAMETER	mm	<b>LT</b>	MAX WORKING TEMP.	°C	<b>W</b>	WEIGHT	kg
<b>DN</b>	NOMINAL DIAMETER	--	<b>Q</b>	CAPACITY	l/min	<b>WR</b>	WETTING RADIUS	m
<b>H, H1</b>	HEIGHT	mm						

## GENERAL INFORMATION

### PRODUCT WARRANTY

PNR products will be replaced or repaired at the option of PNR and free of charges if found defective in manufacturing, labelling and packaging. The above conditions will apply if notice of defects is received by PNR within 30 days from date of product installations or one year from date of shipment.

The cost of above said replacement or repair shall be the exclusive remedy for any breach of any warranty, and PNR shall not be held liable for any damage due to personal injuries or commercial losses coming from product malfunction. It is self-understood that no warranty may apply in case our products have been operated under nonacceptable conditions, like for example (but not limited to):

- Operation at pressures exceeding those shown in catalogue performance table
- Operation with or exposure to liquids containing abrasive particles
- Operation with or exposure to liquids producing a chemical attack on the nozzle material
- Mechanical damages to nozzle orifices, nozzle spray edge or body due to careless handling or assembling.

In all above cases, the customer must accept a nozzle life reduction below life expected, or performance parameters below the values in the catalogue. The guarantee may be exercised as follows:

- By sending a precautionary report to PNR on the detected damages. This report can also be sent by email to this address: [quality@pnr.it](mailto:quality@pnr.it)
- If PNR ascertains that the manufacturing faults are actually subject to the warranty, the product shall have be returned to the manufacturer in its original packaging prior request of authorization to the manufacturer and receipt of manufacturer's written authorization.
- The rejected goods shall have be returned by the means that PNR will communicate to the customer and the transportation costs of returned merchandise will be entirely borne by the manufacturer.

Our products are manufactured with the best care and according to the latest developments of the technology available. However we cannot assure that every one of our products is perfectly fit for every specific application. The information in this catalogue is provided "as seen" and so we offer no warranty of any kind with respect to the subject matter or accuracy of the information contained herein. This publication may include technical inaccuracies or typographical errors and changes may be periodically made to the information herein without prior notice.

### CERTIFICATIONS



PNR Italia srl is authorized to use the 3-A Symbol to the tank washing head code UA3 xxxx B31 xCx, conforming to 3-A Sanitary Standard 78-01 (Spray Cleaning Devices Intended to Remain In Place).



Single-axis rotary spray balls UBA, UBC, UBD, UBF, UBF-A, UBF-S are available in ATEX ("Atmosphères explosibles") version, in conformity with European Community Directive 2014/34/EU that determine compliance with the essential safety requirements for equipment and protection systems intended for use in potentially explosive atmospheres.

ATEX version is available, on request, for tank washing heads made of AISI 316L s.s. or Hastelloy C22.



Tank washing heads produced exclusively in AISI 316L s.s. and / or pure PTFE are available in MOCA version ("Materials and objects in contact with food"), in accordance with the Framework Regulation 1935/2004 and Regulation 2023/2006, which establish the criteria of traceability and processing of materials.

The MOCA version is available on customer's request for the washing heads produced in AISI 316L s.s., pure PTFE or with both materials.

# A GLOBAL PRESENCE ALL OVER THE WORLD.



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