SPRAY NOZZLES FOR INDUSTRIAL APPLICATIONS

INDUSTRIAL TANK WASHING SYSTEM

INTRODUCTION

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TECHNICAL PUBLICATIONS

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 to be always updated.

NOTES

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.

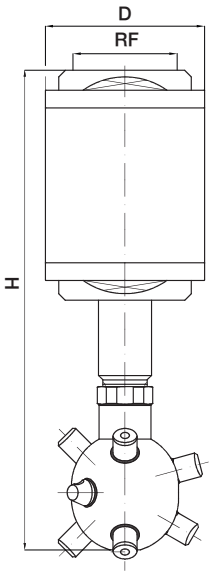
Twin axis heads
It's a device where the washing nozzles rotate around an horizontal axis, while the tankwasher body carrying the nozzles rotates at the same time around the vertical axis of the feed pipe. They allow stronger washing actions.

FDA approved
With this sentence, we confirm that the materials used for manufactoring 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.

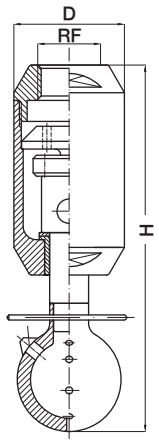
SINGLE AXIS HEADS

MOTOR DRIVE

UBA



UBA 3150 B31EG



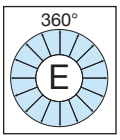
UBA 2500 B31xG

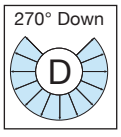
UBA series heads operate producing water jets out of a spray head rotating around a vertical axis, but feature a sophisticated design where the head is put in slow motion by a simple friction transmission.
As the motor produces a low rotation velocity, the jets can work with their maximum efficiency 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).

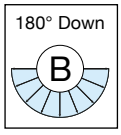
Materials	**Body, sphere**	**B31**	**AISI 316 s.s.**
		E1	**PTFE (only model 3150)**
	Bushings	**E1**	**PTFE**
	Motor ring	**E1**	**PTFE**

Size	RF BSP	Capacity at different pressures l/min bar				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.



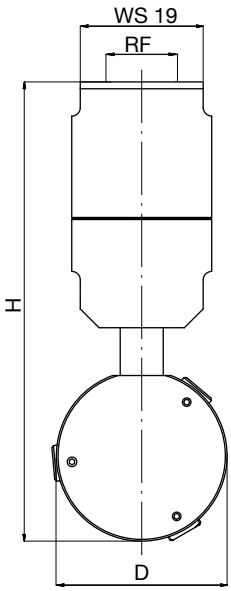




UBE

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.

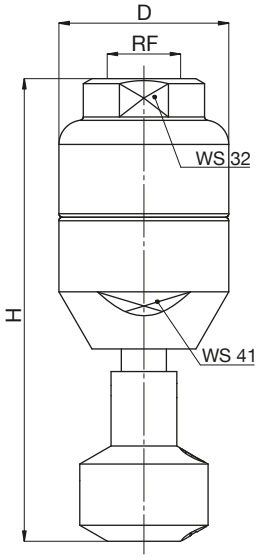


M018

Materials B31 AISI 316L s.s.
D81 PVDF

BSP thread connection

Code	RF BSP	Capacity at different pressures l/min bar					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

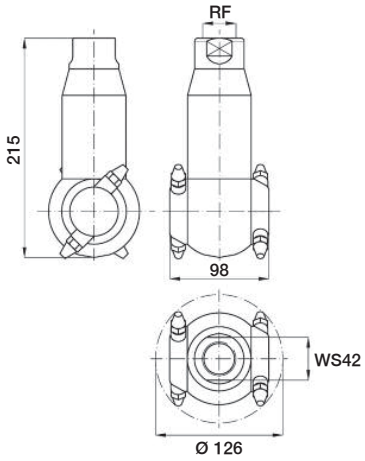
Sophisticated products offering modern design, excellent performance and high surface quality, mainly suitable for the chemical and pharmaceutical industry as they fully satisfy their demand for safe and reliable operation as well as perfect cleaning and sanitation.

UBT

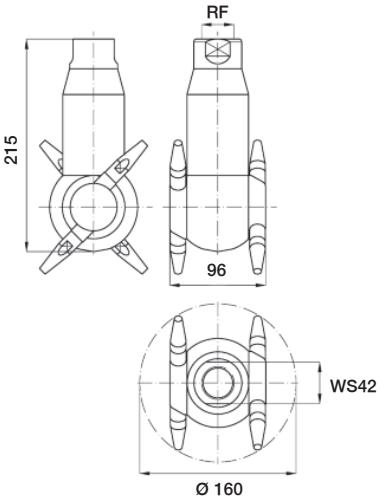
TURBINE DRIVE

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.



Model C: “short”



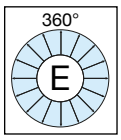
Model L: “long”

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).

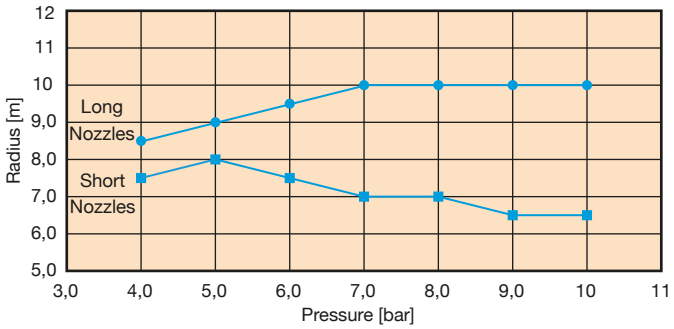


To order the required product, please note that:
a) second to last letter “C” indicates the Model C (short nozzle);
b) second to last letter “L” indicates the Model L (long nozzle).

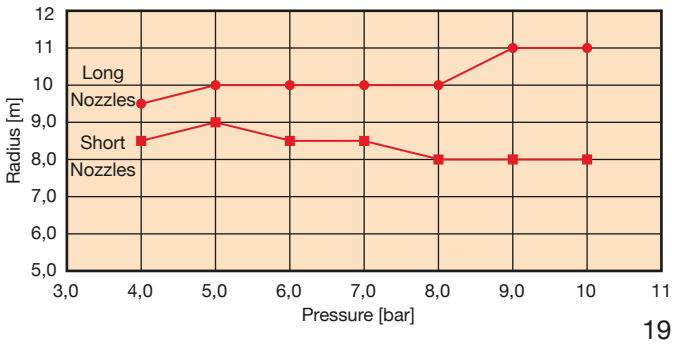
Ø is the nozzle diameter.

Code	Ø mm	RF BSPP	Capacity at different pressures l/min bar 4,0	5,0	6,0	7,0	8,0	9,0	10	Weight Kg
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



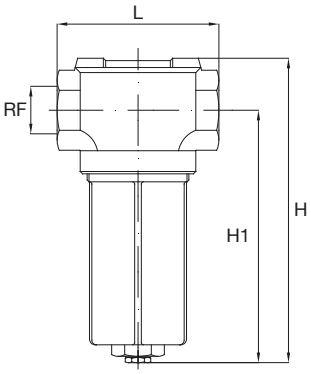
Wetting radius UBT S460



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

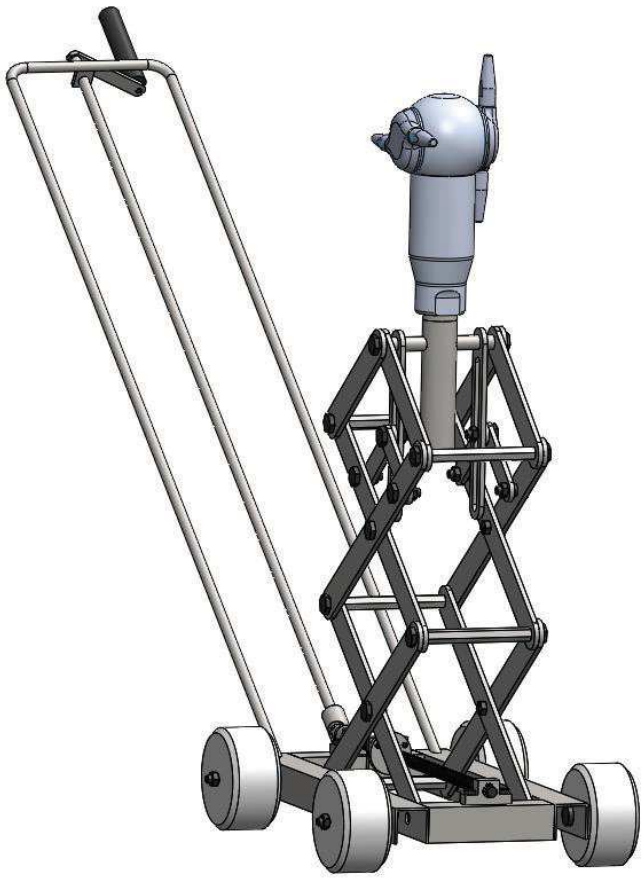
In the table, you find the code of the cartridges available for every filter.
The column “M” near the cartridge code show the value of filtration, in number of mesh.

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	1/2”	213	168	105	40	70	XVE M075 B2	60	
VEM 0051 V1							XVE M076 B2	80	
VEM 0075 V1	3/4”	213	168	105	40	95	XVE M075 B2	60	
VEM 0076 V1							XVE M076 B2	80	0,9
VEM 0100 V1							XVE M075 B2	60	
VEM 0101 V1	1”	213	168	105	40	140	XVE M076 B2	80	
VEM 0102 V1							XVE M077 B2	100	
VEM 0125 V1	1-1/4”	278	233	140	30	280	XVE M150 B2	60	
VEM 0126 V1							XVE M151 B2	80	1,6
VEM 0150 V1	1-1/2”	278	233	140	30	315	XVE M150 B2	60	
VEM 0151 V1							XVE M151 B2	80	
VEM 0200 V1							XVE M300 B2	30	
VEM 0201 V1	2”	401	327	200	10	750	XVE M301 B2	60	
VEM 0202 V1							XVE M302 B2	80	
VEM 0250 V1							XVE M300 B2	30	
VEM 0251 V1	2-1/2”	401	327	200	10	810	XVE M301 B2	60	5,6
VEM 0252 V1							XVE M302 B2	80	
VEM 0300 V1							XVE M300 B2	30	
VEM 0301 V1	3”	401	327	200	10	1050	XVE M301 B2	60	
VEM 0302 V1							XVE M302 B2	80	

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.

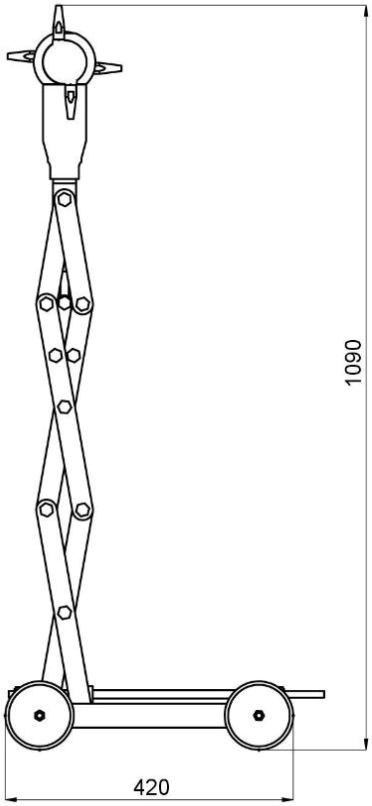


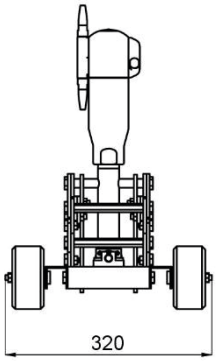
Materials **Structure** **AISI 304L s.s.**
Wheels **PTFE**

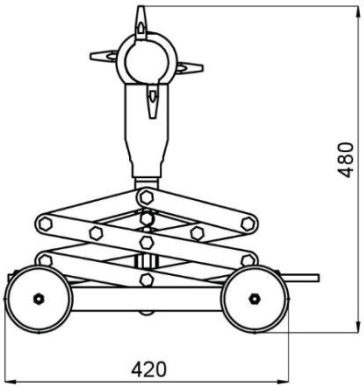
Connection 1” BSPT (Male)

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

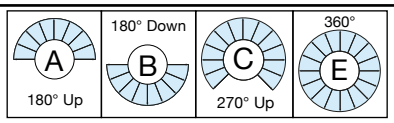
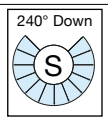
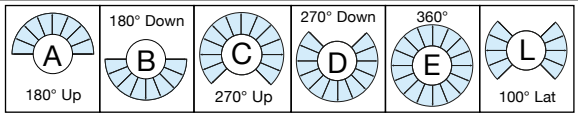
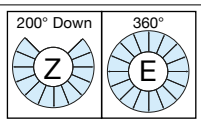
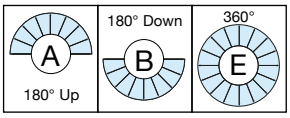
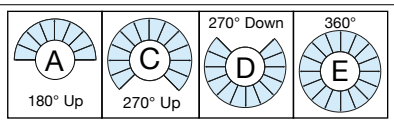
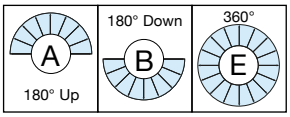
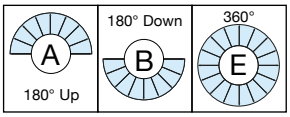
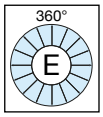
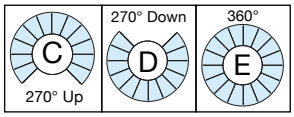
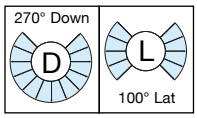
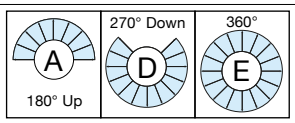
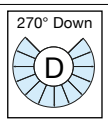
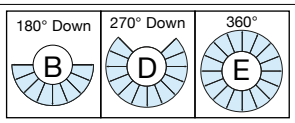
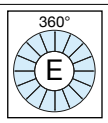
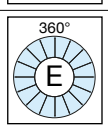






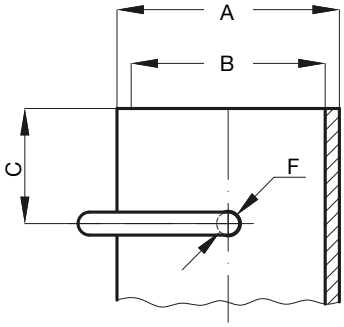
The dimensions are explanatory, please contact us for further information.

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 ϕ25 (UBC xxxx MMxC)	22,0	20,0	9,0	2,5
UBC ϕ45 (UBC xxxx MMxC)	29,0	25,3	15,0	3,2
UBC ϕ65 (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 standars.

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 an 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

De	EXTERNAL DIAMETER	mm
Di	INNER DIAMETER	mm
Dia	ORIFICE DIAMETER	mm
DN	NOMINAL DIAMETER	--
H, H1	HEIGHT	mm

L, L1	WIDHT	mm
LP	MAX WORKING PRESSURE	bar
LT	MAX WORKING TEMP.	°C
Q	CAPACITY	l/min

RF	CYLINDRICAL FEM BSP THREAD	inch
RG	CONICAL MALE BSPT THREAD	inch
W	WEIGHT	kg
WR	WETTING RADIUS	m

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 costumer 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
- 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

78-01

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).

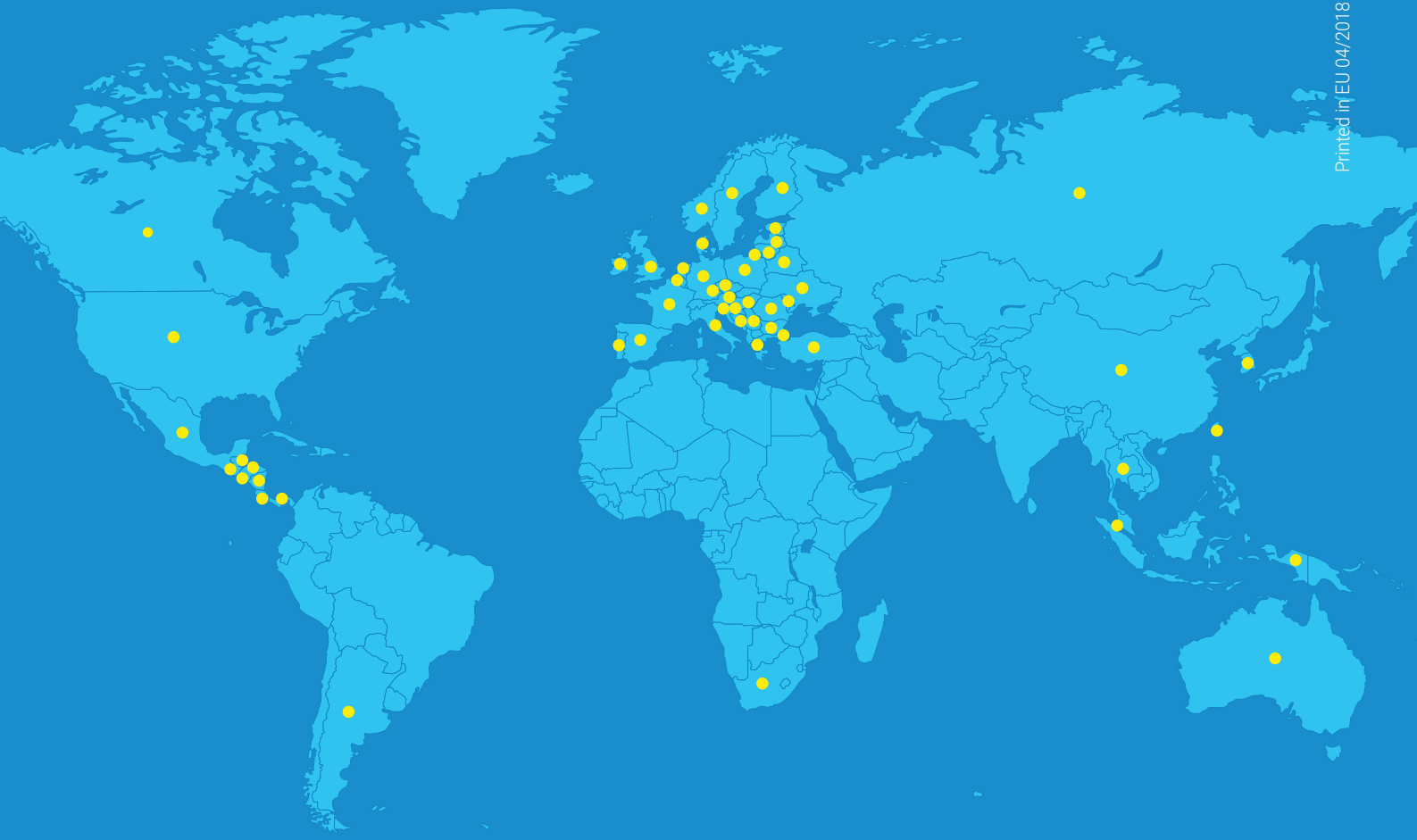
Single-axis rotary spray balls UBA, UBC, UBD, UBF, UBF-A, UBF-S are available in ATEX ("Atmosphères explosibles") version, in confomity with European Community Directive 2014/34/EU that determine compliance with the essential safety requirements for equipment and protection systems intended for use in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

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