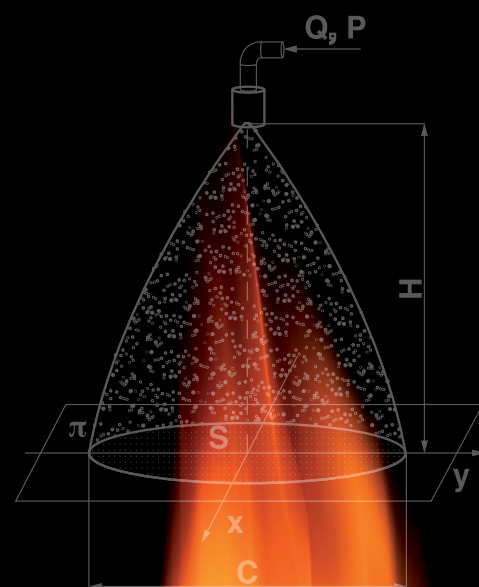




CTG FF12 BR



**FIRE FIGHTING  
PRODUCTS  
AND SYSTEMS**



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Our technical literature is continuously revised and updated and sent to our Customers who are listed in our Catalogues Delivery List.

#### WAIVER OF RESPONSABILITY

The information contained herein is provided "as is" and SDM does not guarantee the correctness and accuracy of the same. This publication may contain technical inaccuracies or typographical errors. It may also be subject to periodic changes without prior notice.



SDM is active in the field of fire fighting since 1975, having designed and installed hundreds of systems based on any possible extinguishing technology, be it gas, powder, water or foam. We offer today a complete range of products and systems designed and manufactured at the highest technical level, including nozzles and systems working on the modern concept of watermist extinguishing.

These systems, having been widely approved and tested in marine applications, will drive a deep change in the design of land based systems.

Our engineering staff, our modern computer systems and software, and our complete and efficient laboratories allow us to offer our customers designs of proven efficiency at a competitive cost, which shall be followed up from a professional service team at any time along their life.



In the following pages some technical information from our spray engineering handbook. This booklet can be obtained free of charge from any SDM company or SDM distributor.

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## Description

The **INTERNATIONAL SYSTEM OF UNITS** sometimes called SI, has been defined by the International Standards Organization (ISO) and is based upon metric units. The following notes include most units which are likely to be used in handling of fluids.

The system consists of nine base units, and supplementary units which are coherently derived from them. The consistency lies in the fact that the product, or the quotient of any two unit quantities in the system results in another unit quantity.

Because of the world wide trend to use this modern metric system, we are providing in the following the conversion constants for the most useful units.

### Base Units and derived units

The SI has defined the following base unit:

N°	QUANTITY UNIT	NAME UNIT	SYMBOL
1	Length	meter	m
2	Mass	kilogram	kg
3	Time	second	s
4	Thermodynamic temperature	Kelvin	K
5	Molecular substance	mole	mol
6	Electric current	Ampere	A
7	Light intensity	candela	cd
8	Plane angle	radian	rad
9	Solid angle	steradian	sr

Out of these base units many other have been derived, the most interesting for our purposes being listed below.

N°	QUANTITY UNIT	NAME UNIT	SYMBOL	EQUIVALENCES
10	Area	square meter	m <sup>2</sup>	
11	Volume	cubic meter	m <sup>3</sup>	
12	Density	kilogram per cubic meter	Kg/m <sup>3</sup>	
13	Velocity	meter per second	m/s	
14	Acceleration	meter per second squared	m/s <sup>2</sup>	
15	Angular velocity	radian per second	rad /s	
16	Frequency	Hertz	Hz	Hz = cycles / s
17	Force	Newton	N	N = kg · m/s <sup>2</sup>
18	Pressure	Pascal	Pa	Pa = N/m <sup>2</sup>
19	Momentum	kilogram meter per second	Kg m/s	
20	Energy	Joule	J	J = N · m
21	Power	Watt	W	W = J/s
22	Moment of force	Newton meter	N m	
23	Kinematic viscosity	square meter per second	m <sup>2</sup> /s	
24	Dynamic Viscosity	Pascal second	Pa s	
25	Thermal conductivity	Watt per meter Kelvin	W (m · K)	

### SDM material coding

SDM coding system has been organized so that the main characteristic of a single product can be understood from the product code.

Within product codes, construction materials are coded in the following way.

IRON ALLOYS	SUPERALLOYS	OTHERS	POLYMERS AND ELASTOMERS
A1: Carbon steel	H1: Titanium Gr 2 (3.7035)	F1: Tungsten carbide	D1: Polivinychloride PVC
A7: Chrome plated steel	L1: Monel 400	F2: Glass	D2: Polipropylen PP
A8: Zinc plated steel	L2: Incoloy 825 (2.4858)	F3: Ruby	D3: Nylon PA
A8: Nickel plated steel	L21: Alloy 600 (2.4816)	F5: Ceramic	D4: Plastic ABS
B1: AISI 303 (1.4305)	L22: Alloy 625	F6: Silicon carbide	D5: PP + powder TRPP
B2: AISI 304 (1.4301)	L23: Incoloy 800 (1.4958)	T1: Brass (2.0401)	D6: PP + glass fiber GFRPP
B3: AISI 316 (1.4401)	L3: Nicrofer 5923 (2.4605)	T3: Copper (2.0100)	D7: High density PE HDPE
B31: AISI 316L (1.4404)	L4: Stellite 6	T5: Bronze (2.1010)	D71: Poliethylen PE
B4: AISI 321 (1.4541)	L5: Hastelloy B2 (2.4617)	T8: Nickel plated brass	
B5: AISI 430F (1.4104)	L6: Hastelloy C4 (2.4610)	V1: AL 5076	
B8: AISI 309 (1.4828)	L61: Hast. C22 (2.4602)	V1: AL 6060	D8: Polyvinylidene fluoride PVDF
C1: AISI 420 (1.4034)	L62: Ultimet (2.4681)	V3: Zinc alloy	D9: Polyether ether ketone PEEK
C2: AISI 416 (1.4005)	L7: Alloy 201 (2.4061)	V5: Lead	E1: Teflon PTFE
C6: SAF 2205 (1.4462)	L71: Alloy 200 (2.4060)		E3: Plastic POM
C7: AISI 316Ti (1.4571)	L8: Hast. C276 (2.4819)		E6: Plexiglass PMMA
N1: AISI 302 (1.4320)	L9: Sanicro 28 (1.4563)		
N2: AISI 631 (1.4568)	L91: Alloy 31 (1.4562)		E7: Viton FPM
G1: Cast iron (1.1691)	N7: Inconel X750 (2.4669)		E8: Syntetic rubber NBR

### Conversion table: American units to Si units

QUANTITY	AMERICAN UNIT	CONVERSION FACTOR	SI UNIT
DENSITY	Pound mass/cubic feet	16.018	kilograms/cubic meter
FLOW RATE	Gallons per minute	3.785	liters per minute (lpm)
FLUID VOLUME	US Gallon	3.785	liter (l)
FORCE	Pound force	4.448	Newton (N)
HEAT	BTU (British Thermal Unit)	1055	Joule (J)
HEAT TRANSFER	BTU per hour	0.2931	Watt (W)
SPECIFIC HEAT CAPACITY	BTU per pound*deg F	4184	Joule / (kg K)
LENGHT	mil	25.4	Micrometer (micron)
LENGHT	Inches	25.4	millimeters (mm)
LENGHT	Foot	0.3048	meter (m)
POWER	Horsepower	0.746	kilowatt (kW)
PRESSURE	Pounds per square inch	0.0689	bar (1 bar = 100 kPa)
CALORIC VALUE ENTALPY	BTU per pound	2326	Joule per kg
SPECIFIC WEIGHT	Lbs per gallon	0.1198	kg per liter (kg/l)
SURFACE	Square inch	6,4516	square centimeter (cm <sup>2</sup> )
SURFACE	Square foot	0,0929	square meter (m <sup>2</sup> )
SURFACE	Acre	0,4047	hectares (ha)
VELOCITY	Foot per second	0.3048	meters per second (m/sec)
VELOCITY	Foot per minute	0.3048	meters per minute (m/min)
VELOCITY	Miles per hour	1.609	kilometers per hour (km/h)
VELOCITY	Knots	1.852	kilometers per hour (km/h)
VOLUME	Cubic foot	0.0283	cubic meter (m <sup>3</sup> )
VOLUME	Cubic inch	16.387	cubic centimeter (cm <sup>3</sup> )
WEIGHT	Pound	0.4536	kilogram (kg)
WEIGHT	Ton	0.90272	metric ton (t)

Multiply American Units on the left  
Divide SI Units on the right

(by the conversion factor)  
(by the conversion factor)

to obtain SI Units on the right.  
to obtain American Units on the left.

## TECHNICAL INFORMATION

### Conversion table: temperature scales



There are 4 principal types of temperature scales used to indicate the temperature: CENTIGRADE CELSIUS, FAHRENHEIT, KELVIN, and RANKINE; Kelvin and Celsius scales are used in Europe, Rankine, Fahrenheit are used in English speaking countries.

**MP** = water freezing point

**BP** = water boiling point

SYMBOL	NAME	MP	BP	NOTES
°C	Centigrade	0	100	0 and 100 are arbitrarily placed at the freezing point and boiling point of water.
°F	Fahrenheit	32	212	0°F is the stabilized temperature when equal amounts of ice, water, and salt are mixed. 96°F is the temperature "when the thermometer is held in the mouth or under the armpit of a living man in good health."
°K	Kelvin	273.16	373.16	Based upon the definitions of the Centigrade scale and the experimental evidence that absolute zero is -273,16° C and that is an international standard temperature point.
°R	Rankine	491.67	671.67	Based upon the definitions of the Fahrenheit scale and the experimental evidence that absolute zero is -273,16° C

CONVERSION FORMULAS TABLE				
	CELSIUS	FAHRENHEIT	KELVIN	RANKINE
°C=	-	$\frac{°F - 32}{1,8}$	K - 273,16	$\frac{R}{1,8} - 273,16$
°F=	1,8 °C + 32		1,8 K - 459,69	R - 459,69
K=	°C + 273,16	$\frac{°F - 32}{1,8} + 273,16$	-	$\frac{R}{1,8}$
°R=	1,8 (°C + 273,16)	°F + 459,67	1,8 K	-

°C	°F
-10	14
-8	17,6
-6	21,2
-4	24,8
-2	28,4
0	32
1	33,8
2	35,6
3	37,4
4	39,2
5	41
6	42,8
7	44,6
8	46,4
9	48,2
10	50
11	51,8
12	53,6
13	55,4
14	57,2
15	59
16	60,8
17	62,6
18	64,4

°C	°F
19	66,2
20	68
21	69,8
22	71,6
23	73,4
24	75,2
25	77
26	78,8
27	80,6
28	82,4
29	84,2
30	86
31	87,8
32	89,6
33	91,4
34	93,2
35	95
36	96,8
37	98,6
38	100,4
39	102,2
40	104
41	105,8
42	107,6

°C	°F
43	109,4
44	111,2
45	113
46	114,8
47	116,6
48	118,4
49	120,2
50	122
51	123,8
52	125,6
53	127,4
54	129,2
55	131
56	132,8
57	134,6
58	136,4
59	138,2
60	140
61	141,8
62	143,6
63	145,4
64	147,2
65	149
66	150,8

°C	°F
67	152,6
68	154,4
69	156,2
70	158
71	159,8
72	161,6
73	163,4
74	165,2
75	167
76	168,8
77	170,6
78	172,4
79	174,2
80	176
81	177,8
82	179,6
83	181,4
84	183,2
85	185
86	186,8
87	188,6
88	190,4
89	192,2
90	194

°C	°F
91	195,8
92	197,6
93	199,4
94	201,2
95	203
96	204,8
97	206,6
98	208,4
99	210,2
100	212
105	221
110	230
115	239
120	248
125	257
130	266
135	275
140	284
145	293
150	302
160	320
170	338
180	356
190	374

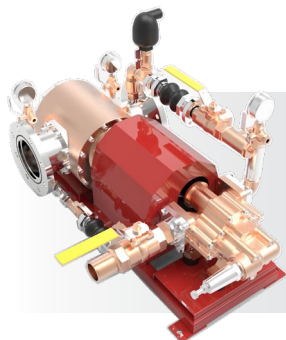
## TECHNICAL INFORMATION

## Metric and decimal equivalents of fractions of an inch



mm	FRACTIONS OF ONE INCH						INCHES
0,3969						1/64	0,015625
0,79375				1/32			0,03125
1,1906			1/16			3/64	0,04687
1,5875							0,0625
1,9844						5/64	0,078125
2,38125				3/32			0,09375
2,7781						7/64	0,109375
3,1750		1/8					0,125
3,5719						9/64	0,14062
3,96875				5/32			0,15625
4,3656						11/64	0,171875
4,7525			3/16			13/64	0,1875
5,1594							0,203125
5,55625				7/32			0,21875
5,9531						15/64	0,234375
6,3500		1/4					0,25
6,7469						17/64	0,265625
7,14375				9/32			0,28125
7,5406						19/64	0,29687
7,9375			5/16				0,3125
8,3344						21/64	0,328125
8,73125				11/32			0,34375
9,1281						23/64	0,359375
9,5250		3/8					0,375
9,9219						25/64	0,390625
10,31875				13/32			0,40625
10,7156						27/64	0,42187
11,1125			7/16				0,4375
11,5094						29/64	0,453125
11,90625				15/32			0,46875
12,3031						31/64	0,484375
12,7000	1/2						0,5
13,0969						33/64	0,515625
13,49375				17/32			0,53125
13,8906						35/64	0,54687
14,2875			9/16				0,5625
14,6844						37/64	0,578125
15,08125				19/32			0,59375
15,4781						39/64	0,609375
15,8750		5/8					0,625
16,2719						41/64	0,64062
16,66875				21/32			0,65625
17,0656						43/64	0,671875
17,4625			11/16				0,6875
17,8594						45/64	0,703125
18,25625				23/32			0,71875
18,6531						47/64	0,734375
19,0500		3/4					0,75
19,4469						49/64	0,765625
19,84375				25/32			0,78125
20,2406						51/64	0,796875
20,6375			13/16				0,8125
21,0344						53/64	0,828125
21,43125				27/32			0,84375
21,8280						55/64	0,85937
22,2250		7/8					0,875
22,6219						57/64	0,890625
23,01875				29/32			0,90625
23,4156						59/64	0,921875
23,8125			15/16				0,9375
24,2094						61/64	0,953125
24,60625				31/32			0,96875
25,0031						63/64	0,984375
25,4000							1,0





## POSITIVE DISPLACEMENT

PAGE 10



## BLADDER TANKS

PAGE 15



## BALANCED PRESSURE PROPORTIONER

PAGE 20



## WIDE RANGE PROPORTIONER

PAGE 23

The precise makeup of water and foaming agent to feed monitors and nozzles in fire fighting systems is of fundamental importance for the efficient performance of the same.

In the past this process has been performed mainly through system based onto the Venturi effect, which allows for simplicity of construction and an acceptable performance, and used both in mobile and fixed systems like bladder tanks and automatic balanced pressure mixing systems.

When used in fixed systems the typical problems of the Venturi concept (sensitivity to pressure drops between mixer and monitors/nozzles) have often added up to problems connected to the system design.

As an example balanced pressure system require the foam agent to be supplied under pressure and therefore an electric line for a pump, while bladder tanks have forcibly a limit to the quantity of foam agent available this being a huge problem for those systems supposed or required from the circumstances to remain operative for extended time periods.

In recent years a more sophisticated concept has been developed, allowing for the make up of foam mix with precise and constant percentage, while assuring the possibility to feed foam agent for indefinite periods of time, actually dependent only from the quantity of foam agent available.

These systems are based upon the use of volumetric pumps, that is pumps which push forward a precise quantity of liquid for each shaft revolution, and use a specific characteristics of those pump which are reversible machines this meaning they can be put in operation from a motor pumping liquid, or the can be made to turn from a liquid flowing through them and work as a motor using part of the energy of the liquid flowing through to supply mechanical energy and put another pump in operation.

It is then possible to use two volumetric pumps, whose capacity has the same percentage mix required, and use the larger one as a motor while being flown through from the water directed to the monitors to puth the smaller one in operation to pickup foam agent from a tank and inject the right percentage inside the output pipe of the first : this process does not require any other energy.

The concept was first applied on large machines consisting of two screw pumps, delivering large flows of foam mix in oil refineries and oil stock plants, with totally satisfactory performances and excellent serve life.

These machines, our URW models have noticable capacities and dimensions and require careful servicing from well trained personnel, which is possible in large dimension plants.

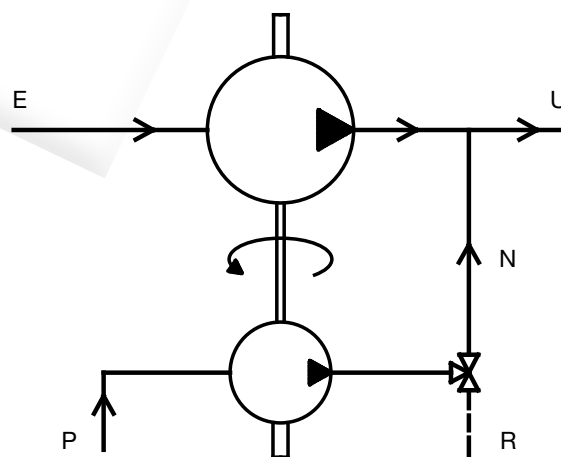
One of the best advantages of these machines is that, by the concept itself, they assure a precise mixing percentage over an extended range of capacities and this fits very well the requirements of smaller systems for general purpose applications.

This has led to the design of smaller size machines, always consisting of two cpupled volumetric pumps albeit of simpler design ans smaller dimensions.

In these machines the motive pump is generally a rotary blade pump, while the foam agent pump maybe a gear or a piston pump the latter allowing a variable percentage mix when possible to exclude one or more of the plungers.

The operating principle is very simple and shown in the diagram below:

- E Main water inlet
- U main foam outlet
- P Foam agent pickup
- N Foam agent injection into main water line
- R Foam agent bypass for machine testing



SDM employs experienced engineers in this sector, and offers a unique product range covering all application range, for both large machines based onto screw pumps and smaller machines working out of a rotary blade pump, as shown in the following pages.

### URY

Foam mixers built on the principle of a double volumetric pump was first introduced on large üplants like oil refineries or stocking fields, but was afterwards applied to different fields and on smaller plants thanks to the simplicity of use and dependable performances.

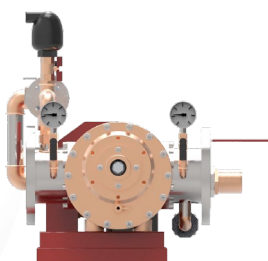
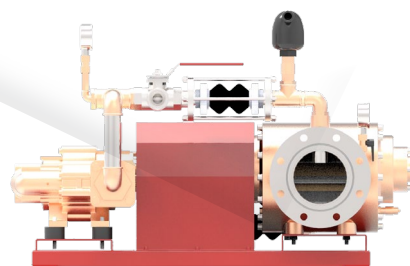
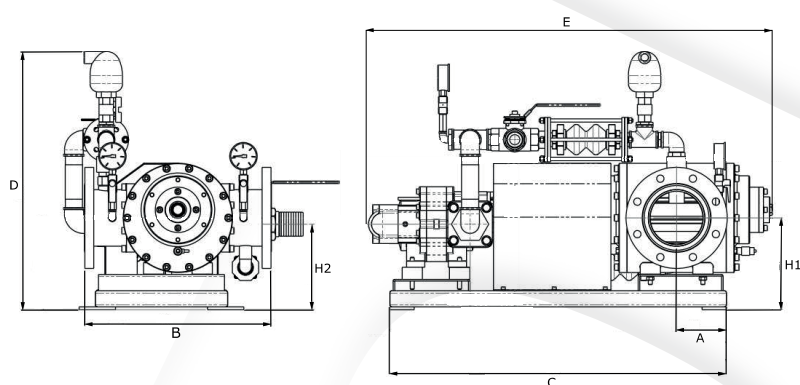
SDM manufactures a range of hese smaller mixers, with the URY series, whose performances are shown in the table below.

These machines are available with two different layouts, offering different performances for the foam agent pickup pump:

- Standard system, using a fixed capacity gear pump, with capacity range 1:5
- Optional system, with a variable capacity piston pump, with capacity range 1:10

URY mixers, tanks to their limited dimensions and weight can easily be assembled onto a trailer and coupled to a foam agent tank for local use in emergency on large dimensions plants.

URY mixers are delivered complete with three-way valve for foam agent reciclyng when the system is tested and pressure reading manometers at inlet and outlet of main water line.



### Materials

Rotary vane pump

Body and rotor

Bronze

Blades

Nylon

Other parts

AISI 316 stainless steel

All parts

Cast iron

Gear pump

Piping, all bolts

Stainless steel AISI 316

Frame

All parts

Epoxy painted carbon ateel

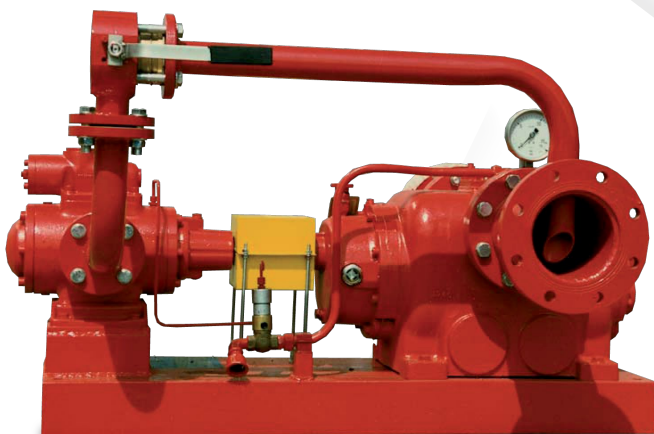
Code	Capacity <i>Lpm</i>	Suction and discharge flange water			Foam inlet size	Dimensions (mm)						
		DN	PN	150		A	B	C	D	E	H1	H2
URY A025 T5 XY	500 - 2500	100	16	4"	1 ½"	123	460	830	640	987	227	212
URY B025 T5 XY	250 - 2500	100	16	4"	1 ½"	123	460	830	640	987	227	212
URY A040 T5 XY	800 - 4000	125	16	5"	1 ½"	123	460	830	640	987	227	212
URY B040 T5 XY	400 - 4000	125	16	5"	1 ½"	123	460	830	640	987	227	212
URY A060 T5 XY	1200 - 6000	150	16	6"	2"							
URY B060 T5 XY	600 - 6000	150	16	6"	2"							
URY A080 T5 XY	1600 - 8000	200	16	8"	2 ½"							
URY B080 T5 XY	800 - 8000	200	16	8"	2 ½"							
URY A100 T5 XY	2000 - 10000	250	16	10"	3"							
URY B100 T5 XY	1000 - 10000	250	16	10"	3"							
URY A120 T5 XY	2500 - 12000	300	16	12"	4"							
URY B120 T5 XY	1200 - 12000	300	16	12"	4"							

### SDM order code:

Ex.: URY A025 T5 XY

A = Pump type	X = Flange type	Y = Mixing %
A = Gear pump	A = ANSI	3 = 3%
B = Plunger pump	B = UNI	6 = 6%





This is the most modern and precise type of proportioning equipment for large stationary systems, where it is required to maintain a stock of foaming agent available.

These machines have been developed to overcome limitations and disadvantages coming from the operation of bladder tanks, that is the following:

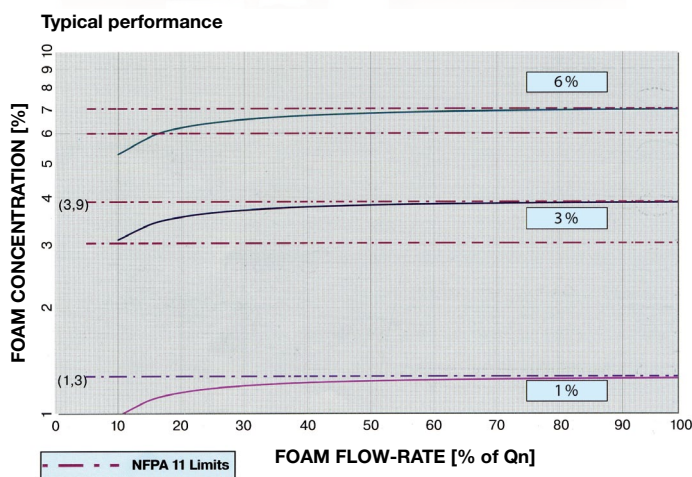
- Limited operation time, once used the foaming agent in the bladder tank the tank needs refilling
- Limited range of precise proportioning, typically lower than 1:5 in capacity range
- Costly and complicated maintenance, especially if tank placed inside a building

The machine concept is very simple, consisting in two volumetric (screw) pumps, the bigger one working as a motor makes use of the main water line pressure to rotate the smaller one, which injects the foaming agent under pressure into the main water line.

With this design the machine is self-powered and does not need any kind of additional energy.

A three way valve allows for the foam agent being injected in the main water line or alternatively being sent back to the foam agent tank when testing the system.

The mechanical (elastic) coupling between the two machines, which pump a precise liquid volume at each turn, assures a constant and precise proportioning for any given capacity value, in an operating range well over 1:10, which is unparalleled in the whole world market.



The sturdiness of the system and the very strong design of screw pumps assure the highest reliability year over year, even when the system is tested in operation every month.

In addition these machines assure the following advantages:

- System can work for unlimited time, foaming agent being supplied from any atmospheric pressure container, like trucks or even 200 litre barrels
- System works fine even at very little load, e.g. using one only monitor out of a group
- In a large plant one only foam agent stock can be built in a central location serving all systems
- Workers can supply foam agent away from the fire area, with lower risks
- The system is compliant with NFPA 11
- The machine can work with sea water

### Materials

The materials used are resistant to the most common foam agents and allow the machine to be flushed with sweet water after testing.

### Drive motor

Body

Idle rotor

Drive rotor

Epoxy coated cast iron / Full bronze on small sizes

Bronze

Cr Stainless steel

### Injection pump

Body

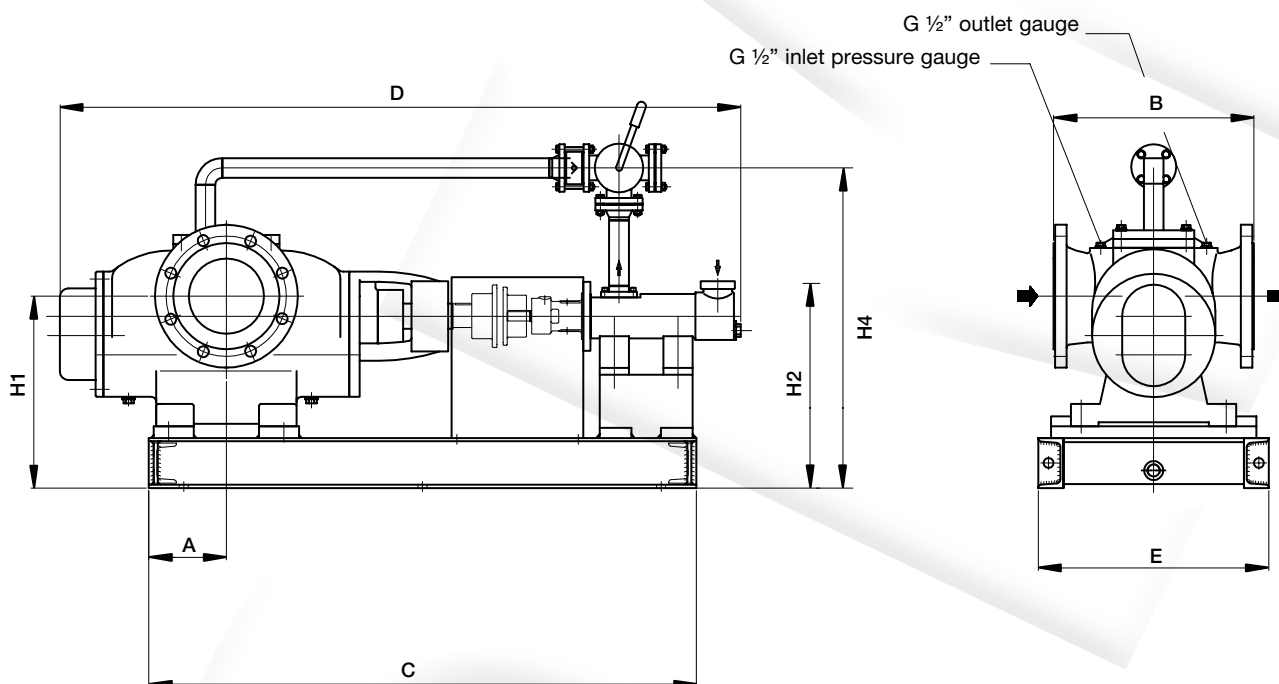
Rotors

Cast iron GG25 with internal Teflon / Graphite coating

Cr Stainless steel



Data for information purpose only  
Not valid for construction



Code	Pump Size *	Pump Dimensions								Suction and Discharge Flange Water			Suction Flange Foamer	
		A	B	C	D	E	H1	H2	H4	DN	PN	150	RS	DN
URW 1203 G4SE	120.3	370	320	892	1115	170	316	358	574	100	16	4"	SAE 1 1/4"	32
URW 1206 G4SE	120.6	370	320	925	1155	170	316	358	574	100	16	4"	SAE 1 1/4"	32
URW 1503 G4SE	150.3	420	370	994	1249	195	371	403	615	125	16	5"	SAE 1 1/4"	32
URW 1506 G4SE	150.6	420	370	1071	1310	195	371	403	615	125	16	5"	SAE 1 1/2"	40
URW 2403 G4SE	240.3	420	400	1079	1350	215	383	423	615	150	16	6"	SAE 1 1/4"	32
URW 2406 G4SE	240.6	420	400	1215	1476	215	383	433	615	150	16	6"	SAE 2"	50
URW 3003 G4SE	300.3	460	440	1222	1449	230	423	443	700	150	16	6"	SAE 1 1/2"	40
URW 3006 G4SE	300.6	460	440	1281	1564	230	423	453	700	150	16	6"	SAE 2"	50
URW 3603 G4SE	360.3	460	460	1311	1604	250	423	468	820	200	16	8"	SAE 2"	50
URW 3606 G4SE	360.6	460	460	1330	1674	250	423	478	820	200	16	8"	SAE 2 1/2"	65
URW 4503 G4SE	450.3	500	480	1401	1720	265	458	503	820	200	16	8"	SAE 2"	50
URW 4506 G4SE	450.6	500	480	1420	1790	265	458	513	820	200	16	8"	SAE 2 1/2"	65
URW 6003 G4SE	600.3	550	520	1484	1887	280	483	553	850	250	16	10"	SAE 2 1/2"	65
URW 6006 G4SE	600.6	550	520	1556	1955	280	483	563	850	250	16	10"	SAE 3"	80
URW 7503 G4SE	750.3	550	550	1500	1914	280	478	568	850	300	16	12"	SAE 2 1/2"	65
URW 7506 G4SE	750.6	550	550	1662	2067	280	478	593	850	300	16	12"	SAE 4"	100
URW 9003 G4SE	900.3	680	740	1657	2104	320	633	688	880	300	16	12"	SAE 2 1/2"	65
URW 9006 G4SE	900.6	680	740	1819	2257	320	633	703	880	300	16	12"	SAE 4"	100

**\* Pump size**

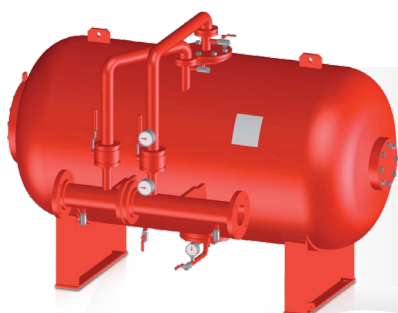
The pump size figure shows both the maximum capacity and the mix percentage, eg:

120.3 = maximum capacity 120 cubic metres per hour (minimum capacity 12 cubic metres per hour) and mix percentage 3%



VERTICAL

PAGE 17



HORIZONTAL

PAGE 19



INDEPENDENT MIXING UNIT

PAGE 22



WALL-MOUNT BOX

PAGE 24

Bladder tanks work without requiring external energy for a foam agent pump since the foam agent, contained into a rubber bladder inside the tank, is put under pressure letting water under pressure from the main line enter the tank and surround the bladder.

A bladder tank can feed several different foam producing devices, all at the same time or just a single one, with a range in water capacity 1:6.

SDM offers a very complete range of bladder tanks, built in thousands of units and fully tested in hundreds of sites.

Our long experience in the construction of professional fire fighting equipment allows us to offer the highest quality on the market today, and what most matters, a reliable solution to all of your design problems.

**Basic features****Construction code**

CEE 97/23  
PED EN 13445-3  
ED 2002 issue 32

**Construction materials**

Tanks	P355NH EN 10028-3 / ASTM A 516 Gr 70
Pipes	ASTM A 106 Gr. B
Flanges	ASTM A 105
Cut-off ball valves	Carbon steel body, AISI 316 balls
Other valves	Nickel plated brass
Pressure gauges	Stainless steel body
Safety valve	Brass
Bladder	Hypalon / Neoprene
Coating	Epoxy paint, RAL 3000
Packing	On wooden pallet

**Quality features**

In addition to the high quality of all the materials used to build our tanks we also supply them with our specially made bladder, which has the collar for tank connection cast in one piece, so as to be able to hold internal pressure for long time without any fluid loss.

**On request specifications**

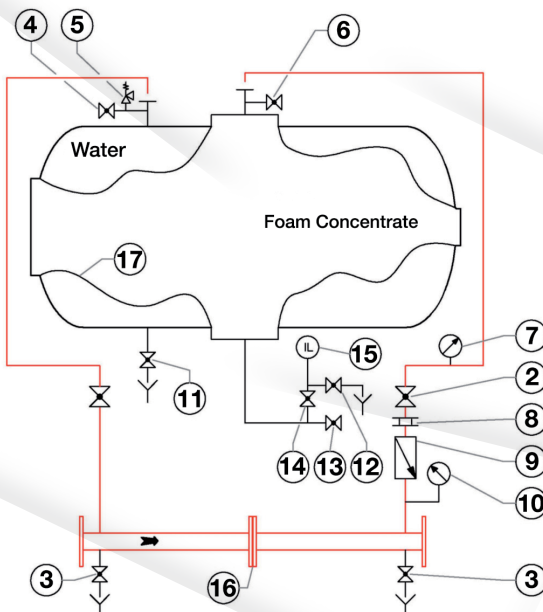
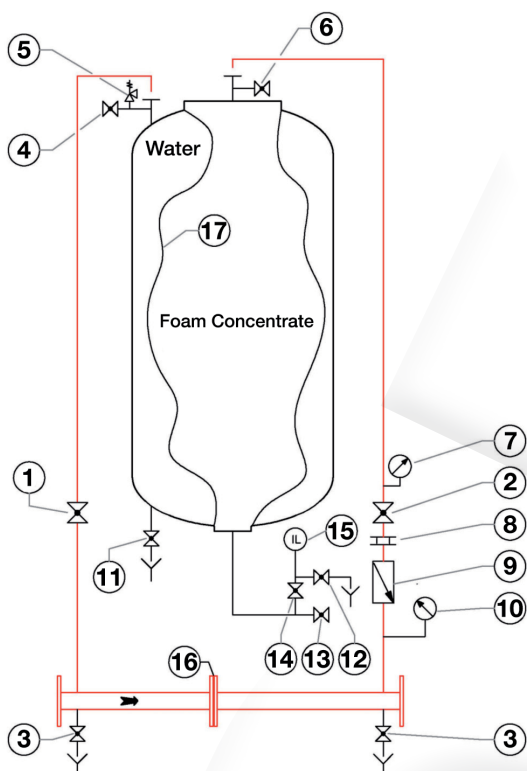
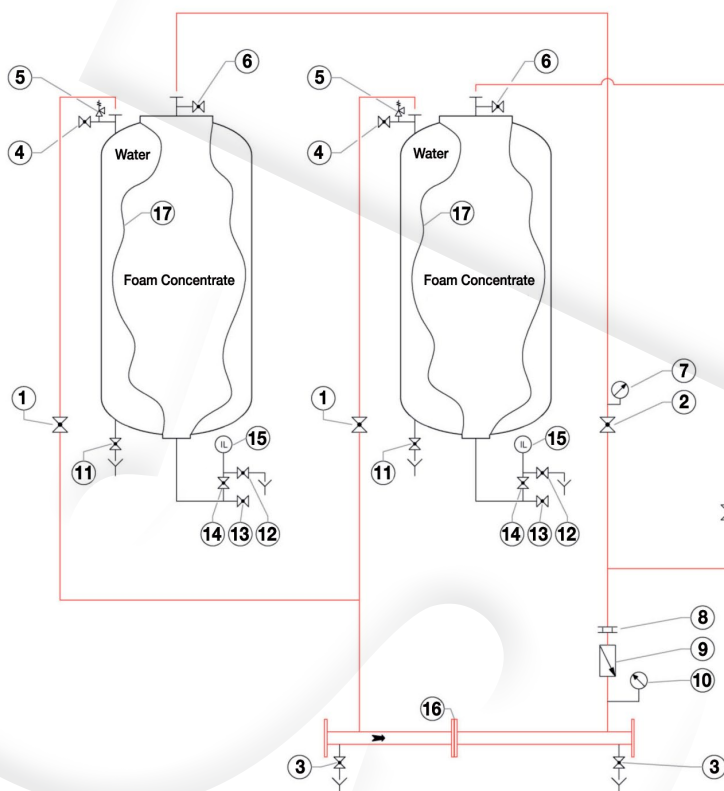
Construction according to ASME codes.  
Construction on customer specified pressure.  
Welding check through dye penetration or X-ray.  
Performance test on factory proving ground and manufacturer certificate.

**Documents delivered with our tanks**

Warranty certificate.  
Hydraulic pressure test certificate.  
Operation and service manual, including filling instructions (available in Italian, English, French).

**Documents available at our Offices**

All documents relating to products built according to the PED norms are available to any authorities at our Offices.

**FOAM MIXERS****Bladder tank functional scheme****Single bladder tank****Twin bladder tank**

- |     |                                            |
|-----|--------------------------------------------|
| 1.  | Stop valve                                 |
| 2.  | Concentrate stop valve                     |
| 3.  | Drain valve, mixer                         |
| 4.  | Water vent valve                           |
| 5.  | Safety valve                               |
| 6.  | Vent valve                                 |
| 7.  | Pressure gauge                             |
| 8.  | Foam diaphragm                             |
| 9.  | Check valve                                |
| 10. | Pressure gauge, differential               |
| 11. | Drain valve, water                         |
| 12. | Drain valve, level gauge                   |
| 13. | Drain valve, concentrate (& filling valve) |
| 14. | Cut-off valve, level gauge                 |
| 15. | Level gauge                                |
| 16. | Water diaphragm                            |
| 17. | Bladder                                    |

We can design and quote any size of twin bladder tanks according to customer specification.  
 Please ask our Offices or Distributors

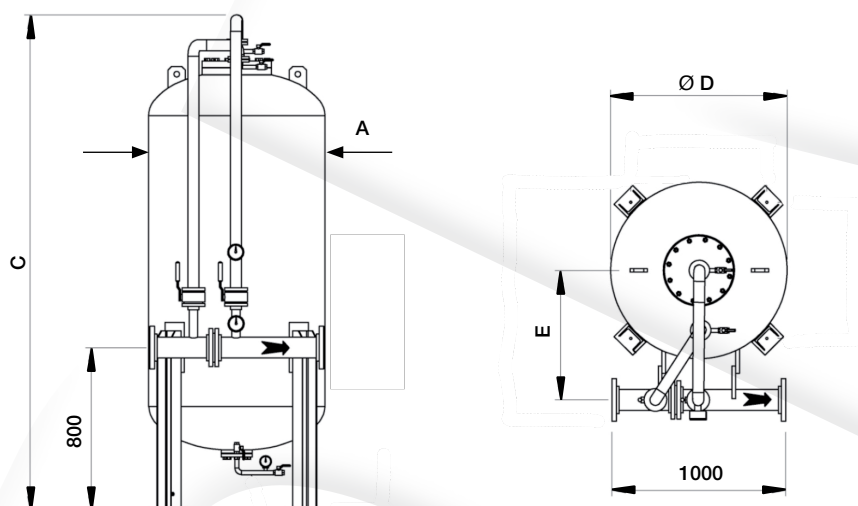


Tanks shown in this page are fitted with a foam mixer, therefore the weight value shown include the weight for the mixer and the related piping.

See the materials specifications at page 15.

Detailed dimensions for the tank and fixing instructions on the ground are available at our offices.

### Vertical with foam mixer

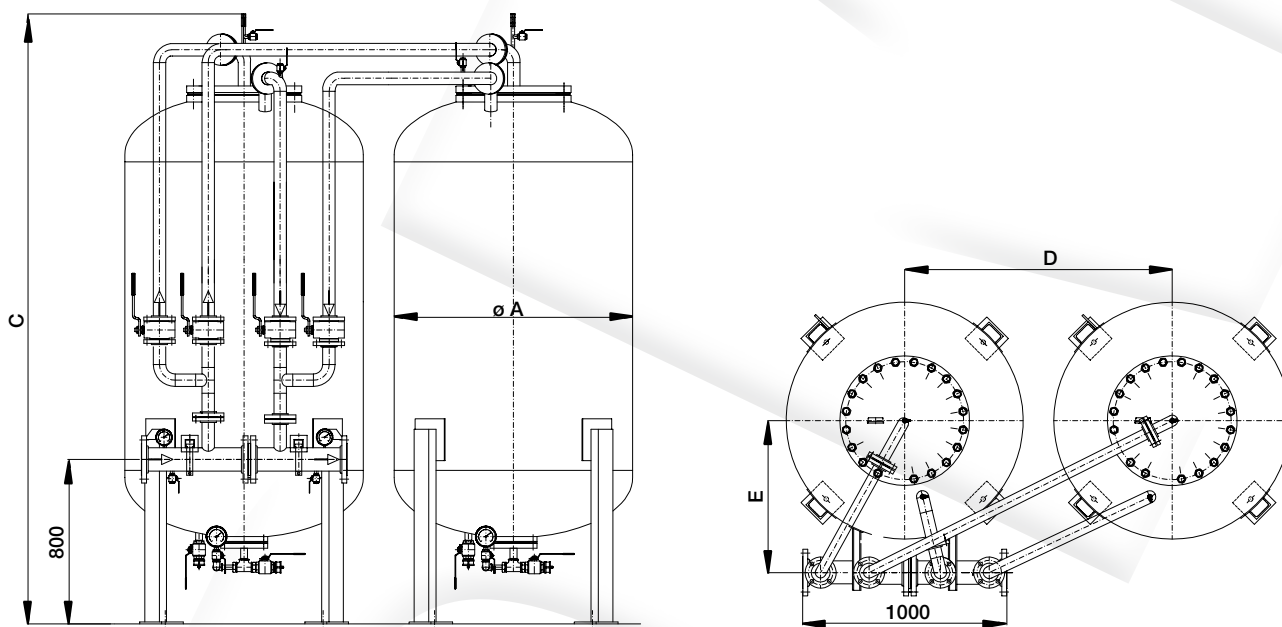


Code	A mm	C mm	E mm	Weight full kg	Capacity litres
URT A004 A2	650	2030	440	700	400
URT A006 A2	750	2176	650	1170	600
URT A010 A2	900	2246	750	1730	1000
URT A015 A2	1000	2926	750	2430	1500
URT A020 A2	1050	3300	800	3360	2000
URT A025 A2	1200	3800	800	4030	2500
URT A030 A2	1290	3430	860	4700	3000
URT A035 A2	1400	3930	900	5580	3500
URT A040 A2	1500	3530	950	6300	4000
URT A050 A2	1600	3606	1050	7660	5000
URT A060 A2	1800	3680	1150	9030	6000
URT A080 A2	2000	4008	1200	11700	8000

### Wide range capacity model

These tanks can be equipped with the Wide Range proportioner shown at page 23 to extend their operation range. Such models are identified adding a W at the end of the product code.

EG Standard type URT A080 A2 has a code URT A080 A2W when equipped with above said proportioner.

**Vertical, twin, with foam mixer**

Code	A mm	C mm	D mm	E mm	Working weight kg	Capacity litres
URT D004 A2	650	2176	1000	650	2350	2x 600
URT D006 A2	750	2246	1200	750	3470	2x 1000
URT D010 A2	900	2926	1200	750	4870	2x 1500
URT D015 A2	1000	3300	1300	800	6730	2x 2000
URT D020 A2	1050	3800	1340	800	8070	2x 2500
URT D025A2	1200	3430	1440	860	9410	2x 3000
URT D030 A2	1250	3930	1540	900	11170	2x 3500
URT D035 A2	1400	3530	1650	950	12610	2x 4000
URT D040 A2	1500	3606	1800	1050	15330	2x 5000
URT D050 A2	1600	3680	1950	1150	18070	2x 6000
URT D060 A2	1800	4008	2160	1200	23410	2x 8000

**Wide range capacity model**

These tanks can be equipped with the Wide Range proportioner shown at page 23 to extend their operation range. Such models are identified adding a W at the end of the product code.

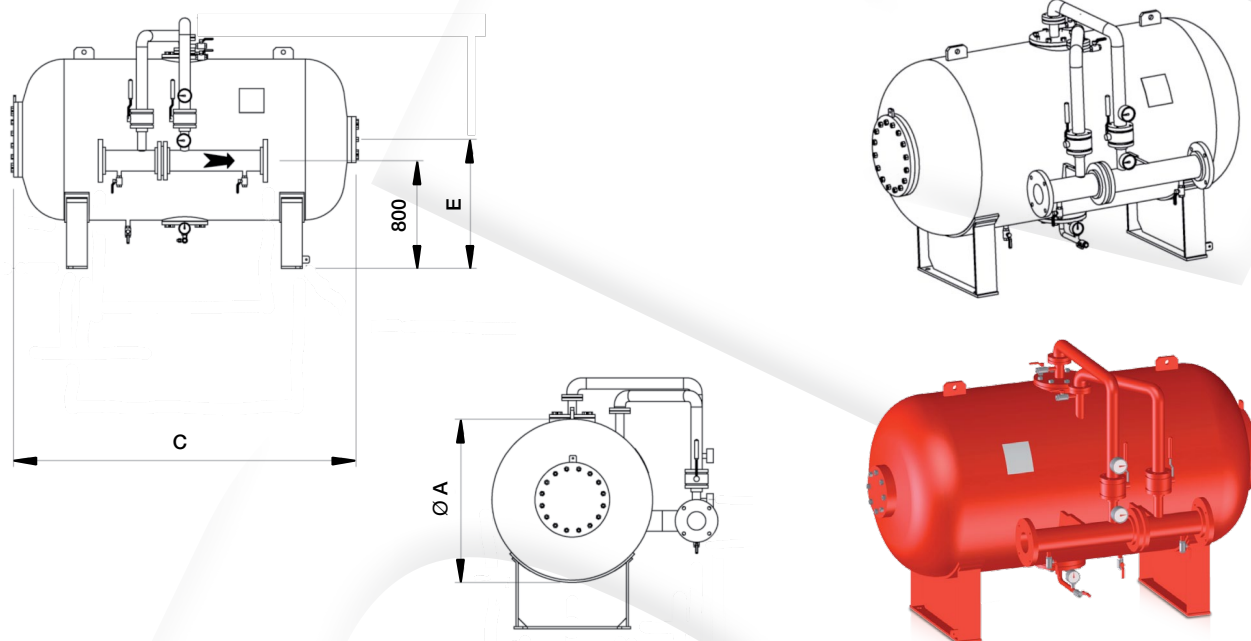
EG Standard type URT D060 A2 has a code URT D060 A2W when equipped with above said proportioner.

Tanks shown in this page are fitted with a foam mixer, therefore the weight value shown include the weight for the mixer and the related piping.

See the materials specifications at page 15.

Detailed dimensions for the tank and fixing instructions on the ground are available at our offices.

### Horizontal, with foam mixer



Code	A mm	C mm	E mm	Weight full kg	Capacity litres
URT C010 A2	900	1746	1000	1730	1000
URT C015 A2	1000	2426	1000	2430	1500
URT C020 A2	1050	2800	1035	3360	2000
URT C025 A2	1200	3100	1035	4030	2500
URT C030 A2	1250	2730	1125	4700	3000
URT C035 A2	1400	2320	1125	5580	3500
URT C040 A2	1500	3030	1225	6300	4000
URT C050 A2	1600	3106	1300	7660	5000
URT C060 A2	1800	3181	1375	9030	6000
URT C080 A2	2000	3308	1450	11700	8000
URT C100 A2	2000	3890	1450	13500	10000

### Wide range capacity model

These tanks can be equipped with the Wide Range proportioner shown at page 23 to extend their operation range. Such models are identified adding a W at the end of the product code.

EG Standard type URT C080 A2 has a code URT C080 A2W when equipped with above said proportioner.

## FOAM MIXERS

**Balanced pressure proportioner**

This mixer works balancing the pressure from water and foaming agent in order to assure a correct mixing ratio for different water pressure values, the device adjusts instantly the mixing ratio since the two pressure values are picked up from the water line and the foaming agent line and transferred into a balancing diaphragm at the top of the device.

Therefore the stem of the inside regulation valve positions itself to assure the correct quantity of foaming agent to be injected into the water line, which happens in the low pressure area of the Venturi mixer contained in the lower part.

A calibrated diaphragm at the inlet of the lower body defines the nominal mix percentage.

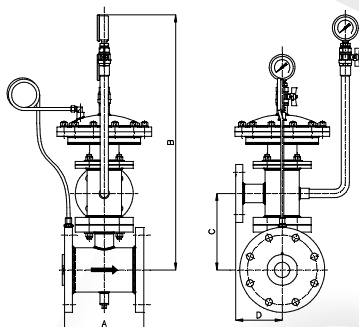
It is required for a correct operation the foaming agent pressure to be about 2 bar higher than the main water pressure line.

**Adjustable mixing rate**

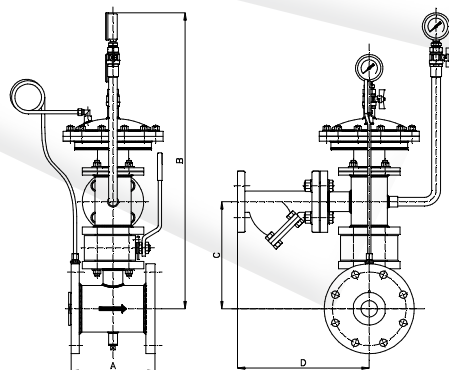
An optional valve can be assembled between the lower Venturi on the water line and the upper balancing section, allowing to adjust the device mixing ratio, which allows to use the same mixer with foaming agents working at a different percentages. Therefore a proportioner designed for 6% mixing ratio can work with a 3% foaming agent when required.

These mixers carry a RINA Type Approval Certificate, which is available on request.

STANDARD



OPTIONAL



Code (standard)	Flange Water		Flange Foamer		A	B	C	D	W
	PN16	ANSI 150	PN16	ANSI 150	mm	mm	mm	mm	kg
URD 0100 G1 XY	DN 100	4"	DN 40	1 ½"	205	661	198	120	57
URD 0125 G1 XY	DN 125	5"	DN 40	1 ½"	250	673	210	120	61
URD 0150 G1 XY	DN 150	6"	DN 50	2"	300	729	266	135	76
URD 0200 G1 XY	DN 200	8"	DN 50	2"	400	749	286,5	135	93
URD 0250 G1 XY	DN 250	10"	DN 65	2 ½"	500	785	322	145	147
URD 0300 G1 XY	DN 300	12"	DN 65	2 ½"	600	813	350,5	145	177
URD 0350 G1 XY	DN 350	14"	DN 65	2 ½"	690	830	367	145	215

Code (optional)	Flange Water		Flange Foamer		A	B	C	D	W
	PN16	ANSI 150	PN16	ANSI 150	mm	mm	mm	mm	kg
URD 0100 MMXY	DN 100	4"	DN 40	1 ½"	205	725	262	322	72
URD 0125 MMXY	DN 125	5"	DN 40	1 ½"	250	737	274	322	76
URD 0150 MMXY	DN 150	6"	DN 50	2"	300	805	342	367	95
URD 0200 MMXY	DN 200	8"	DN 50	2"	400	825	362,5	367	112
URD 0250 MMXY	DN 250	10"	DN 65	2 ½"	500	885	422	437	179
URD 0300 MMXY	DN 300	12"	DN 65	2 ½"	600	913	450,5	437	209
URD 0350 MMXY	DN 350	14"	DN 65	2 ½"	690	930	467	437	247

**Materials**

Mixer body

Inox AISI 304/316

Venturi nozzle

Bronze

Automatic valve parts

AISI 316 stainless steel

Mix ratio valve

Body carbon steel

Ball AISI 316 stainless steel

**Mix percentage**

The codes given in the above table refer to a mix percentage of 3%. Please refer to following page for complete coding information.



### Order Code

To have a precise identification of required product, the order code must be completed as in the following.

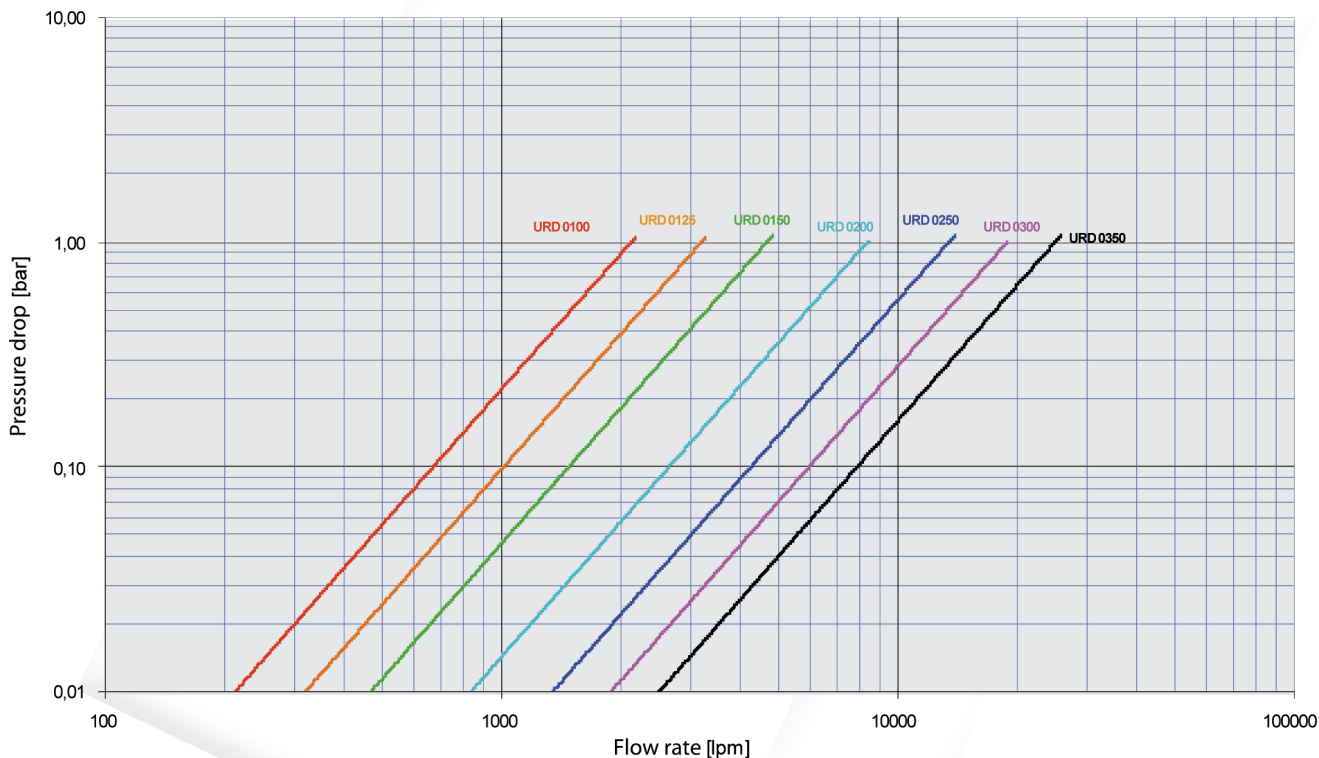
URD 0125 G1 X Y Z

**X** Flange type  
**Y** Mixing percentage  
**Z** Model of mixer

A = UNI Flange  
 3 = 3% Mixture  
 R = Regulating

B = ANSI Flange  
 6 = 6% Mixture  
 - = Fixed Percentage

### Pressure drop diagram for URD mixers



### User manual

A complete user manual, including service instructions and spare parts list is available at our offices upon request and at no cost for our customers.



CTG FF12 BR

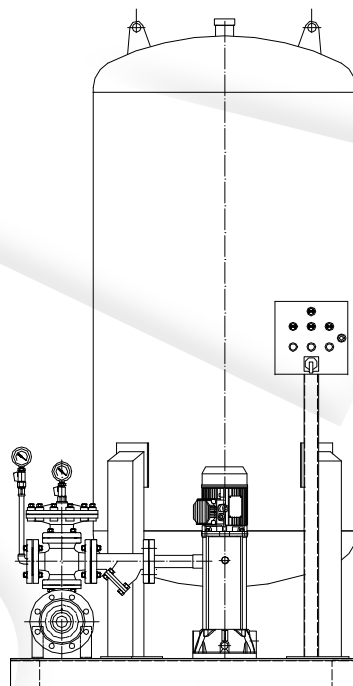


**FOAM MIXERS*****Independent mixing unit***

This system is designed as a replacement for bladder tanks in those cases where an emergency electrical line is available, and works with a balanced pressure proportioner where the foaming agent is supplied from a simple atmospheric pressure tank by means of a pump powered by an electro-motor.

Sensible advantages in terms of lower investment cost, ease of refilling the foaming agent change and no bladder to be replaced are immediately apparent to service technicians.

Such systems can be designed making use of any of the URD proportioner types shown in the previous pages, and with the foaming agent tank capacity required, therefore we are not showing any standard types and design each one of these systems based on the customer requirements.

**Materials**

Mixer	Cast iron/Stainless Steel
Pump	Stainless Steel
Frame&Tank	Carbon Steel
Surface coating	Epoxy primer / Polyurethanic enamel RAL 3000

**Technical characteristics**

Capacity	From 1000 l up to 10.000 l
Foam mixer	URD 100
Pump type	Centrifugal Pump

A wide series of mixer types, tank capacities and pump performance can be combined, to follow any customer request.

**Order Code**

To have a precise identification of required product, the order code must be completed with this code:

URE 0100 X Y Z

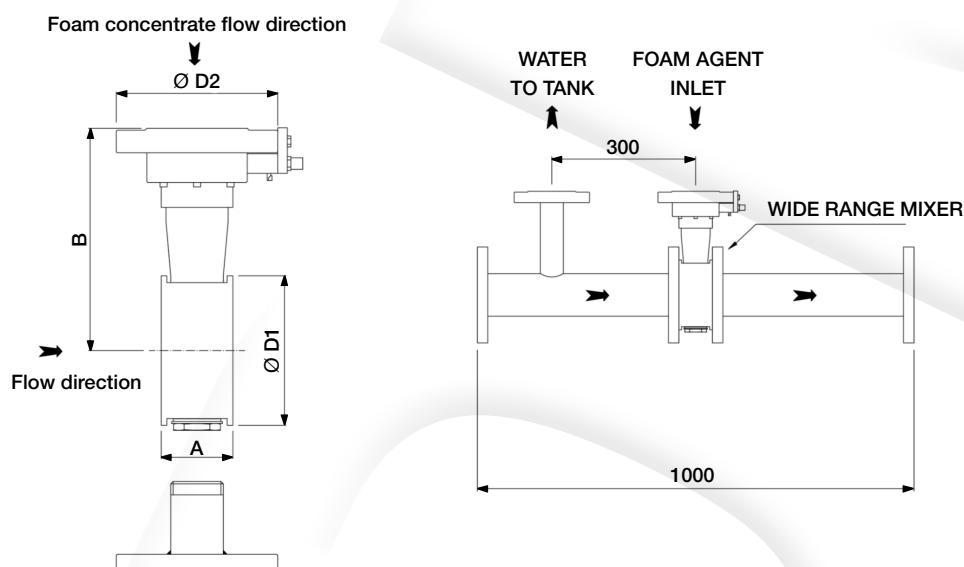
<b>X</b>	Mixing percentage	3 = 3% Mixture	6 = 6% Mixture
<b>Y</b>	Model of mixer	R = Regulating	- = Fixed Percentage
<b>Z</b>	Foaming agent tank capacity		

The product shown in this page has a very flexible design and can be developed considering the customer requests.

This very special mixer offers a very extended capacity range and is expressly designed for such systems where a large number of spray devices can be totally or partially required in use.

The mixer is built up from totally machined parts without castings, which makes it possible a construction in bronze, stainless steel and any other special alloy.

The lower part including the Venturi profile mixing area has a wafer design, that allows an easy assembly with flanges of any type.



### Materials

Body

Brass

AISI 316L stainless steel

Inner parts

AISI 316 stainless steel

Code	A mm	B mm	D1 inches	D2 inches	Capacity lpm	Press. drop bar	Ratio %	K factor	W kg
URI 100 T1 W	70	210	4"	2"	80/2450	0,2 - 2	3	2.038	15
URI 150 T1 W	70	240	6"	2"	110/5500	-	-	4.560	23
URI 200 T1 W	82	290	8"	3"	125/10500	-	-	8.640	39
URI 250 T1 W	82	322	10"	3"	150/16000	-	-	13.000	48

## FOAM MIXERS

### Small capacity bladder tanks



The same principle of the bladder tank can also be applied to build smaller devices for special applications in restricted spaces.

A typical application is the protection of railway or highway tunnels, by locating one device at predetermined distances along the tunnel section to be protected.

Such devices are delivered complete with Venturi mixers, and all necessary valves in the water inlet line, mix exit line and the two filling lines.

General specification, manufacturing norms and construction materials are the same as listed at page 15 for bigger models.

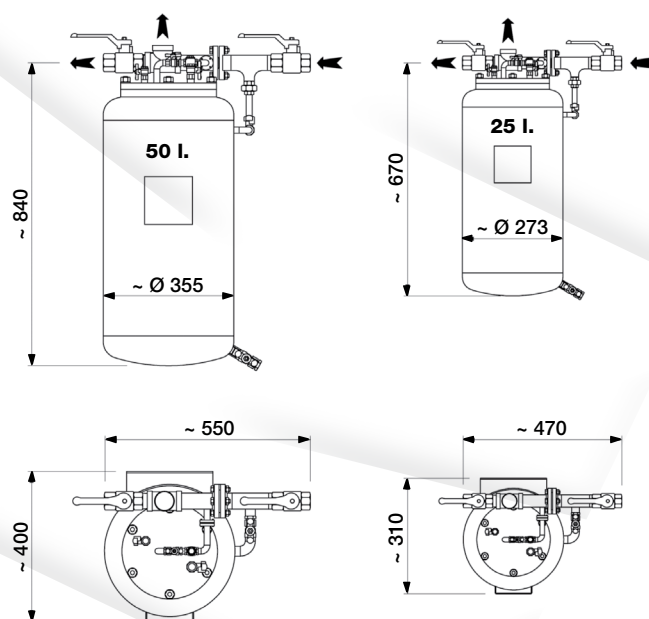
Capacities available are for 25 and 50 litres.

All valves made out of nickel plated brass.

#### Options

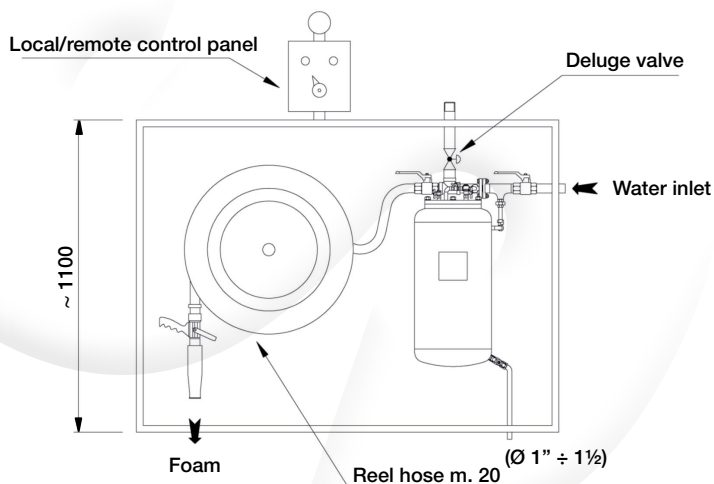
Body Stainless steel

Flange connections



#### Wall construction

For added convenience these small capacity mixers can be delivered pre-assembled in a steel box containing an hose reel for being mounted on a wall as a self-contained unit. Please ask for detailed information.





Since many years SDM manufactures high quality monitors, showing a perfect inside surface finish which allows for superior values of throw.

In addition our range is a very complete one and covers all the requirements for professional fire-fighting systems, including the most sophisticated remote control models.

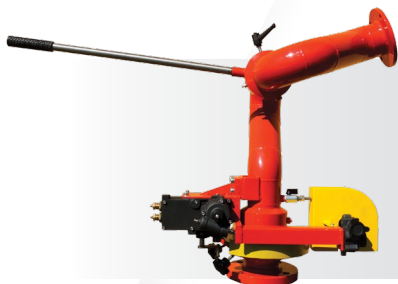
Our range of monitors is shown in the following pages and organized in different groups, by type of monitor operation. Accessories and equipment related to monitors like poles are shown at the end of this section.



PAGE 26

## MANUAL CONTROL

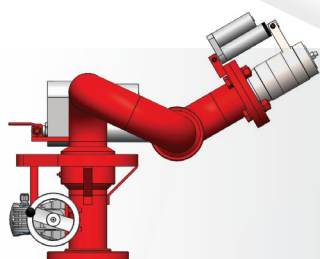
Here lever and wheel operated monitors are shown. They are available in any possible combination



PAGE 28

## AUTOMATIC OSCILLATION MONITORS

These models are operated by the classic water turbine device, taken to perfection through years of continuous improvement



PAGE 30

## ELECTRIC DRIVE MONITORS

A perfect device, also available as ATEX model and/or fitted with remote control

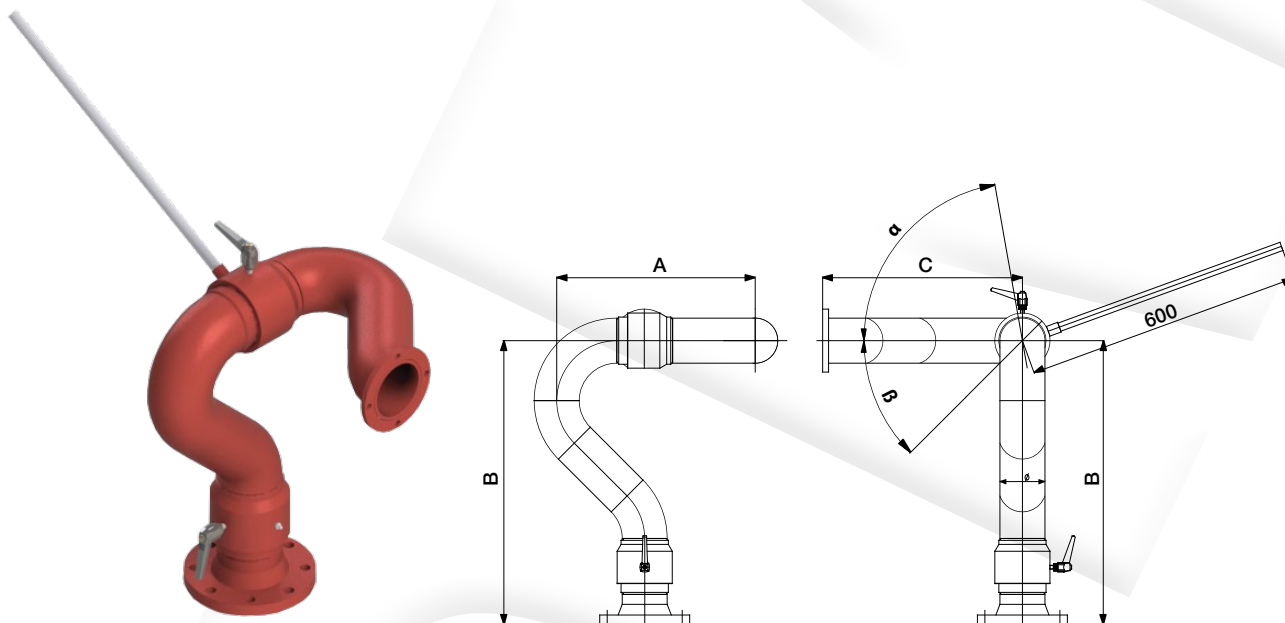
PAGE 31

## HYDRAULIC DRIVE MONITORS

A real high class product, including the most modern and proven components, also delivered with remote control.

**MONITORS****Manual control**

The monitors shown in this page are built in three different sizes, these monitors are supplied only for manual operation through a lever and can be locked in position by means of locknuts with hand wheel on both bearings. This model is available with a different size for inlet flanges, while the outlet connection is always obtained with an our standard flange.



Code	Body Size inches	Material	A mm	B mm	C mm	α °	β °	Weight kg	Flow Rate (up to) lpm
URA A200 A1x	2.5"	Carbon Steel	292	388	288	70	65	20	2000
URA A300 A1x	3"	Carbon Steel	276	428	322	80	60	30	3000
URA A300 B2x	3"	Stainless Steel	443	583	434	80	60	30	3000
URA A600 A1x	4"	Carbon Steel	460	575	365	80	60	45	6000
URA A600 B2x	4"	Stainless Steel	505	720	507	80	60	45	6000

**Materials****Swivel balls**

Stainless steel AISI 304

**Inlet Flange**

ASTM A 105 – AISI 304/AISI 316

**Surface coating**

Epoxy primer / Polyurethanic enamel RAL 3000

**Technical characteristics**

Rotating joints on double balls track

**Inlet flange:** ANSI 150 RF or UNI – DIN

Suitable for every kind of throwing device, foam or water.

**Pressure****Design pressure**

16 bar

**Operation pressure**

12 bar

*(recommended)***Order code**

To have a precise identification of required product, the order code must be completed with this code:

**X** A > UNI Inlet flange

B &gt; ANSI Inlet flange

## MONITORS

### Hand wheel control

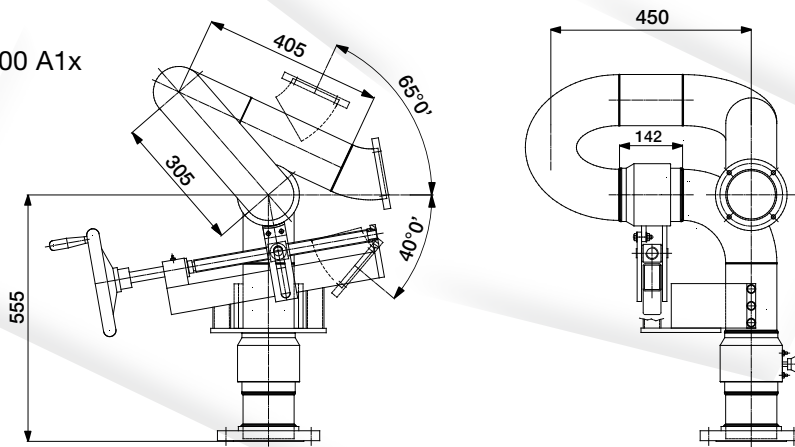


These monitors are supplied only for manual operation through one or two hand wheels.

The model with hand wheel control on elevation only can be locked in any horizontal position by means of a locking handle on the lower bearing.

The outlet connection of these models is always obtained with an our standard flange.

#### ■ One hand wheel model - URA B400 A1x

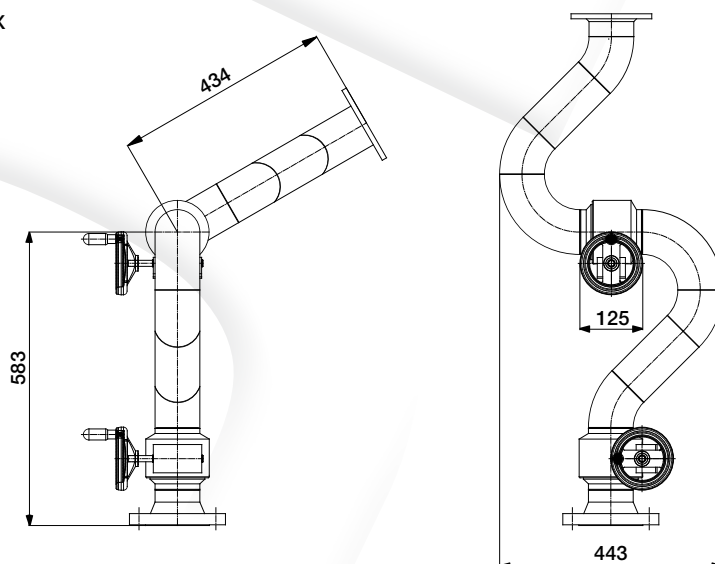


**Body size:** 4"

**Flow rate:** up to 4000 lpm

**Approximate weight:** 50 kg

#### ■ Two hand wheels model - URA C300 A1x



**Elevation:** Rotation by hand wheels

**Vertical adjustment:** Virtually unlimited

**Rotating gear:** Bronze – AISI 304/AISI 316

**Body size:** 3"

**Flow rate:** up to 3000 lpm

**Approximate weight:** 30 kg

#### FOR BOTH MODELS:

##### Materials

<b>Body</b>	Carbon Steel or stainless steel AISI 304/AISI 316
<b>Inlet Flange</b>	ASTM A 105 – AISI 304/AISI 316
<b>Surface coating</b>	Epoxy Primer / Polyurethanic enamel RAL 3000
<b>Stainless steel version</b>	Brushed surface finish

##### Technical characteristics

Rotating joints on double balls track

**Inlet flange:** ANSI 150 RF or UNI – DIN

Suitable for every kind of throwing device, foam or water.

##### Pressure

**Design pressure** 16 bar

**Operation pressure** 12 bar  
(recommended)

##### Order code

To have a precise identification of required product, the order code must be completed with this code:

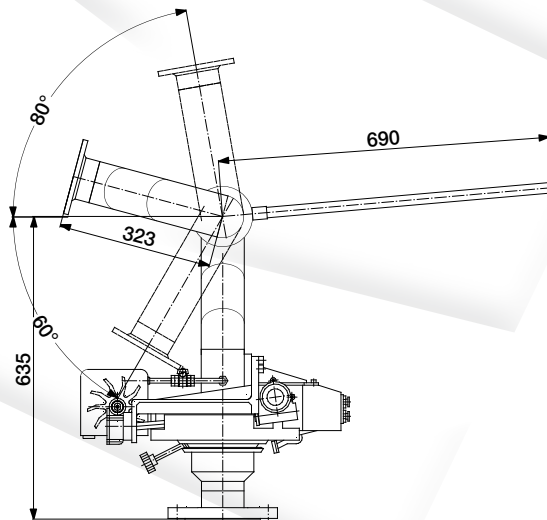
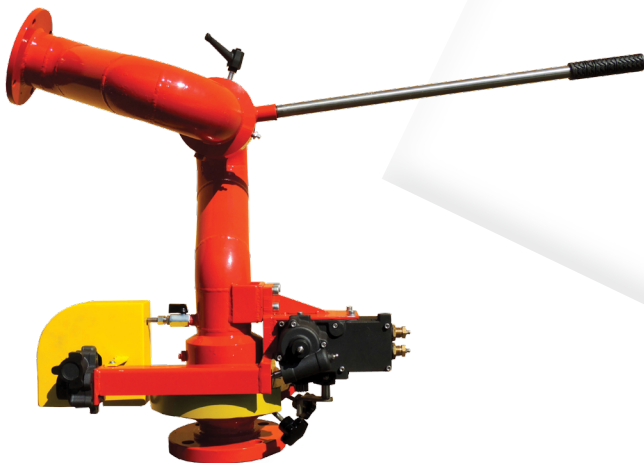
- X** A > UNI Inlet flange  
B > ANSI Inlet flange

## MONITORS

**Automatic oscillation monitors****URA D300 A1x**

These monitors are built with a water self swinging system which provides movement in the horizontal plane and an adjustable upper joint with a lever for elevation control.

The outlet connection of these models is always obtained with an our standard flange.



**Rotating gear:** AISI 304/AISI 316

**Body size:** 3"

**Flow rate:** up to 3000 lpm

**Approximate weight:** 40 kg

**Materials****Body**

Carbon Steel or stainless steel AISI 304/AISI 316

**Inlet Flange**

ASTM A 105 – AISI 304/AISI 316

**Surface coating**

Epoxy Primer / Polyurethanic enamel RAL 3000

**Technical characteristics**

Rotating joints on double balls track

**Inlet flange:** ANSI 150 RF or UNI – DIN

Adjustable swinging field from 0° to 350°

Light alloy gear box

**Pressure**

**Design pressure** 16 bar

**Operation pressure** 12 bar

(recommended)

**Order code**

To have a precise identification of required product, the order code must be completed with this code:

**X** A > UNI Inlet flange

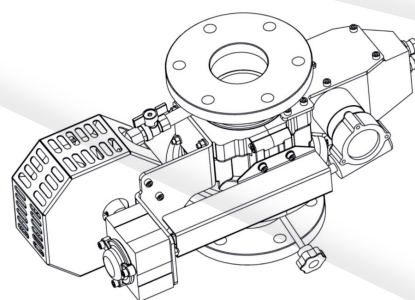
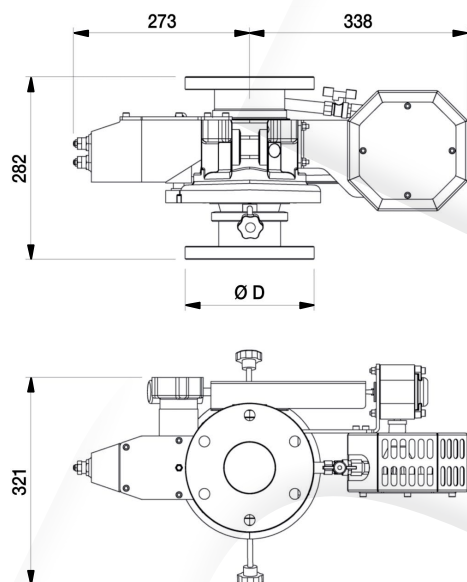
B > ANSI Inlet flange



Our self swinging unit is based onto the classical design where a water driven turbine wheel supplies the energy to rotate the monitor through a gear train.

Our long experience, which has been built over thousands of units supplied in the last thirty years, makes it possible to reach a very high degree of reliability in operation together with the very good resistance to weather conditions obtained by the choice of the best quality materials and surface treatment.

This unit can be retro fitted to each one of our standard hand control monitors in order to change it into a self swinging one, or can be disassembled from a self swinging one in case of malfunction still leaving the monitor fully available albeit with hand control.



### Materials

**Body** (pipes and joints)

AISI 316 stainless steel

**Swivel balls**

Phosphorus bronze

**Inlet flange**

DIN ND16 Carbon steel (AISI 316 / ANSI 150 as an option)

**Surface coating**

Epoxy / Polyurethane red RAL 3000

### Specification

**Design pressure**

16 bar

**Operation pressure**

12 bar

*(recommended)*

**Water requirement** (7 bar)

20 lpm

**Rotation rate** (7 bar)

5° per second

**Rotation range**

15° to 360°

**Weight**

18 kg

**Maximum water capacity** (7 bar)

5.000 lpm

**Inlet flange**

3" / 4"

Many optional designs are available, like monitors with an elevation joint only, or with hand lever control, whose specifications are available to our customers upon request.

## MONITORS

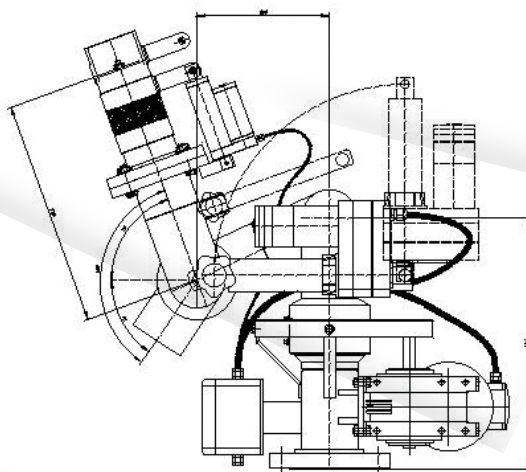
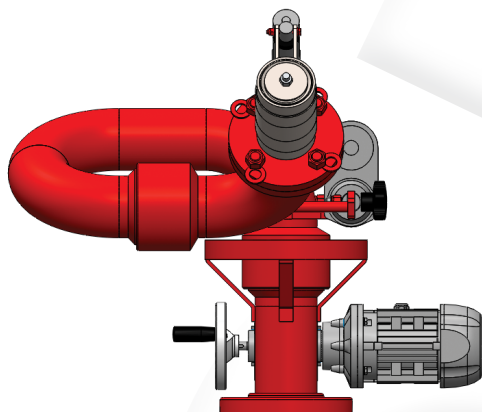
*Electric drive monitors*

## URA H700 A1x

This monitor is fitted with two electric motors which provide movement to the direction and elevation swivel joints, allowing therefore complete remote control for the monitor.

Both electric drive units are fitted with an emergency hand wheel in case of malfunction.

The outlet connection of these models is always obtained with an our standard flange.



**Body size:** 4"

**Flow rate:** up to 7000 lpm

**Approximate weight:** 90 kg

**Materials**

<b>Body</b>	Carbon Steel or AISI 304/AISI 316
<b>Inlet Flange</b>	Carbon Steel or AISI 304/AISI 316
<b>Rotation gear box</b>	AISI 316 L
<b>Surface coating</b>	Epoxy Primer / Polyurethanic enamel RAL 3000
<b>Stainless steel version</b>	Brushed surface finish

**Technical characteristics**

**Inlet flange:** ANSI 150 RF or UNI – DIN

Rotating joints on double balls track

Continuous rotation field of 355°

Elevation with reduction gear IP65 or Ee-XD

Rotation with reduction gear IP65 or Ee-XD

Electric adjustable nozzle IP65 or Ee-XD

Suitable for every kind of throwing device, foam or water.

**Pressure**

**Design pressure** 16 bar

**Operation pressure** 12 bar  
(recommended)

**Order code**

To have a precise identification of required product, the order code must be completed with this code:

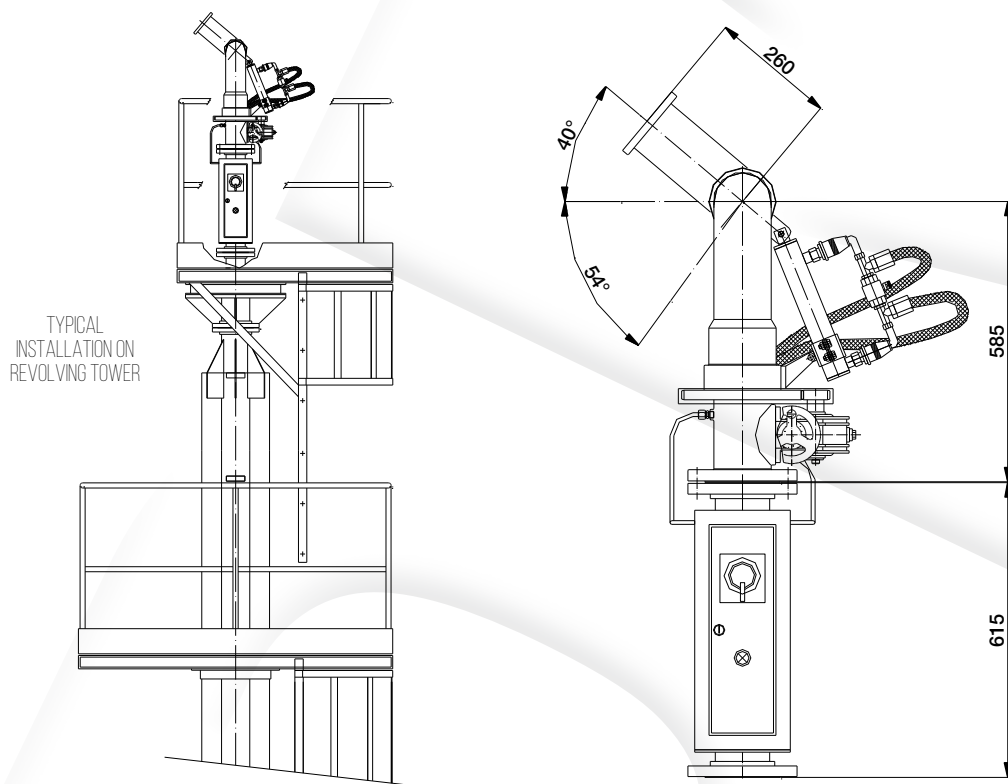
- X**    A > UNI Inlet flange  
      B > ANSI Inlet flange

### URA N500 A1x

This monitor is fitted with two hydraulic motors which provide movement to the direction and elevation swivel joints, allowing therefore complete remote control for the monitor.

Both hydraulic drive units are fitted with an emergency hand wheel in case of malfunction.

The outlet connection of these models is always obtained with an our standard flange.



**Body size:** 4"

**Flow rate:** up to 5000 lpm

**Approximate weight:** 80 kg

### Materials

<b>Body:</b>	Carbon Steel or AISI 304/AISI 316
<b>Inlet Flange:</b>	Carbon Steel or AISI 304/AISI 316
<b>Rotation gear box:</b>	AISI 316 L
<b>Surface coating:</b>	Epoxy Primer / Polyurethanic enamel RAL 3000
<b>Stainless steel version:</b>	Brushed surface finish

### Technical characteristics

**Inlet flange:** ANSI 150 RF or UNI – DIN

Rotating joints on double balls track

Continuous rotation field of 360°

Complete with power pack on board

Suitable for every kind of throwing device, foam or water.

### Pressure

**Design pressure** 16 bar

**Operation pressure** 12 bar  
(recommended)

### Order code

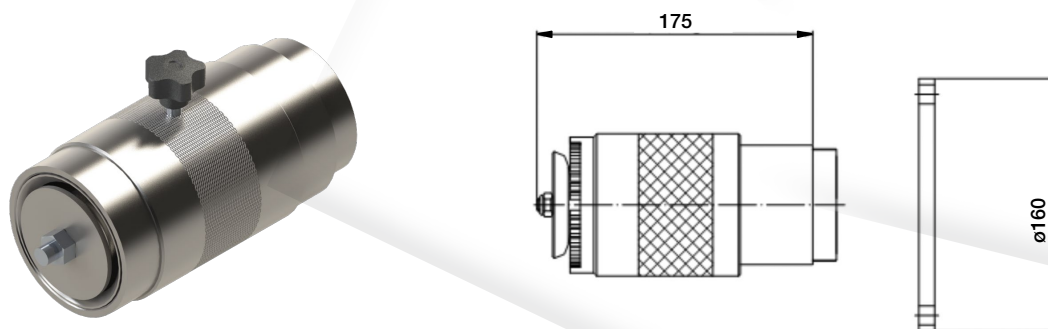
To have a precise identification of required product, the order code must be completed with this code:

- X A > UNI Inlet flange
- B > ANSI Inlet flange

**MONITORS****End devices / Adjustable nozzles**

These nozzles can be fitted through their male thread connection directly onto the monitor pipe, and produce a variety of jets with different spray angles, from a powerful straight jet to a very wide angle one.

■ **Adjustable water nozzle - mod. URQ-A**

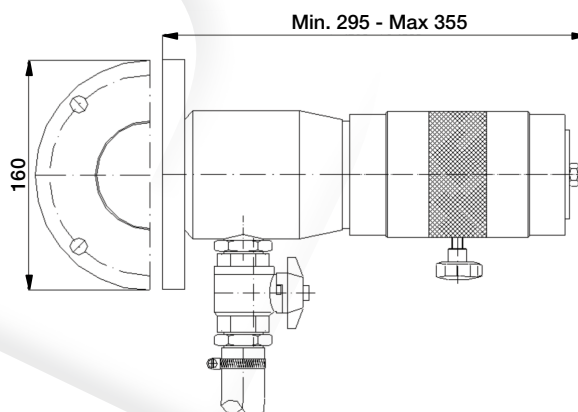


Approximate weight: 6 kg

■ **Adjustable foam nozzle - mod. URQ-B**

A pick-up hose at the bottom allows for foam agent to be sucked by an internal Venturi mixer and injected into the water stream with different percentage [0 – 3 – 6].

Foam is then produced, with a normal expansion ratio of 1:4, depending upon foam agent.



Approximate weight: 10 kg

**FOR BOTH MODELS:**

**Materials**

<b>Body:</b>	Bronze - Brass - Light alloy - Stainless steel AISI 304/316
<b>Diffuser:</b>	Bronze - Brass - Light alloy - Stainless steel AISI 304/316
<b>Inlet Flange:</b>	ASTM A 105 or AISI 304/AISI 316
<b>Flange surface coating:</b>	Epoxy Primer / Polyurethanic enamel RAL 3000 (only for carbon steel)

**Technical characteristics**

**Flow rate:** 500 a 3000 Lpm

**Body size:** 3"

**Pressure**

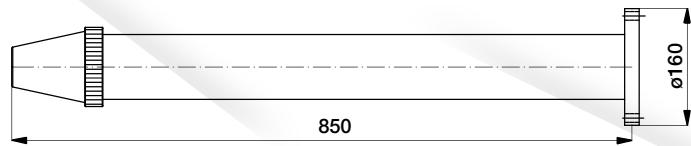
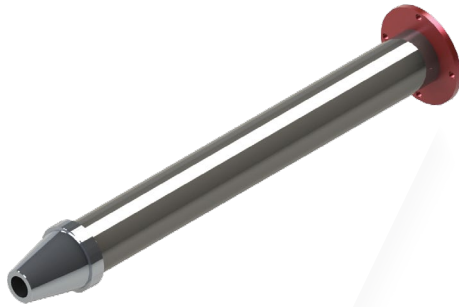
Design pressure 16 bar

Operation pressure 12 bar

(recommended)



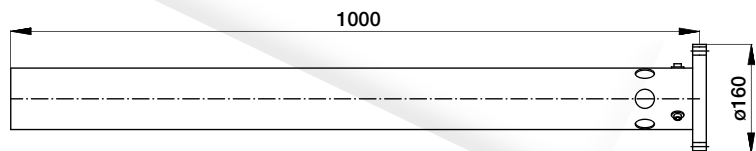
■ **Water branchpipe - mod. URS**



Code	Body Size inches	Flow rate lpm	Weight kg
URS xB3	3"	800-2500	8
URS xB3	4"	2600-6000	9

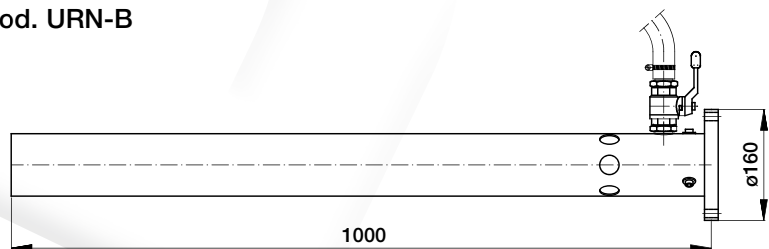
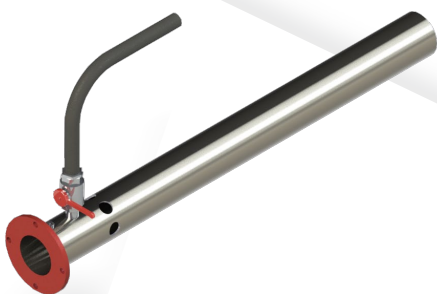
Water nozzle: Light Alloy

■ **Foam branchpipe - mod. URN-A**



Code	Body Size inches	Flow rate lpm	Weight kg
URN Ax A1	3"	500-3000	8
URN Ax A1	4"	3100-6000	9

■ **Self-aspirating foam branchpipe - mod. URN-B**



Code	Body Size inches	Flow rate lpm	Weight kg
URN Bx B3	3"	500-3000	8
URN Bx B3	4"	3100-6000	9

Suction valve material: Chromed brass  
Foaming mixing ratio: 6%

**FOR ALL BRANCHPIPE MODEL:**

**Materials**

Branchpipe Body	Stainless Steel AISI 304 / AISI 316
Flange	ASTM A 105 or AISI 304/AISI 316
Flange surface coating	Epoxy Primer / Polyurethane enamel RAL 3000
Stainless Steel Parts	Brushed surface finish

**Technical characteristics**  
Inlet Flange: Standard SDM

**Order code**

To have a precise identification of required product, the order code must be completed with this code:

**X** Flow rate

**MONITORS****Platform towers****Platform design**

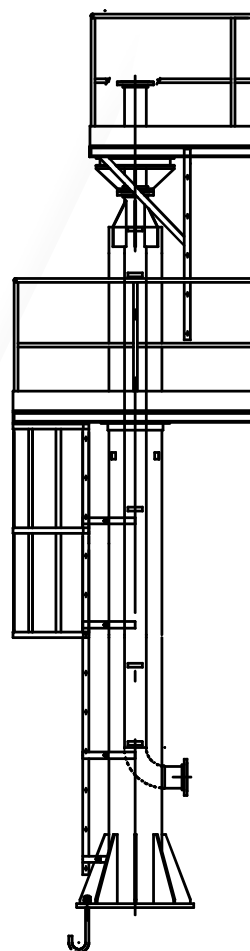
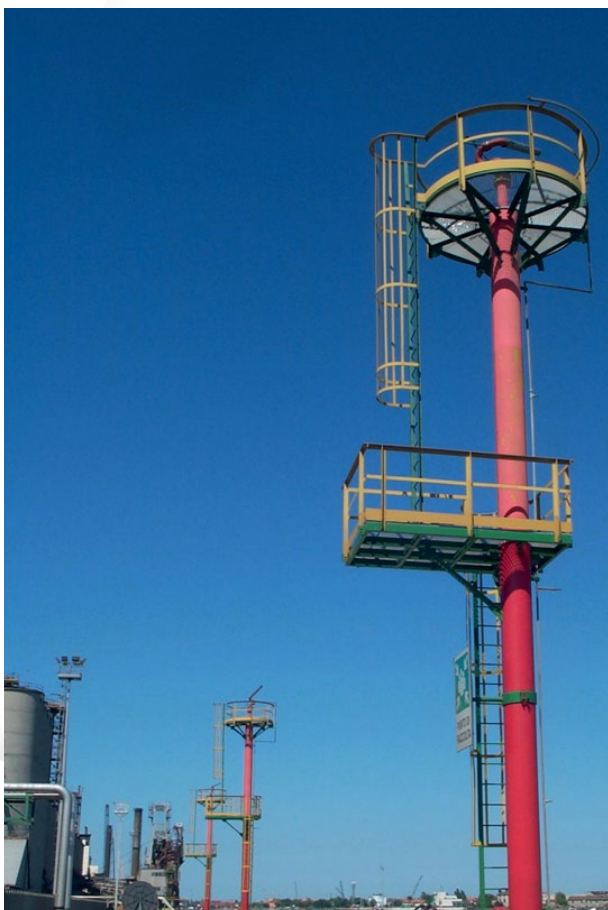
A variety of platforms, either fixed or rotating can be supplied on customer specification. Our platform are designed to host monitors working at 16 bar, normally being operated at 12 bars. The steel structure is designed to withstand wind velocity of 130 km/h, and weighs in the usual height of 10 meters 1670 kg.

**Materials**

Structure	Carbon steel
Surface treatment	Epoxy paint RAL 3000

**Options**

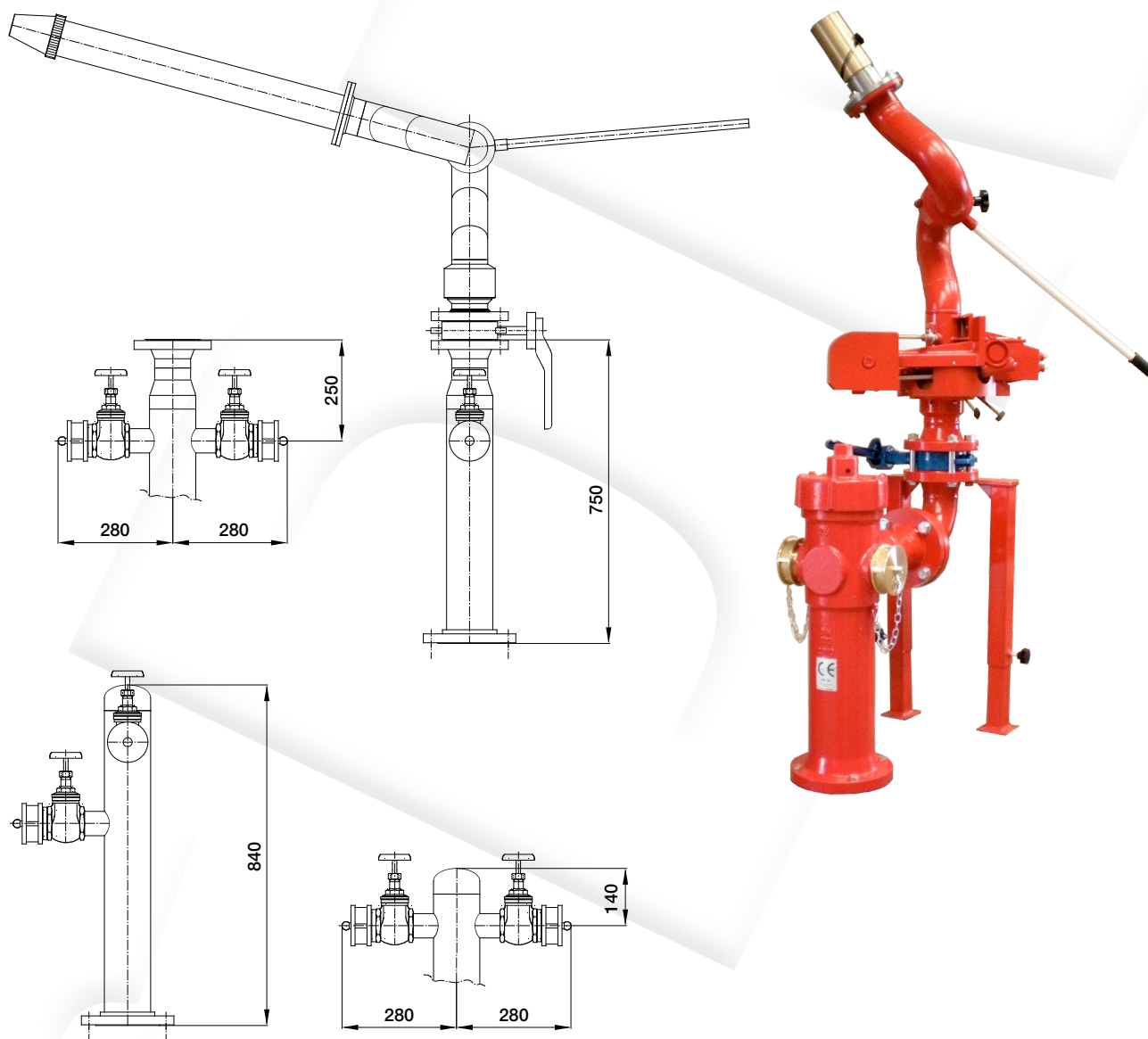
Surface treatment	Hot dip galvanizing
Tower height	To customer specification



Several types of hydrants can be supplied, for any kind of necessity and environment; typically, they can be grouped into these typologies:

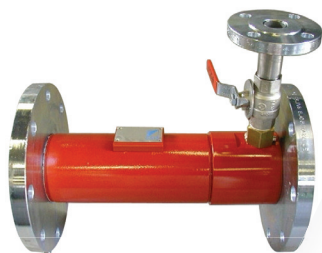
- Carbon steel pillar hydrants
- Carbon steel pillar hydrants with monitor
- Cast iron hydrant, self-draining type
- Cast iron hydrant, self-draining type with monitor

The sizes, for all kinds of hydrant, can vary from 3", 4", 6" and in any case, the number and the size of the outlets, must be specified.



## Technical characteristics

<b>Body</b>	Carbon Steel - AISI 304 / AISI 316
<b>Inlet</b>	Flanged ANSI 150 RF or UNI - DIN
<b>Flange material</b>	ASTM A 105 - AISI 304 / AISI 316
<b>Available sizes</b>	3" - 4" - 6"
<b>Number and size of outlet</b>	on request
<b>Gate valves and couplings</b>	in brass - bronze
<b>Couplings codes</b>	UNI and all International Std
<b>Painting</b>	1 coat of epoxy primer and 2 coats of polyurethanic enamel RAL 3000 in the carbon steel version
<b>Monitor base butterfly valve</b>	in cast iron

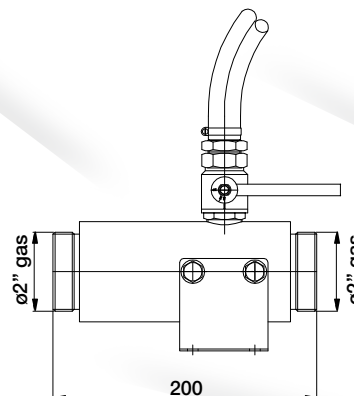
**IN LINE VENTURY MIXERS**PAGE **37****HIGH EXPANSION  
FOAM GENERATORS**PAGE **41****LOW EXPANSION WATER / FOAM NOZZLES**PAGE **42****FOAM CHAMBERS AND LANCES**PAGE **44****MOBILE MONITOR TRAILERS**PAGE **47**



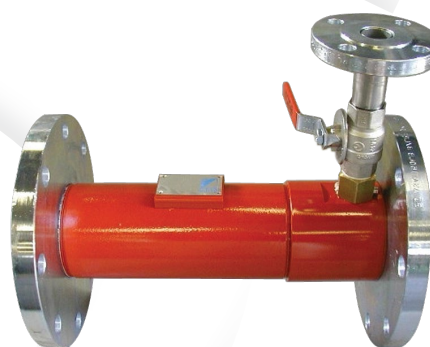
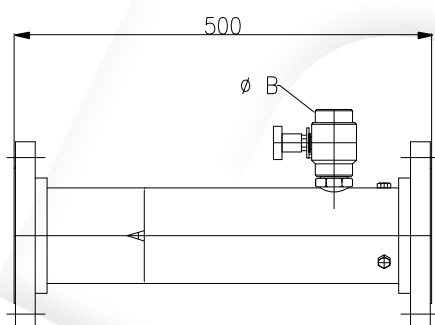
In line foam mixers work on the Venturi effect, where the water flow is sent through a restricted orifice in which the pressure value is lowered so much that the foam agent is aspirated from an ambient pressure tank and injected into the water flow.

Care must be taken from the system designer in having available precise figures about the local pressure value in all the system points following the mixer exit port, since the system will not work if the pressure drop between the mixer outlet and the jet device is higher than the pressure available at the mixer.

In the table below we give for each model of mixer, in addition to the nominal flow value, the average figure of pressure drop as a percentage of the inlet pressure which is lost through the device.



Code	Flow rate <i>Lpm</i>	Op press <i>bar</i>	Mix ratio <i>%</i>	Press drop <i>%</i>	D <i>inches</i>	W <i>kg</i>
URF-F313	100	7	3/6	30	2"	7
URF-F323	200	7	3/6	30	2"	
URF-F343	400	7	3/6	30	2"	



Code	Flow Lt/l' @bar <i>Lpm</i>	A <i>inches</i>	B <i>inches</i>	Flange in <i>inches</i>	Flange out <i>inches</i>	Weight <i>kg</i>
URF-L3	500 - 900	3"	¾"	3"	3"	8
URF-L4	1000 - 2500	4"	1"	4"	4"	12
URF-L6	2600 - 3500	6"	1½"	6"	6"	16

#### Mix percentage coding

The above injectors are available with 3% or 6% calibrated orifice, the codes in the table refer to 3%

**URF F323 T5Y = 3%**

**URF F326 T5Y = 6%**

#### Materials

Body	T5 - Bronze
Outer pipe	B3 - Stainless steel
Inner profile	V1 - Light alloy
Pickup pipe	Reinforced PVC hose (2,5 m)

#### Connection Options

Please replace the Y in the above code with the desired coding as shown below

Threads	UNI	U
	STORZ	S
	BSS	V
Flanges	DIN ND16	E
	ANSI 150	F

## FOAM EQUIPMENT

## Foam concentrate tanks



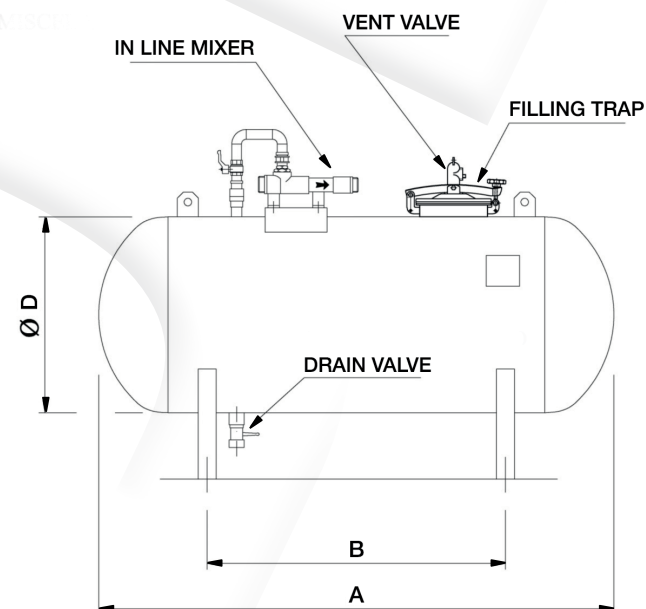
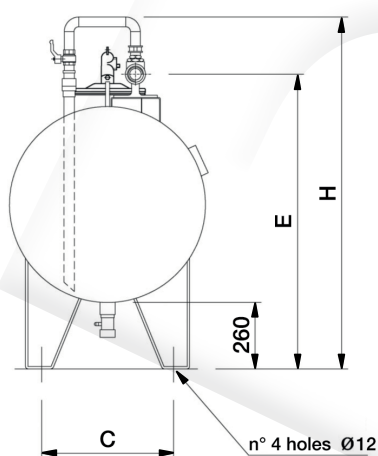
Concentrate tanks can be fitted with any one of the URF series in line Venturi mixers shown at the previous page, placed on the top and aspirating foam concentrate from the tank itself.

They need therefore just a water supply to be able to feed a foam producing device or system.

Tanks are designed with all accessories required for proper operation, like a vent valve, filling trap and drain valve.



## URF



Code	Capacity litres	A mm	B mm	C mm	D mm	E mm	H mm	W kg
URV 0200 B2	200	1000	500	465	600	950	1150	93
URV 0400 B2	400	1550	900	465	600	950	1150	135
URV 0600 B2	600	1440	750	650	800	1150	1400	170
URV 1000 B2	1000	1500	750	760	1000	1350	1600	216

## Materials

Tank	A1 - Carbon steel
Filling trap	B2 - AISI 304 stainless steel
Pickup pipe	B2 - AISI 304 stainless steel
Painted parts	Red epoxy paint RAL 3000

## Options

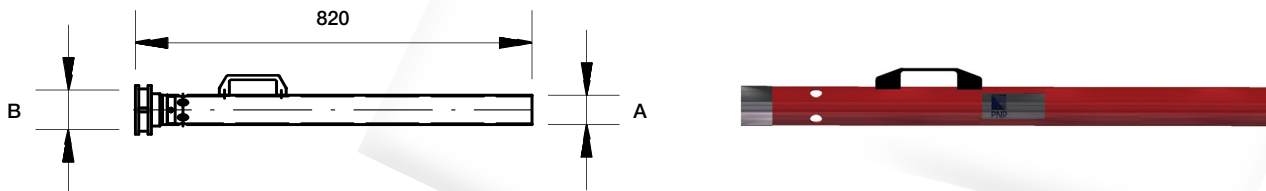
Tank	B2 - AISI 304 Stainless steel
Venturi mixer	See page 37

These light and efficient devices allow for production of low expansion foam when acting onto local fires with limited extension in all types of industries, or for equipping fire brigade trucks.

They are normally fed from an inline mixers as shown at [page 41](#).

The self suction types are the cheapest system for producing foam on small fires, and can be fitted with an adjustment valve for percentage mix.

The throw values, always in excess of 20 meters, makes them an effective device for the small local fires previously mentioned.



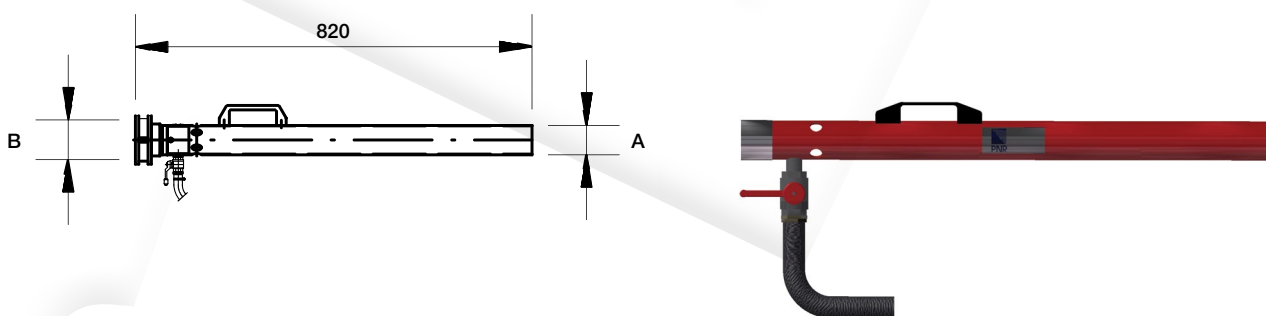
### Materials

Body	AISI 304 stainless steel	
Nozzle	Bronze	(Self suction types)
Pick up hose	Pvc w/internal steel cord spiral	(Self suction types)

### Pressure fed (\*) (+)

Code	Capacity Lpm (*)	Oper pressure bar	Throw m	Expansion ratio (+)	A inches	B	W kg
URB PA32 B3	200	3 to 10	22	1 : 8	1 ½"	UNI 45	4,5
URB PA34 B3	400		24		2"	UNI 70	6
URB PA36 B3	600		27		2"	UNI 70	6
URB PA38 B3	800		27		2"	UNI 70	6

\* Capacity values at 5 bar pressure  
+ Depending upon foaming agent



### Self suction (\*) (+)

Code	Capacity Lpm (*)	Oper pressure bar	Throw m	Expansion ratio (+)	A inches	B	W kg
URB PB32 B3	200	3 to 8	24	1 : 8	1 ½"	UNI 45	5.5
URB PB34 B3	400		26		2"	UNI 70	5.5
URB PB36 B3	600		29		2"	UNI 70	8.5
URB PB38 B3	800		29		2"	UNI 70	8.5

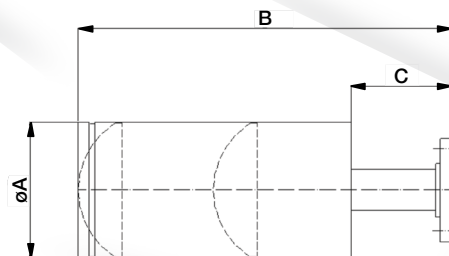
\* Capacity values at 5 bar pressure  
+ Depending upon foaming agent

### Coupling coding

These lances are produced with a 2" female BSP thread.  
Please contact our offices for alternative couplings.

**FOAM EQUIPMENT****Medium expansion foam generator**

These generators are built both in fixed or mobile design, where the mobile units have an handle for being transported and a thread connection accepting quick couplings, while the fixed design types have a flanged connection for being connected to a piping system. All units have a typical expansion ratio of 1:60, which can vary with the foam agent used.

**Materials**

Body	AISI 304/AISI 316 stainless steel
Spray nozzle	AISI 316 stainless steel
Connection (mobile)	Brass couplings
Connection (fixed)	Carbon steel ASTM A105 flange (option stainless)

Please ask our offices for additional connection styles.

Code	Flow lt At 5 bar	Coupling		Dia A mm	B mm	C mm	Weight kg
URG-M/F320	200	Flange 1 1/2"	UNI 45-70	204	550	150	7
URG-M/F340	400	Flange 2"	UNI 45-70	204	550	150	8
URG-M/F360	600	Flange 2"	UNI 70	204	550	150	10
URG-M/F380	800	Flange 3"	UNI 70	400	800	150	18
URG-F400	1000	Flange 3"		400	800	150	18
URG-F420	1200	Flange 3"		400	800	150	18
URG-F460	1600	Flange 3"		400	800	150	18

URG-**M** for fixed flanged nozzles

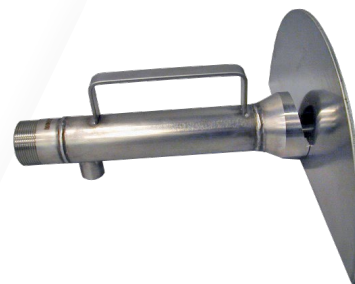
URG-**F** for mobile nozzles with couplings

**Water shields**

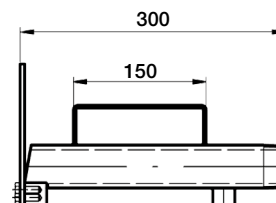
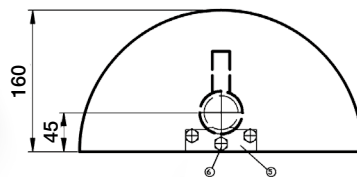
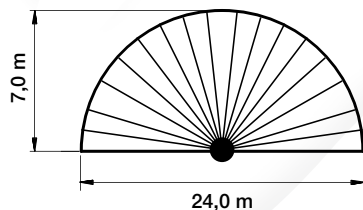
SDM heat shields are designed to protect personnel from the heating effects of a near fire through a water screen.

The table below shows the capacity of the different models, as well as the water screen dimensions in meters, for different feed pressure values. Heat shields are manufactured out of high quality AISI 316L stainless steel for optimum protection from corrosion and marine environment.

The product codes shown refer to the normally supplied types, with a male BSPT thread. We can quote upon request, for different thread types or the most popular quick couplings.

**Material**

B31 - AISI 316L stainless steel



180°	Code	INLET inches	Capacity Lpm at pressure (bar)				
			1	3	5	7	10
*	URC K150 B31B	1 + 1/2"	72	125	160	190	--
*	URC K200 B31B	2"	110	190	245	290	--
*	URC K250 B31B	2 1/2"	175	300	390	460	--



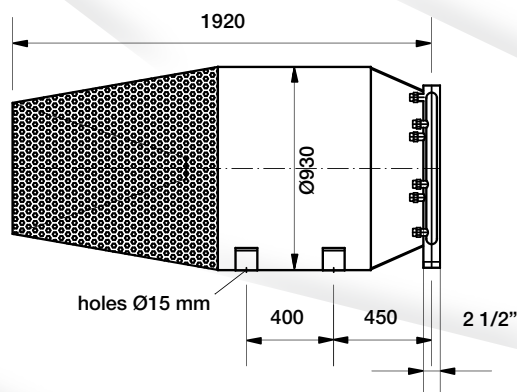
## FOAM EQUIPMENT

### High expansion foam generator



These foam generators serve the purpose of producing quickly volumes of foam sufficient to completely fill the volume to be protected, and are the right choice to protect the inside of large volume buildings. The long experience built up through manufacturing and installing of thousands of such devices allows us to assure our customers they are using a first class product which will produce excellent performance.

#### Static type

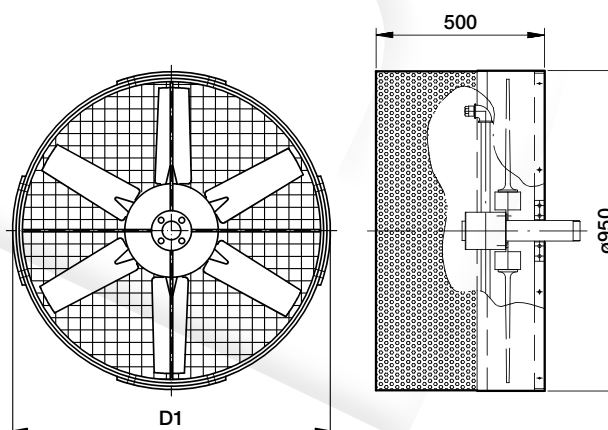


#### Materials

Body	B2 - AISI 304 stainless steel
Nozzles	T1 - Brass
Piping	A1 - Carbon steel, painted, RAL 3000
Inlet	2 1/2" BSP male thread, flange any standard or grooved lock

Code	Capacity lpm	Expansion rate	Coupling inches	W kg
URH 3200 B2	200	1 : 750	2 1/2"	65
URH 3400 B2	400		2 1/2"	65

#### Blown type



#### Materials

Body	B2 - AISI 304 stainless steel
Nozzles	T1 - Brass
Piping	A1 - Carbon steel, painted, RAL 3000

Code	Capacity lpm	Expansion rate	Coupling inches	W kg
URJ 3200 B2	200	1 : 750	2 1/2"	65
URJ 3400 B2	400		2 1/2"	65

#### Connections

The codes given in the tables refer to 2" male BSP thread  
 Modify the code as shown beside for ANSI 150 connection flange  
 Modify the code as shown beside for a DN50, ND16 DIN flange  
 Modify the code as shown beside for grooved lock

URJ 3200 B2 **LR**  
 URJ 3200 B2 **LF**  
 URJ 3200 B2 **LE**  
 URJ 3200 B2 **LG**

## FOAM EQUIPMENT

## Low expansion water / foam nozzle

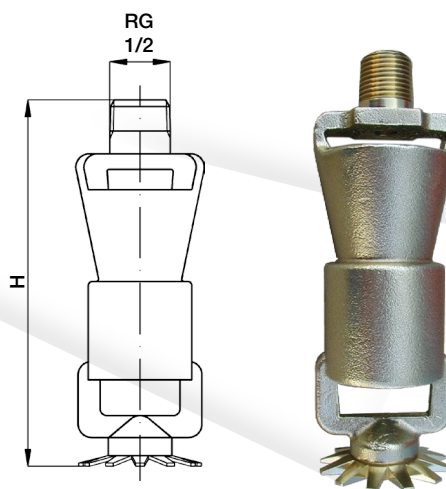
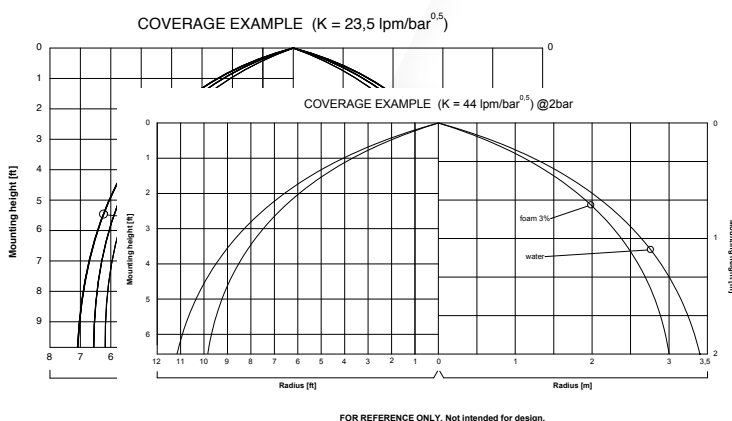


A classic fire fighting component, in the two models pendent and upright, made out of a cast brass body and an impact dish studied for optimal jet distribution.

The liquid mix of water and foam agent is first broken inside the body by impact onto a fixed member and then distributed by the bottom dish with an angle up 95° and an expansion ratio of about 1:7.

The applied density (flow per unit of area) of foam solution must meet the requirements of the Authority Having Jurisdiction for the type flammable liquid and occupancy. Per NFPA 16, coverage density must not be less than 0.16 GPM/ft<sup>2</sup> (6,52 mm/min) of floor area with a resulting minimum discharge pressure of not less than 30 psi (2,1 bar).

Foam-water sprinkler spacing must not exceed the requirements of NFPA 13 for extra hazard occupancies and the system must be hydraulically calculated to obtain the required density and discharge pressure.



URK-A

## Materials

Body T52 - Naval brass  
Dish B2 - AISI 304 stainless steel

## Options

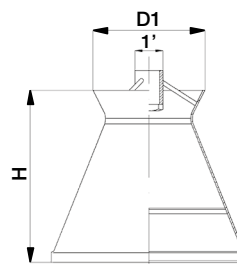
Nickel plated body

These nozzles provide a foam projection onto specific points where a fire hazard can be expected.

The nozzle is entirely made out of stainless steel, connection nipple, body and deflector plate and provides foam with an expansion rate of about 1:10.

## Pendent nozzle

Code	Capacity in lpm for pressure values in Bar				Weight kg	Expansion rate
	1.0	3.0	5.0	7.0		
URK A080 T52DB	36	62	80	95	0.54	1 : 7
URK A090 T52DB	40	69	90	106	0.54	
URK A100 T52DB	45	77	100	119	0.54	

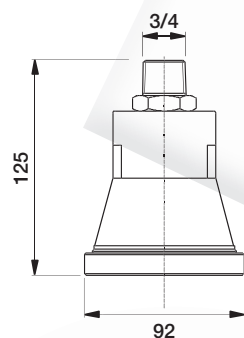


URK-C

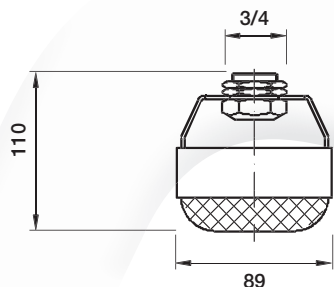
URK nozzles allow to obtain an expansion rate of 1:70 thanks to their double stainless steel screens. Their robust construction in high quality stainless steel makes them suitable for mobile service.

Code	Capacity in lpm for pressure values in Bar	Pressure range	Weight	Expansion rate
	5.0	bar	kg	
URK C058 B31	80	3 to 8	1.1	1 : 70

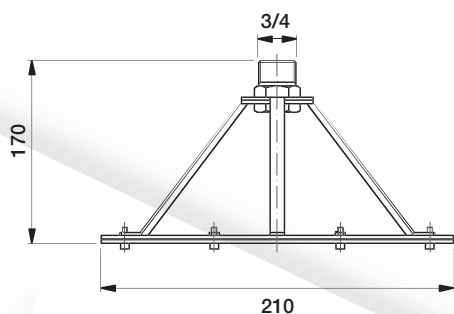
Medium expansion foam nozzles in the URK series have been designed according to the Venturi principle and produce a fractionated jet of foam mix which takes in air before impacting at high speed against a stainless steel mesh screen. Their expansion rate and inherent safety make them the best device for protection systems onto loading and unloading bays for hydrocarbon products.



URK-F



URK-G



URK-H



Code	Capacity in lpm for pressure values in Bar			Weight kg	Expansion rate (*)
	2.0	3.0	5.0		
URK F050 T5EB	21	37	50	1.20	1 : 17
URK G050 B2EB	39	47	50	0.70	1 : 20
URK G075 B2EB	54	66	85	0.75	1 : 20
URK G100 B2EB	63	78	100	0.75	1 : 20
URK H110 B2EB	90	110	140	1.60	1 : 17

(\*) Expansion rate values are given for pressure = 2 bar and differ based on the outlet mesh size and the foam concentrate type

### Materials

Mesh screen

Body

Nozzle

URK-F  
Other types

AISI 316 stainless steel

Brass

AISI 304

Brass

## FOAM EQUIPMENT

## Foam chambers and lances

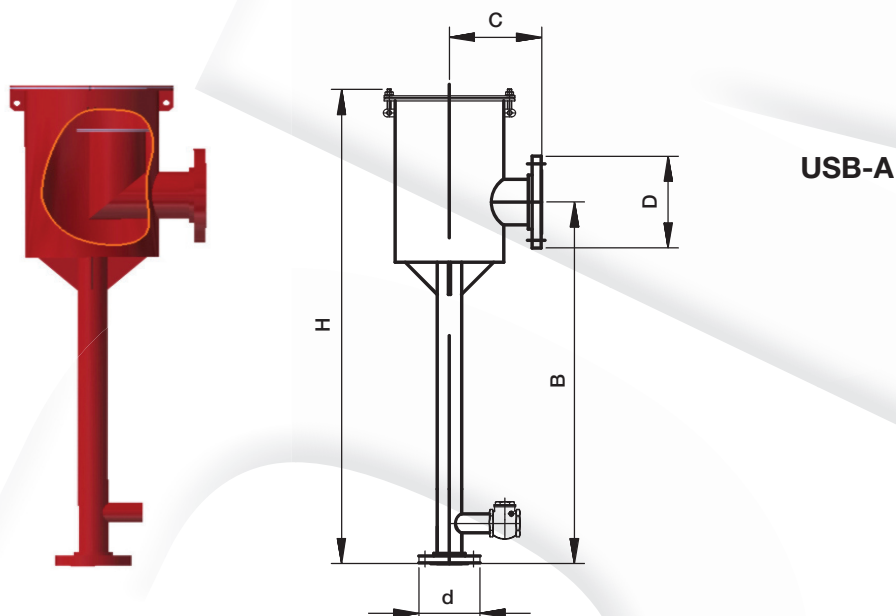


Foam chambers are meant for protection on fixed roof tanks, where the foam chamber is placed on the outside of the tank in the upper part and the foam pourer is assembled to deliver foam inside the tank, and have a built-in foam maker at inlet port.

Their design includes a glass diaphragm which is broken when the foaming mix is fed under pressure, this design avoiding the danger of vapours originated inside the tank to pass from the tank into the foam feed line.

We also offer a special ATEX model where the chamber cover is modified in such a way to avoid any possibility of sparks being generated when working onto it.

This model has bronze bolts and lifting ring, with a hinged cover to prevent sparks from impact.



Code	Capacity lpm	d inches	D inches	H mm	B mm	C mm	Weight kg
USB A020 A1KE	200	2"	3"	950	650	230	32
USB A040 A1LE	400	2"	4"	950	650	230	36
USB A080 A1ME	800	4"	6"	950	650	230	75
USB A150 A1PE	1500	4"	8"	1200	800	230	85
USB A200 A1PE	2000	4"	10"	1200	800	230	100

\* Above codes are meant for standard model and DIN ND 16 flanges

## Coding for options

ANSI 150 - A195 flanges	USB A020 A1K <b>F</b>	(Replace last letter with F)
ATEX compliant model	USB <b>B</b> 020 A1KE	(Replace model indicator with B)
Stainless steel model	USB A020 <b>B2</b> KE	(Replace material code with B2)

## Materials

Body	Carbon steel/stainless Steel
Flanges	Carbon steel ANSI
Diaphragm	Calibrated glass
Nozzle	AISI 304 stainless steel
Finish	Epoxy/Polyurethane paint RAL 3000



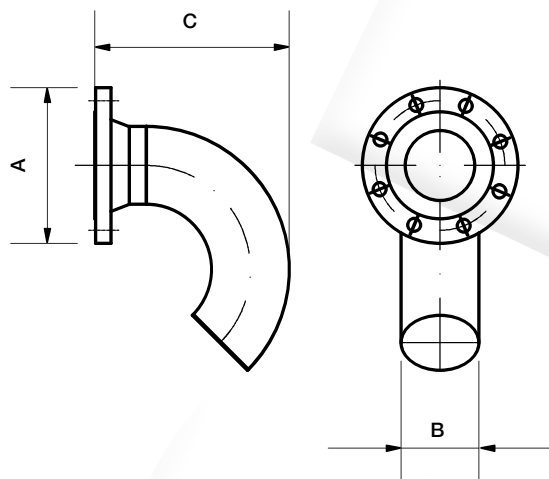
Foam pourers serve the purpose of delivering foam both inside a fixed roof and on top of a floating roof tank. They have a flanged connection fitting our standard line of foam chambers / lances, and an internal stainless steel grid to avoid birds entering the line.

For floating roof we also offer a special pourer with a double outlet which makes it easier to obtain a full coverage in the roof rim, and this within shorter times, shown at the page bottom.

### Materials

B31 - AISI 316 L stainless steel

T1 - Brass

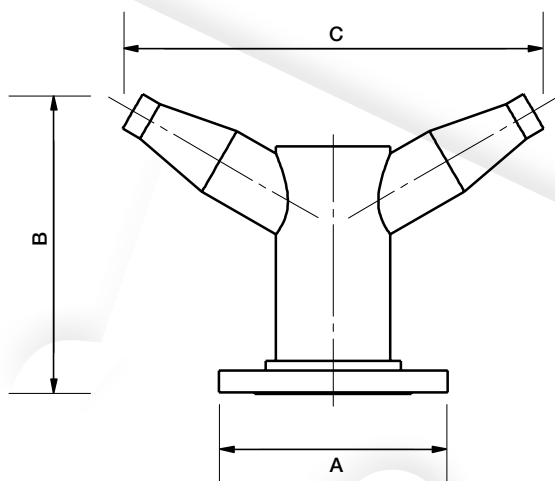


USB-B



### Standard design

Code	A inches	B inches	C mm	W kg
USB B020 A1KE	3"	3"	230	7
USB B040 A1LE	4"	4"	287	14
USB B080 A1ME	6"	6"	402	26
USB B150 A1PE	8"	8"	518	54
USB B200 A1PE	10"	10"	620	77



USB-C



### Bidirectional design

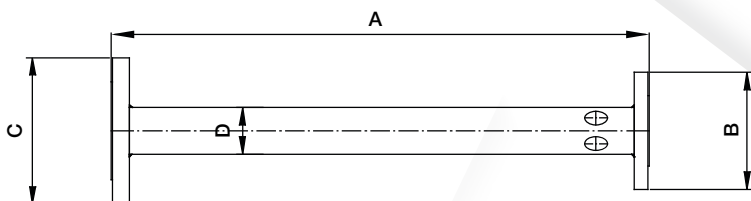
Code	A inches	B mm	C mm	W kg
USB C020 A1KE	4"	300	420	7
USB C040 A1LE	6"	300	485	14

### Coding for options

ANSI 150 – A195 flanges

USB C020 A1KF (Replace last letter with F)

### Low expansion foam branchpipe mod. LBE



#### Technical characteristics

<b>Body</b>	Carbon Steel - AISI 304 / AISI 316
<b>Inlet</b>	Flanged ANSI 150 RF or UNI - DIN
<b>Flange material</b>	ASTM A 105 - AISI 304 / AISI 316
<b>Working pressure</b>	5 bar
<b>Painting</b>	1 coat of epoxy primer and 2 coats of polyurethanic enamel RAL 3000 in the carbon steel version
<b>Stainless steel version</b>	Brushed surface finish

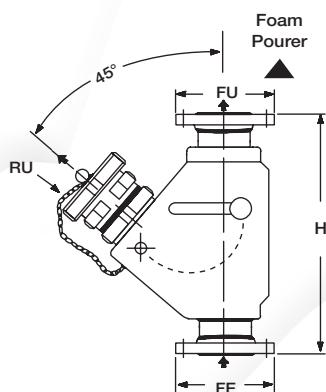
Code	Flow litres	A mm	B inches	C inches	D inches	Weigth kg
LBE2	200	700	2"	3"	2"	12
LBE4	400	700	2"	4"	2"	12
LBE6	600	700	3"	4"	3"	18
LBE8	800	700	3"	4"	3"	18
LBE10	1000	1000	3"	4"	3"	18
LBE15	1500	1000	4"	6"	4"	33
LBE30	3000	1000	6"	8"	6"	38

### Test valve USB-F

The USB-F test valves have been designed designed to be assembled in the foam line ascending to the tank roof, just before the foam maker, and to allow for easy testing procedures. The valve can be set to divert the foam from the line while testing the system, and prevents foam from being poured onto or inside the tank.

#### Materials

<b>Body</b>	T1 - Brass
<b>Flanges</b>	A1 - Carbon steel



Code	Mod.	FE inches	FU inches	RU mm	Weigth kg
USB F080 A1X	VDS 080	3"	3"	70	380
USB F100 A1X	VDS 100	4"	4"	70	380
USB F150 A1X	VDS 150	6"	6"	70	380

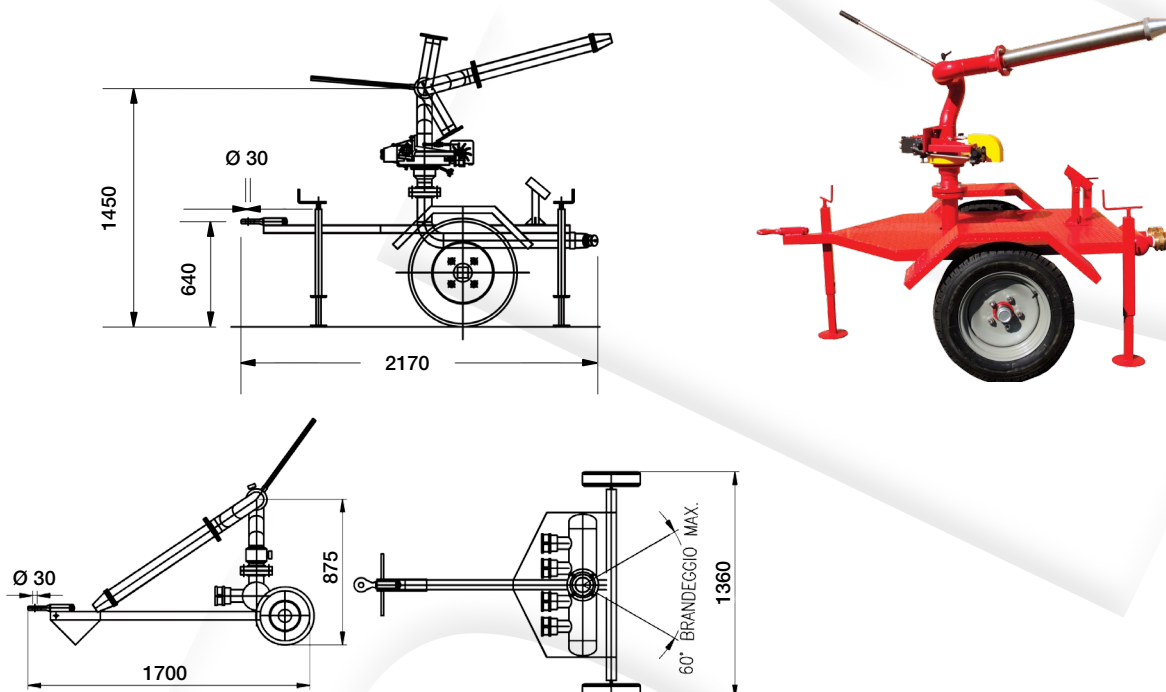
#### Flange type coding

Foam chambers and foam makers are normally supplied fitted with Ansi Flangess, other standards on request. Listed codes show Ansi Flangess, for DIN / UNI Flangess please replace the final B B with an A.

*Example:*

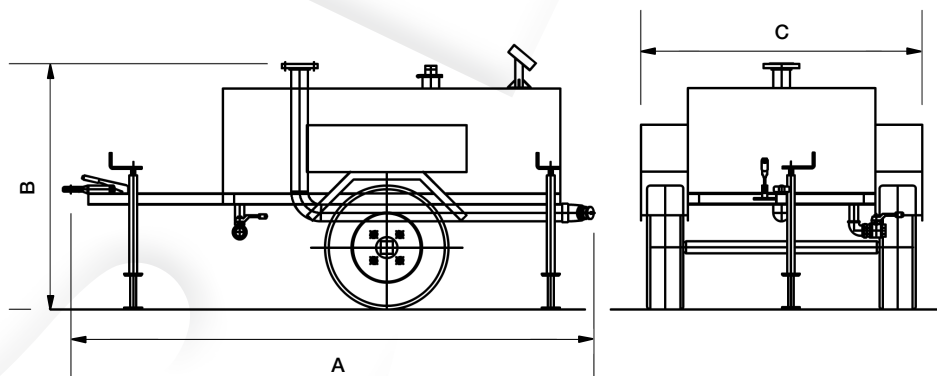
USB F080 A1A flanges Ansi  
USB F080 A1B flanges DIN

Mobile monitors mounted on trailers, with or without foam tanks, can be used in several instances within oil refineries or hydrocarbons depots. SDM manufactures two types of trailers, both of them with the following specifications  
Full rubber wheels for max speed 25 kmh.



## Monitor trailer with on board foam tank (1000 liters)

The above said trailers are shown in their general design, and detailed specification sheets are available from our offices upon request.



Code	Foam tank capacity litres	A mm	B mm	C mm	W* kg
TYK 020A A1KE	500	2500	1100	1500	600
TYK 040A A1LE	1000	2820	1310	1500	680

\* Weight value is meant for empty car



FULL CONE SPRAY NOZZLES

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FLAT FAN JET SPRAY NOZZLES

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OPEN SPRINKLERS

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SPECIAL NOZZLES

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SPIRAL NOZZLES

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WATERMIST NOZZLES

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## WATER SPRAY NOZZLES

### Full cone spray nozzles



AA series full cone nozzle are designed to offer the best spray coverage distribution thanks to their slotted vane, which means the spray covers the area to be protected with a very uniform spray.

For fire fighting applications these nozzles are manufactured normally in brass, while different materials can be quoted upon request.

The performance table below gives the capacity code and the capacity values in lpm at different pressure values, while the spray angle is identified by the nozzle type code as shown, e.g.:

AAQ 2155 T1 > Spray angle **60°** (AAQ)

Capacity code 2155

Material: Brass (T1)

AAU 2155 T1 > Spray angle **90°** (AAU)

Capacity code 2155

Material: Brass (T1)

AAW 2155 T1 > Spray angle **120°** (AAW)

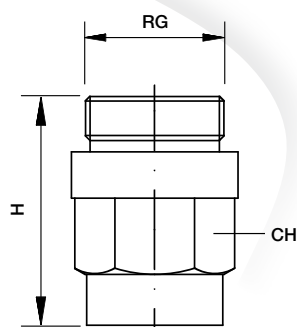
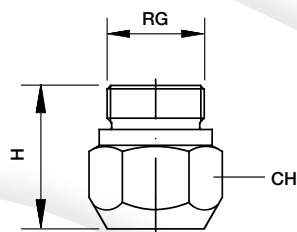
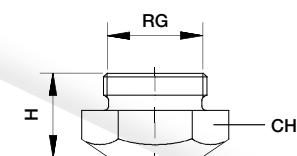
Capacity code 2155

Material: Brass (T1)

#### Materials

B31 - AISI 316 L stainless steel

T1 - Brass



#### Full cone nozzles

AAQ 60°	AAU 90°	AAW 120°	Code	RG inches	Capacity Lpm at pressure (bar)					CH mm	H mm	OD mm
					1	3	5	7	10			
*	*	*	2155 T1	1/2"	9.0	15.5	20.0	24.0	28.3	24	27	4.4
*	*	*	2200 T1		11.5	20.0	25.0	30.0	36.5			5.3
*	*	*	2250 T1		14.0	25.0	32.0	37.0	45.6			6.3
*	*	*	2310 T1	3/4"	18.0	31.0	40.0	47.0	56.6	32	28	6.5
*	*	*	2390 T1		22.5	39.0	50.0	59.0	71.2			6.9
*	*	*	2490 T1		28.0	49.0	63.0	75.0	89.5			8.0
	*	*	2610 T1	1"	35.0	61.0	80.0	95.0	111	40	28	9.0
	*	*	2780 T1		45.0	78.0	100	120	142			10.5
	*	*	3123 T1	1-1/4"	70.0	123	160	190	225	50	30	12.5
	*	*	3194 T1	1-1/2"	112	194	250	295	354	60	35	16.0
	*	*	3240 T1		142	240	316	370	438			18.0
	*	*	3310 T1	2"	180	310	400	474	566	75	44	20.0
	*	*	3490 T1	2-1/2"	280	490	630	750	895	90	52	25.0

## WATER SPRAY NOZZLES

## Full cone spray nozzles



BG series full cone nozzle are designed to offer the best resistance against clogging thanks to their x-shaped vane, which means added system reliability when the piping may contain foreign particles.

For fire fighting applications these nozzles are manufactured normally in brass, while different materials can be quoted upon request, e.g. nickel plated brass or several grades of stainless steel.

The performance table below gives the capacity code and the capacity values in lpm at different pressure values, while the spray angle is identified by the nozzle type code as shown, e.g.

The nozzle code specifies the performance:

BGQ 2185 T1 > Spray angle **60°** (BGQ)

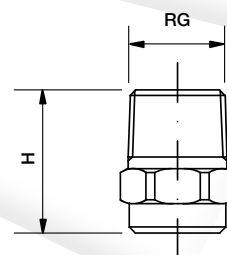
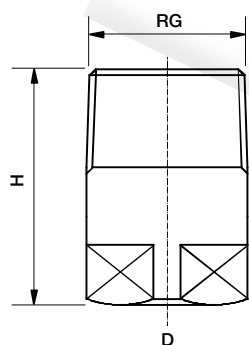
Capacity 2185

Material: Brass (T1)

BGW 2220 T1 > Spray angle **120°** (BGW)

Capacity 2220

Material: Brass (T1)



## Standard spray angle

BGQ 60°	Code	RG inches	Capacity Lpm at pressure (bar)					D mm	H mm	W kg
			1*	3	5	7	10			
*	2185 T1	½"	10.7	18.5	23.9	28.3	33.8	21	33	0.04
*	2300 T1		17.3	30.0	38.7	45.8	54.8			
*	2220 T1	¾"	12.7	22.0	28.4	33.6	40.2	27	40	0.10
*	2350 T1		20.2	35.0	45.2	53.5	63.9			
*	2610 T1	1"	35.2	61.0	78.8	93.2	111	33	52	0.20
*	2370 T1		21.4	37.0	47.8	56.5	67.6			
	2610 T1		35.2	61.0	78.8	93.2	111			
	2870 T1		50.2	87.0	112	133	159			
	3104 T1		60.0	104	134	159	190			

## Wide spray angle

BGW 120°	Code	RG inches	Capacity Lpm at pressure (bar)					D mm	H mm	W kg
			1*	3	5	7	10			
*	2220 T1	½"	12.7	22.0	28.4	33.6	40.2	21	33	0.04
*	2250 T1		14.4	25.0	32.3	38.2	45.6			
*	2290 T1		16.7	29.0	37.4	44.3	52.9			
*	2320 T1		18.5	32.0	41.3	48.9	58.4			
*	2360 T1	¾"	20.8	36.0	46.5	55.0	65.7	27	40	0.10
*	2500 T1		28.9	50.0	64.5	76.4	91.3			
	2920 T1	1"	53.1	92.0	119	141	168	33	52	0.20

\* Capacity at 1 bar = K factor

For higher capacities please enquiry about our nozzle type BE with female thread

## Materials

T1 - Brass

B31 - AISI 316 stainless

## WATER SPRAY NOZZLES

### Flat fan jet spray nozzles



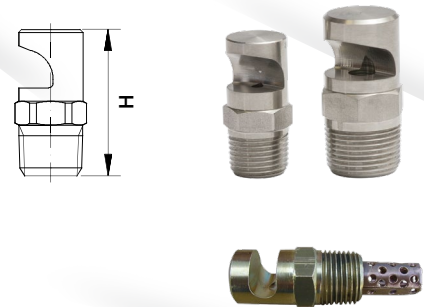
K series nozzles produce a flat fan jet spray with a large or very large spray angle, and are typically used to cover large area surfaces. They are available in two different types e.g.:

#### K-W

The jet is leaving the nozzle with a 15° deflected spray, while the spray angle is about 120°, where the typical application is cooling the outside surface of hydrocarbon tanks.

K nozzles are normally available in brass, while nickel plated brass or other materials are available upon request, and are produced with a tapered BSPT thread to allow for proper jet orientation.

Additional options like NPT thread and copper filter are listed at the page bottom with the proper coding.

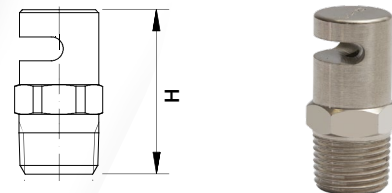


#### 15° Deflected spray

1/2 KDW	3/4 KEW	Orifice dia mm	Capacity Lpm at pressure (bar)					W kg	Sprary angle at pressure 4 bar
			1*	3	5	7	10		
1780 T1	--	2.6	4.50	7.8	10.1	11.9	14.2	0.11	140°
2117 T1	--	3.3	6.75	11.7	15.1	17.9	21.4	(1/2)	130°
2157 T1	--	3.8	9.06	15.7	20.3	24.0	28.7		130°
2188 T1	--	4.1	10.9	18.8	24.3	28.7	34.3		142°
2270 T1	2270 T1	5.0	15.6	27.0	35.0	41.2	49.3	0.40	128°
2310 T1	2310 T1	5.3	17.9	31.0	40.0	47.4	56.6	(3/4)	135°
2390 T1	2390 T1	6.0	22.5	39.0	50.3	59.6	71.2		140°
2470 T1	2470 T1	6.5	27.1	47.0	60.7	71.8	85.8		140°
2550 T1	2550 T1	7.1	31.8	55.0	71.0	84.0	100		140°
--	2700 T1	8.0	40.4	70	90.4	107	128		140°
--	2940 T1	9.3	54.3	94	121	144	172		150°
--	3110 T1	10.3	63.5	110	142	168	201		145°
--	3110 T1	12.2	94.7	164	212	251	299		145°

#### K-X

The jet is leaving the nozzle without deflection, while the spray angle is normally larger than 150°, where the typical application is making up a water wall to contain fire smokes.



#### Not Deflected spray

1/2 KDX	3/4 KEX	Orifice dia mm	Capacity Lpm at pressure (bar)					W kg	Sprary angle at 4 bar
			1*	3	5	7	10		
1780 T1	--	2.6	4.50	7.8	10.1	11.9	14.2	0.11	160°
2117 T1	--	3.3	6.75	11.7	15.1	17.9	21.4	(1/2)	165°
2157 T1	--	3.8	9.06	15.7	20.3	24.0	28.7		170°
2188 T1	--	4.1	10.9	18.8	24.3	28.7	34.3		170°
2270 T1	2270 T1	5.0	15.6	27.0	35.0	41.2	49.3	0.40	168°
2310 T1	2310 T1	5.3	17.9	31.0	40.0	47.4	56.6	(3/4)	172°
2390 T1	2390 T1	6.0	22.5	39.0	50.3	59.6	71.2		172°
2470 T1	2470 T1	6.5	27.1	47.0	60.7	71.8	85.8		168°
2550 T1	2550 T1	7.1	31.8	55.0	71.0	84.0	100		172°
--	2700 T1	8.0	40.4	70	90.4	107	128		170°
--	2940 T1	9.3	54.3	94	121	144	172		170°
--	3110 T1	10.3	63.5	110	142	168	201		170°
--	3110 T1	12.2	94.7	164	212	251	299		170°

\* Capacity at 1 bar = K factor

#### Materials

B31 - AISI stainless 316L

T1 - Brass

## WATER SPRAY NOZZLES

### Open sprinklers



RJ series sprinkler nozzles have been designed to perform fire fighting operations when used in fixed spray systems. They produce a directional spray with a conical shape, the spray being made up of medium velocity drops, and are used to protect surfaces of all geometries, avoiding temperature rise and structural damages.

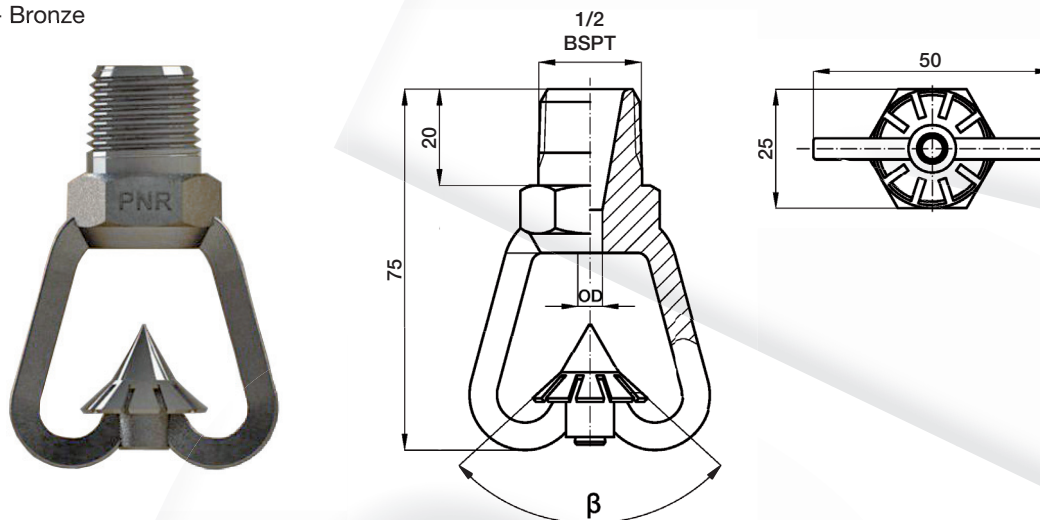
These nozzles can be equipped with different orifice plugs in order to avoid any clogging problem caused by dust, foreign particles or insects.

All RJ type sprinklers are supplied as standard with 1/2 NPT male thread.

#### Materials

B31 - AISI 316L stainless steel

T5 - Bronze



#### Product coding

RJ sprinklers range includes 7 capacity values, each one available with 8 different spray angles.

The two tables underneath give (Table 1) the capacity code of each single nozzle for different pressure values and (Table 2) the nozzle code for different spray angles.

Please note the following:

1. The complete nozzle code is made up by three parts, eg RJT – for spray angle identification 2748 – for capacity value T5 – for material, in this case bronze
2. Therefore a complete nozzle code would look as follows: RJT 2748 T5

**Table 1**

Capacity Code	Capacity Lpm at pressure (bar)					OD mm
	1*	3	5	7	10	
2300 T5SB	17.3	30.0	38.7	45.8	54.7	5.16
2449 T5SB	25.9	44.9	57.9	68.5	81.9	6.35
2573 T5SB	33.1	57.3	74.0	87.6	105	7.14
2748 T5SB	43.2	74.8	96.6	114	137	8.33
3102 T5SB	59.0	102	132	156	187	9.53
3140 T5SB	80.6	140	180	213	255	11.1
3180 T5SB	104	180	232	274	328	12.7

\* Capacity at 1 bar equals K factor

**Table 2**

Nozzle code for spray angle	Spray angle value $\beta$
RJR	65 °
RJT	80 °
RJV	95 °
RJJ	110 °
RJW	125 °
RJY	140 °
RJX	160 °
RJZ	180 °

RJ nozzles carry an UL listing.



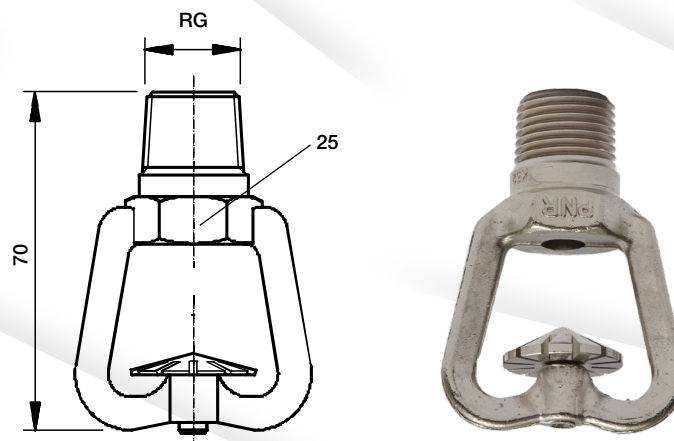
RO series sprinkler nozzles produce a full jet spray whose angle can reach very large values, which allows for cooling operations onto very large surfaces.

The same nozzle body can be supplied with both an 1/2" and a 3/4" tapered BSPT thread, while NPT threads are available as an option, as well as copper or stainless inlet filters (see bottom of page for appropriate coding).

### Materials

B31 - AISI 316 L stainless steel

T1 - Brass



### Thread 1/2"

Code	Capacity Lpm at pressure (bar)					OD mm
	1*	3	5	7	10	
ROY 2156 T1SB	9.00	15.6	20.0	24.0	29.0	4.0
ROY 2198 T1SB	11.5	19.8	25.0	30.0	36.0	4.5
ROY 2270 T1SB	15.8	27.0	35.0	42.0	50.0	5.0
ROY 2300 T1SB	18.0	30.0	40.0	48.0	57.0	5.5
ROY 2390 T1SB	23.0	39.0	50.0	60.0	71.0	6.0
ROY 2470 T1SB	27.0	47.0	61.0	72.0	86.0	6.5
ROY 2550 T1SB	31.0	55.0	72.0	84.0	91.0	7.0
ROY 2700 T1SB	41.0	70.0	92.0	112	130	8.0
ROY 2910 T1SB	52.0	91.0	117	140	165	9.0
ROY 3110 T1SB	64.0	110	139	165	200	10.0

\* Capacity at 1 Bar in liters per minute equals K factor

### Thread 3/4"

Code	Capacity Lpm at pressure (bar)					OD mm
	1*	3	5	7	10	
ROY 2157 T1SB	9.00	15.6	20.0	24.0	29.0	4.00
ROY 2199 T1SB	11.5	19.8	25.0	30.0	36.0	4.50
ROY 2271 T1SB	15.8	27.0	35.0	42.0	50.0	5.00
ROY 2301 T1SB	18.0	30.0	40.0	48.0	57.0	5.50
ROY 2391 T1SB	23.0	39.0	50.0	60.0	71.0	6.00
ROY 2471 T1SB	27.0	47.0	61.0	72.0	86.0	6.50
ROY 2551 T1SB	31.0	55.0	72.0	84.0	91.0	7.00
ROY 2701 T1SB	41.0	70.0	92.0	112	130	8.00
ROY 2911 T1SB	52.0	91.0	117	140	165	9.00
ROY 3111 T1SB	64.0	110	139	165	200	10.0

\* Capacity at 1 Bar in liters per minute equals K factor

### Coding for nozzle options

Adding the following codes at the end of standard codes as shown in the above tables, specifies nozzle options as follows

SN	NPT Thread
FB	Copper filter, BSPT thread
FN	Copper filter, NPT thread
GB	Stainless filter, BSPT thread

**WATER SPRAY NOZZLES****Full cone adjustable nozzles**

Our range of full cone nozzles, series URP, are typically designed to offer design flexibility in fire fighting, applications since offering the advantages of an adjustable flow rate and an adjustable spray angle.

Capacity and spray angle values can be easily preset both at the factory, or right on the installation site.

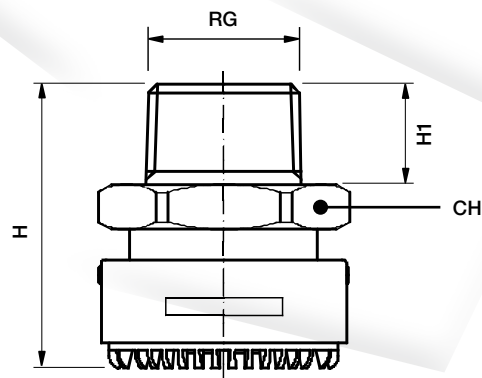
The wide internal passages allow foreign particles up to 1/8 to be in the feed water, while larger particles must be dealt with by means of a filter or screen on the feed line.

**Materials**

T1 - Brass

T5 - Bronze

V1 - Aluminum



Code	RG inches	Capacity Lpm at pressure (bar)					CH mm	H* mm	H1 mm	OD mm
		1**	3	5	7	10				
URP E070 T1FN	¾"	14.4	24.9	32.1	37.8	45.4	30	45	14	34
URP E071 T1FN		28.7	49.8	64.2	75.6	90.8				
URP E072 T1FN		43.1	74.6	96.3	113	136				
URP H100 T1FN	1"	57.5	99.5	128	151	182	50	70	22	54
URP H102 T1FN		136	236	304	359	430				
URP H103 T1FN		180	311	401	472	568				
URP H150 T1FN	1+ ½"	180	311	401	472	568	50	73	25	54
URP H151 T1FN		251	435	562	661	795				
URP H152 T1FN		359	622	803	945	1135				

\* Height dimension for fully extended nozzle - \*\* Capacity at 1 bar = K factor - + Capacity values in the table shows typical settings for each size

**Swivel joints**

Swivel joints are designed to accommodate larger size nozzles. The orientation of the unit is fixed by tightening the clamping flanges with bolts. The connection to the feedline is a male thread, while the connection to the nozzle can be male or female.

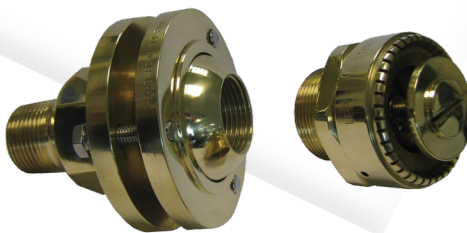
**Max operative pressure**

LP 9 bar

**Materials**

B3 - Stainless Steel AISI 316

T1 - Brass



Code	RG inches	RG1 inches	RF inches	L mm	D mm	A degrees	W kg
ZRQ 8080 xx	1"		1"	89	92	40	1.8
ZRQ 8282 xx	1 ¼"		1 ¼"	130			2.1
ZRQ 8482 xx	1 ½"		1 ¼"	133			2.4
ZRR 8282 xx	1 ¼"	1 ¼"		130	92	40	2.2
ZRR 8284 xx	1 ½"	1 ¼"		130			2.2
ZRR 8484 xx	1 ½"	1 ½"		130			2.4
ZRR 8686 xx	2"	2 ½"		203	158	40	8.0
ZRR 8888 xx	2 ½"	2 ½"		229			8.0

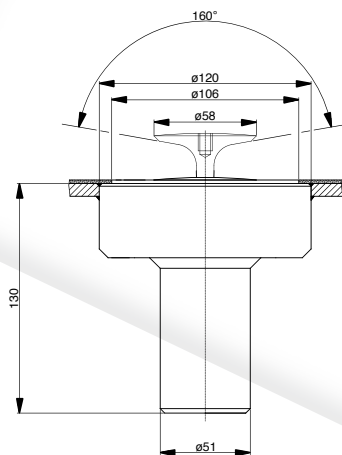
**Order code**

To have a precise identification of required product, the order code must be completed with this code:

ZRQ 8080 T1 (brass)

## Pop-up nozzles

The UMM pop-up nozzles, for cooling and foam-water fire extinguishing system, is specially designed to be fully recessed, which is a key advantage for installation on aircraft carrier's flight deck or other areas that needs surface protection. This nozzle has been tested for assuring operation after being exposed to a jet engine discharge gases for fifteen minutes. Inlet water connection: 1 ¼" gas thread.



### Technical characteristics

Material	B31 Stainless steel AISI 316L
Operative pressure	6 bar
Flow rate	90 Lpm
Coverage diameter	5.5 meter

### Order code

To have a precise identification of required product, the order code must be completed with this code:

UMM x116 B31	<b>X</b>	<b>B</b> > Coverage angle 160°
		<b>D</b> > Coverage angle 360°

## Mushroom nozzles

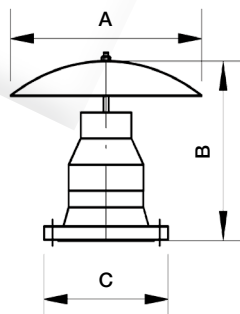
The mushroom type nozzle in the URC series are designed for protection of large size tanks, in oil and petrochemical plants.

Their sturdy construction and large size passages can assure for a very high degree of reliability.

Connection can be either by means of thread, or with flanges according to the most popular standards.

### Materials

A1 - Mild steel, epoxy painted
B31 - AISI 316 stainless steel



Code	Flow min At 5 bar	Flow max At 5 bar	A mm	B mm	C inches	Weight kg
URC-M001	200	400	235	180	1½"	3.5
URC-M002	400	650	235	200	2"	5.5
URC-M003	800	1500	235	210	3"	7.5
URC-M004	1500	3200	400	285	4"	14
URC-M006	3200	5500	400	335	6"	20

## WATER SPRAY NOZZLES

## Full cone spiral nozzles



E type spiral nozzles have been designed to offer a very high resistance to clogging dangers, and at the same time an effective spray distribution for the purpose of performing efficient cooling processes.

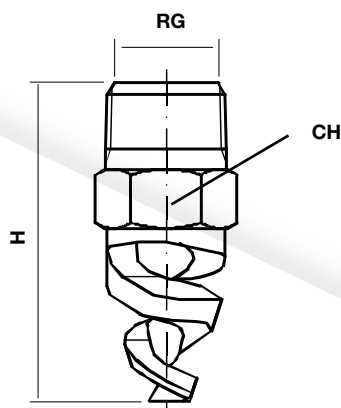
Their design, in fact, does not require an inside swirl component so that the internal liquid passage is totally free, and the jet spray angle value varies very little even with sensible feed pressure changes.

In addition, thanks to their design, the feed pipe size required is consistently smaller than the one required by conventional swirl nozzles, with the advantages of lower weight and cost.

**Materials**

B31 - AISI 316L stainless steel

T1 - Brass



	Code	RG	DO	DM	Capacity Lpm at pressure (bar)				CH	H
		inches	mm	mm	1*	3	5	7	mm	mm
90°	ECU 2230 T1SB	3/8"	4,8	3,2	13,6	23,5	30,3	42,8	19	48
	ECU 2317 T1SB		5,6		18,3	31,2	40,9	57,8		
	ECU 2410 T1SB		6,4		24,0	41,5	53,6	75,8		
	ECU 2640 T1SB		7,9		37,7	64,6	83,0	117		
	EDU 2940 T1SB	1/2"	9,5	4,7	54,5	94,4	122	172	22	64
	EDU 3128 T1SB		11,1		74,5	129	166	235		
	EEU 3165 T1SB	3/4"	12,7	4,7	92,0	165	213	301	27	70
	EFU 3260 T1SB	1"	15,9	6,3	152	253	339	479	34	92
	EFU 3372 T1SB		19,0		215	372	480	679		
120°	ECW 2156 T1SB	3/8"	4,0	3,2	9,0	15,6	20,1	28,4	19	48
	ECW 2230 T1SB		4,8		13,5	23,5	30,3	42,8		
	ECW 2317 T1SB		5,6		18,3	31,7	40,9	57,8		
	ECW 2410 T1SB		6,4		24,0	41,5	53,6	75,8		
	ECW 2640 T1SB		7,9		37,0	64,6	83,0	117		
	EDW 2940 T1SB	1/2"	9,5	4,7	54,5	94,4	122	172	22	64
	EDW 3104 T1SB		10,5		60,0	104	134	190		
	EDW 3128 T1SB		11,1		74,5	129	166	235		
	EEW 3165 T1SB	3/4"	12,7	4,7	92,0	165	213	301	27	70
	EFW 3260 T1SB	1"	15,9	6,3	152	263	339	479	34	92
	EFW 3372 T1SB		19,0		215	372	480	379		

\* Capacity at 1 bar = K factor



Watermist nozzles are the newest development in fire fighting from recent years. After having been developed for fire protection systems on ship cabins for crew/passenger their specific advantages have shown to be extremely useful in a growing number of traditional ground applications.

In addition, the small dimensions of the nozzles and the limited quantities of water required have made possible interesting applications in new fields.

The watermist principle is relatively simple, and it is based on the physical law that a fire cannot survive in an atmosphere where the oxygen percentage is lower than 11%.

Based on this, in every closed ambient, it is enough to evaporate a limited quantity of water and therefore introduce in the atmosphere enough steam to lower the oxygen percentage below the above said threshold to extinguish the fire.

It is then clear that a watermist system will not work in any application in any open application.

Therefore a watermist system offers a number of noticeable advantages when compared to a classic sprinkler system

- Obtain a very quick action, since the fire stops in very short times when the Oxygen percentage is reduced.
- Avoid the heating of wall surfaces through convection and irradiation therefore a slow down in fire extension
- Extract from the atmosphere the evaporation heat of water, therefore cooling the ambient. 2
- Require smaller pipe dimensions
- Require smaller waterstocking tanks
- The mist floating in the air, last but not least, will make it easier for any person finding themselves in the ambient to breathe.

Even considering that watermist systems are not to be used in open spaces, where wind would diminish or eliminate their efficiency, it is possible to list a number of applications which are ideally suited for this technique:

- Cable tunnels in power plants
- Turbine casing in power plants
- Biblioteques and archives
- Floating floors in computer rooms
- Engine compartment in truck or buses
- Frying pans in industrial kitchens
- Passenger areas in trains or subway

Normally the watermist principle requires a quick evaporation of the droplets injected into the ambient, which means that a watermist nozzles should produce rather small droplets, whose D32 diameter is lower than 150 microns.

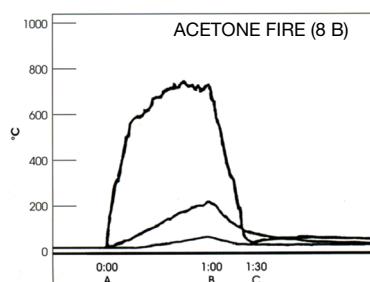
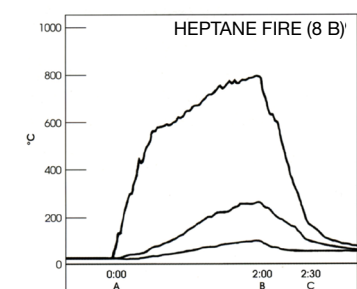
D32 is a technical parameter which gives the dimension of that drop whose surface/volume ratio is the same of the average value calculated on all the drops in the sample under examination.

This parameter is typically used when examining an evaporation process.

The most practical way of producing small droplets is by means of a pressure nozzle fed with high pressure water, therefore watermist systems are usually powered by high pressure pumps or high pressure gas bottles.

Both principles allow for the design of compact/portable systems, with limited dimensions and weight.

A recent development also shows that, under given conditions, the watermist concept can be used at relatively low pressures with effective results.



In this page two diagrams showing the temperature graph in a test performed at low pressure (30 bar), some years ago when PNR started to investigate this technology.

Since many years PNR, directly and through one of the companies in the Flowtech group is among the world leaders for the production of systems for evaporative cooling, and in recent years we have developed high technology systems for air cooling and fogging processes for gas turbines.

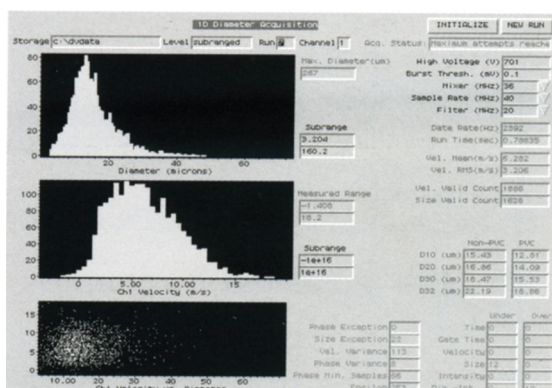
All the above systems are based on the know-how required to use the evaporation of tiny drops

And produce the high precision nozzles required henceforth.

PNR is active since 15 years on research and application for watermist nozzles, and has designed several nozzles upon request of some important customers, one of which having obtained an IMO approval.

Our experience has allowed to define and produce, in addition to special nozzles, our own standard range of watermist nozzles..

We make available to our customers both standard nozzles and special ones, designed to fill specific needs, manufactured exclusively, under strict confidential agreements, for single customers and branded with their names.



Our laboratories are equipped with state of the art instruments, including a laser interferometer which allows examination of drops diameter and report of several data like droplet size spectrum and droplet velocity diagrams.

We can then deliver to our customers nozzles with certified performances.



The first watermist nozzles offered on the market were nothing else than multiple full cone nozzles, a design known since decades in Europe and used primarily for gas and smoke washing.

These nozzles consist in a main body housing a number of cavities, each one of them being the whirling chamber of an hollow cone nozzle and each one provided with an outlet orifice.

By assembling into each cavity a whirl-insert one obtains a multiple nozzle, which produces a full cone spray by interaction of several hollow cone nozzles arranged on a circle onto the main body.

All nozzle engineers know the dimensional relation between orifice and droplet dimension, which says that a smaller nozzle makes a smaller drop, these nozzles where very popular since a small

droplet spray could easily be produced with a low pressure water supply, e.g. 3 bar.

The step to obtain a watermist nozzle consisted then into feeding these nozzles with higher pressures, since higher exit velocities from the orifice contributed to even smaller droplets.

Such nozzles, completed with an inlet filter, and when necessary with a temperature activated glass bulb, are the vast majority of the watermist nozzles today on the market.

Of course some design modifications have been made to adapt the nozzles to the required specifications in term of jet penetration, throw distance and volume filling.

### Research on new nozzle design



In addition to produce watermist nozzles for customers using proprietary design and our standard range of watermist nozzles we continuously run research projects to investigate new designs for more efficient and convenient nozzles.

The project actually under evaluation is a new concept where very small orifices are distributed over an hemispherical surface, onto which any layout of orifices is possible so as to obtain directional sprays in any possible desired direction.

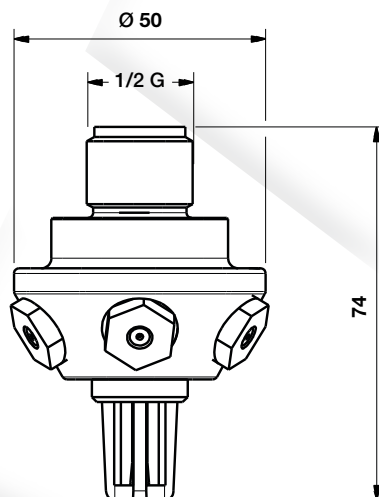
To address this problem a new nozzle has been developed, based onto a well known principle, that is the one based on a straight jet at high speed, which is fractionated by air drag and resistance.

It has been possible to produce such a straight jet with a very small diameter, so that the jet break up happens at a very small distance from the nozzle.

Typical values for this process are jet diameter 0.13 mm and break up length 1.5 meters.

The microscope picture shows one of these tiny orifices,

## CJ TYPE NOZZLES



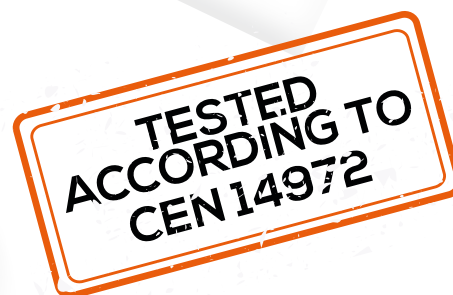
CJ type nozzles feature a classic multiple orifice construction, with a series of nozzles arranged on a circle over a single body. This design allows for a wide spray angle range, from about 180° to lower values. The single micro nozzles are fitted with individual inlet filter to protect the small inside passages from the danger of clogging, and with an optional temperature sensitive bulb to activate the spray when the room temperature exceeds the design value.

### Materials

All metal components      B1 - AISI 303 Stainless steel (standard type)  
                                          B31 - AISI 316L Stainless steel  
                                          T8 - Nickel plated brass  
 Actuator seal                ---      Buna

Spray angle	Code	Capacity Lpm at pressure (bar)
		100
180°	★ CJZ A069 B31PG	6,95
	CJZ A100 B31PG	10

\* Tested according to UNICEN TS 14972 norms for OH1 fires



Code creating procedure to order product. Example:

Series	Spray angle	Construction	Flow rate	Material	Positioning	Connection
C J	Z	0	1 2 3	M M	L	B

**Spray angle: Z = 180° (β = 120°)**

### Construction

0 →	without central nozzle	without thermo bulb	
1 →	with central nozzle	without thermo bulb	
A →	without central nozzle	with thermo bulb @ TR = 57°C (135°F)	(bulb JOB F3-XS Orange)
B →	without central nozzle	with thermo bulb @ TR = 68°C (155°F)	(bulb JOB F3-XS Red)
C →	without central nozzle	with thermo bulb @ TR = 79°C (175°F)	(bulb JOB F3-XS Yellow)
D →	without central nozzle	with thermo bulb @ TR = 93°C (200°F)	(bulb JOB F3-XS Green)
E →	without central nozzle	with thermo bulb @ TR = 141°C (286°F)	(bulb JOB F3-XS Blu)
F →	without central nozzle	with thermo bulb @ TR = 182°C (360°F)	(bulb JOB F3-XS Mauve)
G →	without central nozzle	with thermo bulb @ TR = 260°C (500°F)	(bulb JOB F3-XS Black)

### Flow rate :

It indicates flow rate in lpm tenths, reference pressure 100 bar

### Nozzle positioning \*

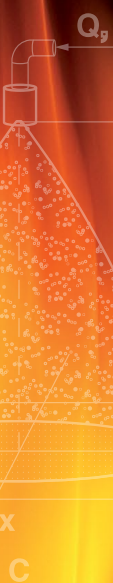
L →opposite (2)    T →triangle (3)    X →cross (4)    P →pentagonal scheme (5)    S →star scheme (6)

\*Note: Only for construction 1, central nozzle must be considered (+1)

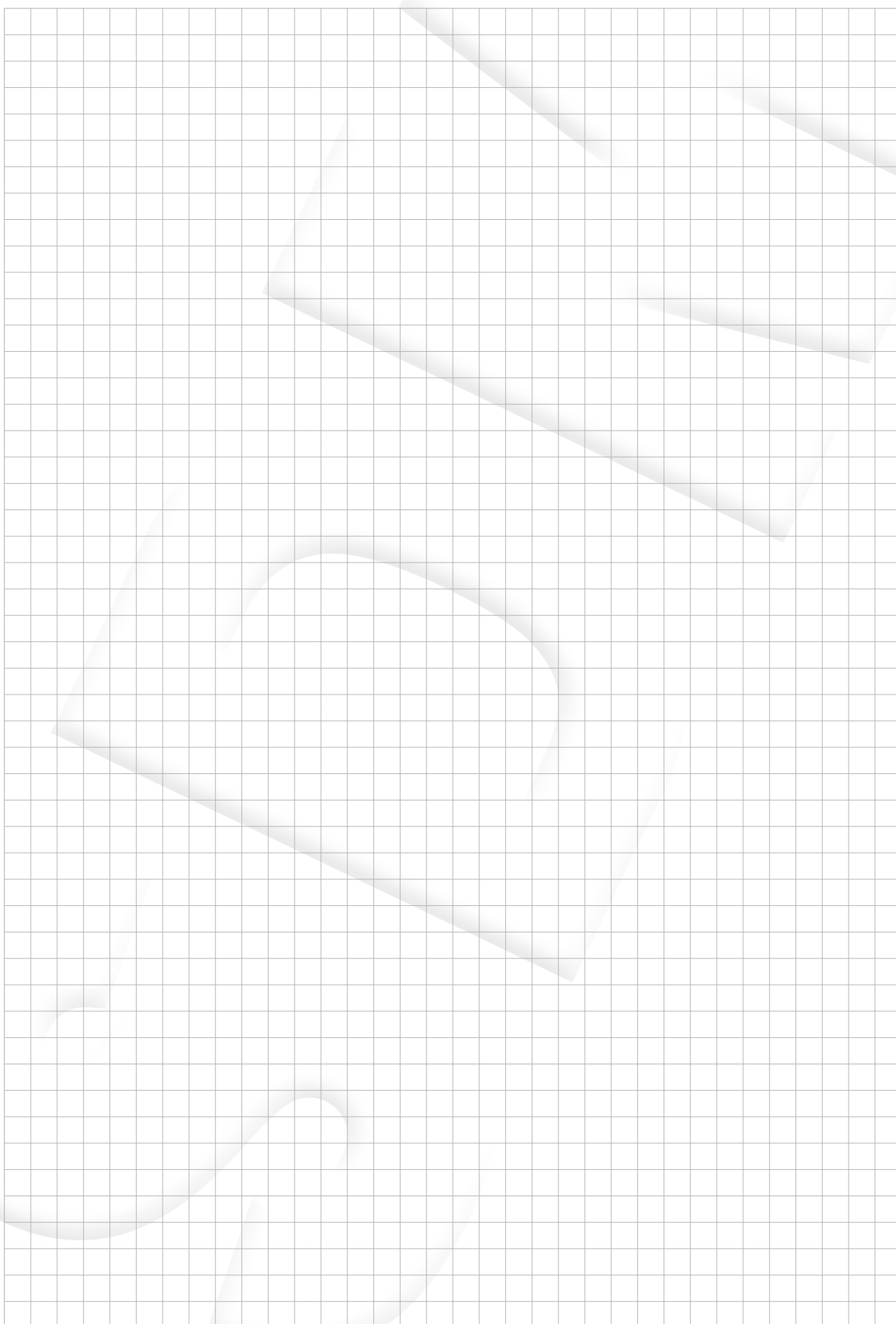
### Connection

B → BSPT male taper thread  
 G → BSPP male parallel thread  
 N → NPT male taper thread

Note: Filters are integrated in each nozzle spray









## PRODUCT WARRANTY

PNR products, if defective in manufacture, marking, labelling or packaging, will be replaced or repaired at the option of PNR and free of charge.

The above warranty conditions will apply if notice of defect is received within 7 days from product installation, or within one year from date of shipment.

Warranty will not apply for products that have been used under improper conditions of pressure and temperature, or spraying liquids with an high content of abrasive solid particles or containing chemicals not compatible with the product material.

PNR reserves the right to examine the products claimed defective in case one of the above mentioned cases are believed to have occurred, and to ask the customer to ship back for examination one or more of the products claimed defective.





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Moreover it is not possible to show in the catalogue pages all technical information about a product, like for example spray distribution charts and droplet size reports.

Should your process require that one or more technical characteristics for a given product are strictly adhered to, you are requested here to contact our offices and obtain the technical information you require, before sending your order.



# CTG FF12 BR

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