

Crystal Fountains

DEFO | Fountain
Products





With over thirty years of experience, CRYSTAL FOUNTAINS[®] INC., manufacturer of **DEFO**[®] water feature products for commercial applications, is a world leader in the design and development of fountain components for the retail, hospitality, entertainment, parks and recreation industries. Architects, engineers and fountain specialists worldwide prefer **DEFO** products for their Quality, Durability and Versatility.

CRYSTAL FOUNTAINS INC. is dedicated to continuous research and development of our **DEFO** product line for optimum performance and capabilities. **DEFO** products are precision manufactured to exacting standards using calibrated instrumentation. Constructed of cast bronze, machined brass and copper, the components are easy to maintain. **DEFO** products are designed to be strong and to withstand cracking, algae and chlorine, as well as exposure to sun, heat, wind and ice.

In keeping with CRYSTAL FOUNTAINS' commitment to technological innovation and service excellence, and our reputation for superior manufacturing, we fully support our **DEFO** water feature products with a limited Ten Year Warranty plan (see inside back cover).

Contents

<p>Basic Requirements For A Quality Fountain Installation</p>		<p>3</p>
<p>Spray Jets</p>		<p>5</p>
<p>Lighting</p>		<p>47</p>
<p>Electrical</p>		<p>61</p>
<p>Drains & Inlets</p>		<p>73</p>
<p>Accessories</p>		<p>85</p>
<p>Engineering Data And Conversion Factors</p>		<p>96</p>

2nd Printing, October, 1999.

The photographs shown in this catalogue are for illustrative purposes only. As such, some of the photographs may not contain Crystal Fountain components.

DEFO and Crystal Fountains are the registered and patented trademarks of Crystal Fountains Inc., a Canadian corporation. Copyright © 1999 Crystal Fountains Inc. All rights reserved.

Crystal Fountains Inc., whose policy is one of continuous improvement, reserves the right to discontinue or change, at any time, specifications, designs or prices in this non-contractual document without incurring any obligations and without prior notice.



Basic Requirements For A Quality Fountain Installation

The following items must be assessed and given consideration for a successful fountain; and will facilitate further discussions with a qualified fountain designer or consultant.



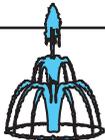
Pool

The size and shape of the pool may be determined by the fountain effects, or the fountain effect may be designed to fit the pool. The water depth should be not less than 18" for easy installation of the equipment.



Pool Filter

Pool filters will maintain water quality. Filter size based on pool capacity must be calculated to enable proper operation of the filter to ensure clear water. Wall mounted 'IEA' filter returns, circulate filtered water to corners of pools or other areas where water does not move.



Fountain Effects

Spray jets should be selected to give the pattern and effect desired. (see page 5)



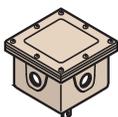
Lighting

A standard of two lights per single nozzle is recommended for proper illumination. The wattage is determined on the size and height of the water effect and whether colour lenses are used. (see page 47)



Pumps

Pumps are selected based on water and pressure requirements for the selected fountain effects. Submersible pumps or dry pumps are available for use on fountains. Dry pumps should be equipped with suction strainers. (see page 91)



Junction Boxes

Waterproof 'EBJ' junction boxes complete with 'EGS' watertight cord and mounted on red brass 'EP' conduits. The type of junction box will be determined by the number of lights and electrical circuits it will service. (see pages 62)



Control Panel

Nema rated electrical panels incorporate the controls for the pumps, lights and water level equipment. Panels also house operating timers, as well as timers and relays for sequencing valves.



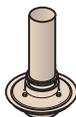
Wind Controller

A sensing head mounted up-wind from the fountain with the control mechanism in the control panel can reduce the height of the fountain jet in moderate winds by opening a by-pass valve or shut down the jets pump completely in heavy winds. (see page 63)



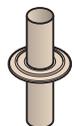
Suction Drains and Debris Screens

Suction drains with debris screens must be provided to prevent damage to pumps and logging of spray jets. (see pages 79)



Overflow Drains

Overflow drains remove excess water brought on by rainfall or accidental overflowing of the fountain.



Sleeve Fittings

Mechanical 'IFS' stub-ups provide watertight sleeves through pools for attachment to spray jets. (see pages 83)



Water Level Controls

Electronic water level sensors monitoring water make up valves and low water shut down will replenish the water lost due to evaporation. (see pages 66) Non electric hydraulic water level controls are also available. (see pages 86)





Spray Jets

ProductPg

NAE	Aerator Jets	6
NBU	Bursting Jets	7
NCA	Cascade Jets	8
NCL	Lake Cascade Jet	9
NDH	Dandelion Hemisphere	10
NDS	Dandelion Sphere	11
NEA	Plume Jets	12
NEF	Plume Jets	13
NES	Clear Stream Jet	14
NFO	Foam Jet	15
NGA	Fan Jets	16
NGB	Fan Jet	17
NGF	Finger Jet	18
NGL	Flat Jets	19
NHC	Hollow Column Jets	20
NIA	Aerator Jets	21
NIC	Funnel Cascade Jet	22
NIL	Foam Jets	22
NLC	Column Jets	24
NLF	Crown Jets	25
NLG	Ground Jets	26
NMB	Mushroom/Bell Jets	27
NMC	Tulip Jets	28
NMF	Bell Jets	29
NMH	Hollow Stream Jets	30
NMP	Picaly Jets	31
NMS	Mini-Spout Jet	32
NPA	Column Pods	33
NPB	Medium Foam Pods	34
NPC	Crown Pods	35
NPD	Mist Column Pod	36
NPF	Large Foam Pods	37
NPW	Large Watercastle Pods	38
NRC	Rain Curtain	39
NSJ	Spray Jewel Jets	40
NSR	Spray Rings	41
NTO	Twirl Jets	42
NWA	Watercastle Jets	43
NWC	Watercastle Jets	44
NWD	Watercastle Jets	45



NAE series

Aerator Jet



Specification:

Construction shall be cast bronze, machined brass and copper. Jet shall have an integral swivel base and DEFO 'Uniloc' rapid air-to-water ratio adjustment collar.

Options:

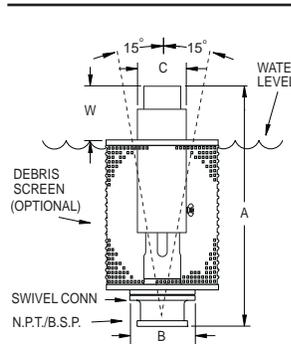
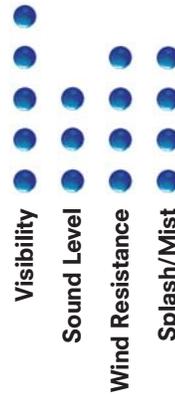
(Add suffix)
 D - debris screen
 Q - chrome plated

Note:

- (for optimum effect)
- 1. Dimension 'W' (nozzle projection above water level) must be maintained.
- 2. A constant unvarying water level is required.
- 3. Use shaded chart section.

Function

A uniform column of fluffy white water, the Aerator Jet ascends to a crest and descends down its own column when vertically mounted. An integral swivel base permits angled installation. The Aerator Jet is unparalleled for viewing when illuminated. **Water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	w dim.	inlet (npt) (bsp)	spray height	3'	5'	8'	10'	15'	20'	30'	35'	40'	50'	60'	80'
NAE-075	.125"	7 ⁵ / ₄ "	2 ¹ / ₄ "	1 ¹ / ₄ "	1 ¹ / ₄ "	3/4"	gpm head spread	5 16'	6 23'	8 39'									
NAE-100	.200"	9 ¹ / ₄ "	2 ¹ / ₂ "	1 ¹ / ₂ "	1 ¹ / ₂ "	1"	gpm head spread	9 16'	10 23'	12 35'									
NAE-125	.250"	11"	3"	1 ³ / ₄ "	2"	1 ¹ / ₄ "	gpm head spread		13 23'	16 42'	17 44'	20 62'							
NAE-150	.325"	13 ¹ / ₄ "	3 ¹ / ₂ "	2 ¹ / ₄ "	2"	1 ¹ / ₂ "	gpm head spread		23 25'	28 32'	29 37'	33 49'	39 65'						
NAE-200	.500"	15 ³ / ₄ "	4 ¹ / ₂ "	3"	2"	2"	gpm head spread			40 28'	47 39'	53 49'	62 65'	65 74'	75 98'	82 129'	91 150'		
NAE-300	.625"	21"	6"	3 ¹ / ₂ "	3"	3"	gpm head spread				117 24'	139 33'	147 42'	170 56'	192 63'	196 74'	209 84'	249 114'	
NAE-400	.750"	25"	8 ³ / ₄ "	4"	3"	4"	gpm head spread						263 37'	287 47'	314 51'	332 58'	380 70'	414 93'	467 116'
NAE-450	.750"	22"	8 ³ / ₄ "	4 ¹ / ₂ "	6"	4"	gpm head spread						343 35'	374 42'	413 51'	461 63'	501 77'	537 88'	624 116'

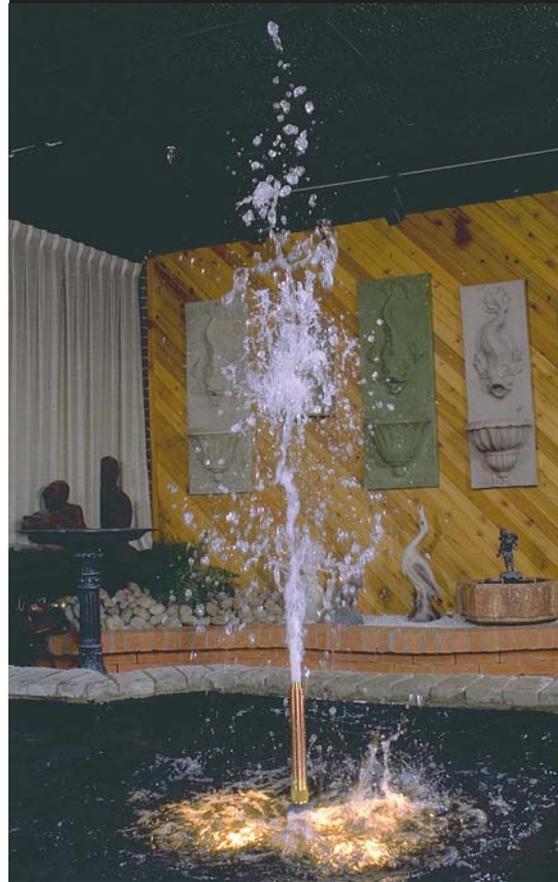
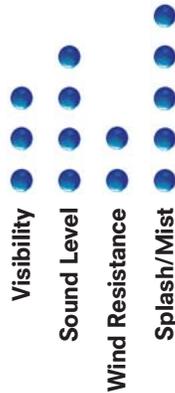


Bursting Jet

NBU series

Function

A fascinating showpiece, the Bursting Jet with its effervescent splashing provides continued interest for the viewer. This jet is best suited for an open area, in a pool with a diameter at least four times the operating height of the jet. **Not water level dependent.**



Specification:

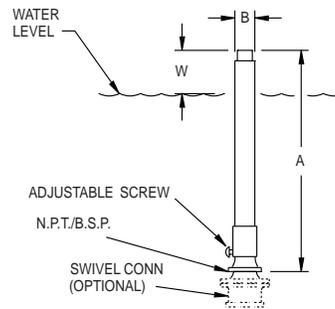
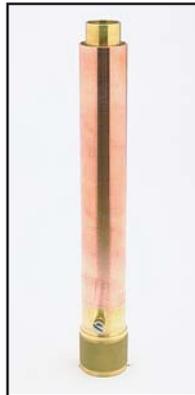
Construction shall be cast bronze, machined brass and copper with DEFO integral burst ratio adjustment screw.

Options:

- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Dimension 'W' (nozzle projection above water level) must be maintained.
- 2. Requires fine screening at pump (see performance chart).
- 3. Requires non-turbulent water supply. Allow 12" (300 mm) straight pipe under jet.
- 4. Use shaded chart section.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim.	inlet (npt) (bsp)	spray height	4'	5'	6'	8'	10'
NBU-050	.063"	5"	7 / 8"	1 1 / 4"	1 / 2"	gpm head spread	3 7'	5 10'	16"		
NBU-075	.063"	8"	1 1 / 8"	2"	3 / 4"	gpm head spread		8 11'	11 12'		
NBU-100	.063"	11"	1 1 / 8"	3 1 / 2"	1"	gpm head spread	13 8'	15 9'	17 11'	18 13'	40"



Lake Cascade Jet

NCL series

Function

A massive eruption of foamy white water for large installations which, the Lake Cascade Jet provides a visual presence of grandeur and beauty. Ideal for lakes and large ponds needing heavy aeration. Adjustable air-to-water ratio sleeve facilitates on-site performance enhancement. **Water level dependent.**



Specification:

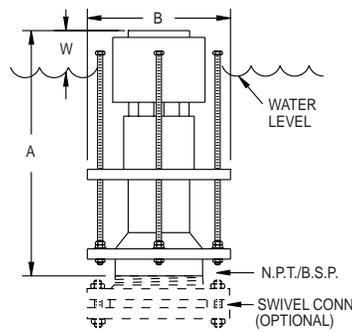
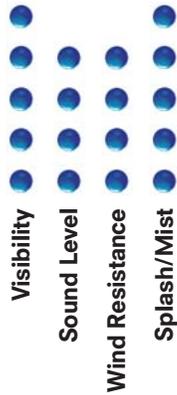
Construction shall be extruded bronze, brass and stainless steel fitted.

Options:

(Add suffix)
S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Dimension 'W' (nozzle projection above water level) must be maintained.
- 2. Install in a vertical condition.
- 3. Spray effect is adjustable for height and density.
- 4. Do not use in small contained areas.
- 5. Use shaded chart section.



Dimensions

Performance

DEFO no.	a dim.	b dim.	w dim.	inlet (npt) (bsp)	spray height	10'	20'	50'	80'	100'
NCL-600	24"	13"	6"	6"	gpm head spread	410 25' n/a	590 50' n/a	925 125' n/a	1200 200' n/a	1300 250' n/a



Dandelion Sphere

NDS series

Function

A pulsating sphere of interconnecting discs of water, the Dandelion Sphere closely resembles a modern sculptured piece when not in use as a water feature. Ideal in enclosed malls, foyers and areas which are free of wind. Breathtaking when illuminated. **Not water level dependent.**

- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist



Specification:

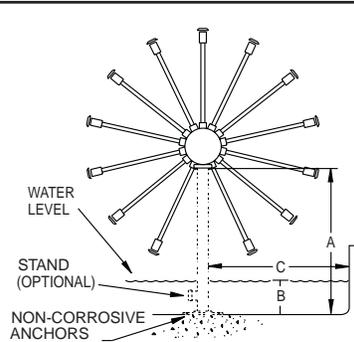
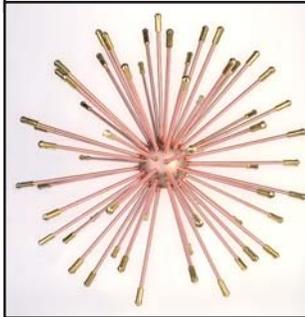
Construction shall be cast bronze, machined brass and copper. DEFO nozzles are easily cleaned, individually adjustable and removable.

Options:

(Add suffix)
 B - stand (provide details)
 Q - chrome plated

Note:

(for optimum effect)
 Requires fine screening at pump 1/6" (.063"/1.5 mm) openings.



Dimensions

Performance

DEFO no.	hub dia.	total dia.	no. arms	inlet (npt) (bsp)	gpm	head	recommended installation		
							A	B	C
NDS-030	8"	36"	29	2"	75	8'	60"	12"	72"
NDS-040	8"	48"	29	2"	75	10'	60"	12"	96"
NDS-045	8"	48"	61	2"	155	12'	72"	12"	96"
NDS-060	10"	72"	61	2"	155	13'	96"	12"	144"
NDS-065	12"	72"	125	3"	317	14'	96"	12"	144"
NDS-080	20"	96"	173	4"	436	16'	120"	12"	192"
NDS-100	20"	120"	253	6" F	634	19'	144"	12"	240"



NEA series

Plume Jet



Function

A long and slender column of water which displays an attractive "rooster tail" in mild winds, the NEA Plume Jet may also be used for vertical effects, angled spray bars and rings. **Not water level dependent.**

Specification:

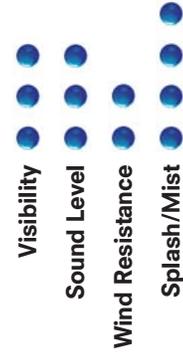
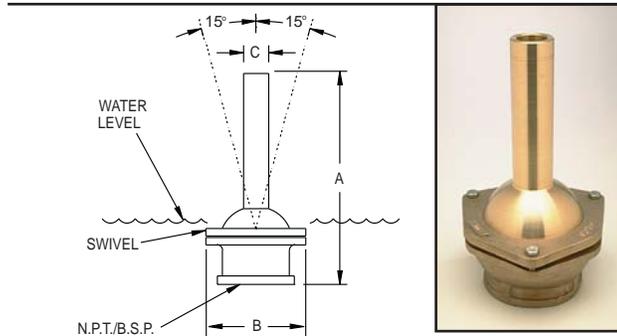
Construction shall be cast bronze and brass with DEFO integral swivel connection.

Options:

(Add suffix)
Q - chrome plated

Note:

- (for optimum effect)
- 1. Requires fine screening at pump. Screen openings should not exceed 50% of dim. 'C'.
- 2. Swivel alignment should not exceed 5°.
- 3. Requires a straight length of pipe to inlet minimum 6X inlet size diameter.
- 4. Use shaded chart section.
- 5. Contact factory for customized bore sizes.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim. (id)	inlet (npt) (bsp)	spray height	5'	10'	15'	20'	30'	40'	50'	60'	70'	80'	90'	100'
NEA-012*	.065"	1 ⁷ / ₈ "	1 ¹ / ₂ "	.125"	1 ¹ / ₈ "	gpm head spread	0.7 8'	1.0 14'										
NEA-025*	.090"	2 ¹ / ₄ "	3 ³ / ₄ "	.187"	1 ¹ / ₄ "	gpm head spread	2.2 8'	2.8 14'	3.3 20'									
NEA-037*	.125"	2 ³ / ₄ "	1"	.250"	3 ³ / ₈ "	gpm head spread	3.6 8'	5.1 14'	6 20'	6.5 27'								
NEA-050*	.190"	3 ¹ / ₂ "	1"	.375"	1 ¹ / ₂ "	gpm head spread	5.0 8'	7.5 14'	10 20'	12.5 27'								
NEA-075	.125"	4"	2 ¹ / ₄ "	.250"	3 ³ / ₄ "	gpm head spread	3 8'	5 15'	6 28'									
NEA-100	.190"	5"	2 ¹ / ₂ "	.375"	1"	gpm head spread	7 8'	9 14'	12 21'	14 44'								
NEA-125	.250"	5 ¹ / ₂ "	3 ³ / ₄ "	.500"	1 ¹ / ₄ "	gpm head spread	11 8"	16 12"	20 19"	25 33'								
NEA-150	.312"	6"	3 ¹ / ₄ "	.625"	1 ¹ / ₂ "	gpm head spread		24 14'	30 24'	37 28'	45 41'							
NEA-200	.435"	7 ¹ / ₂ "	4 ³ / ₈ "	.875"	2"	gpm head spread		45 12"	56 19'	67 26'	86 44'	113 69'	117 74'					
NEA-300	.550"	12 ¹ / ₄ "	6"	1.125"	3"	gpm head spread		79 12"	94 19'	116 27'	137 27'	174 58'	197 79'	230 115'				
NEA-400	.750"	16"	8 ³ / ₄ "	1.5"	4"	gpm head spread				198 n/a	259 n/a	284 n/a	320 n/a	393 n/a	407 n/a	423 n/a	496 n/a	520 n/a

*Small jets for spray rings and spray bars have male N.P.T. threads.



NES series

Clear Stream Jet



Specification:

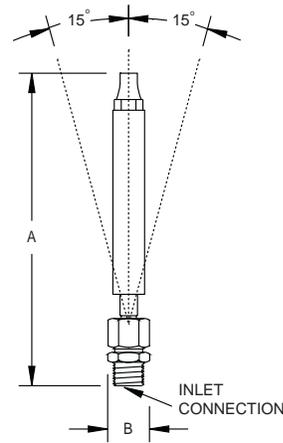
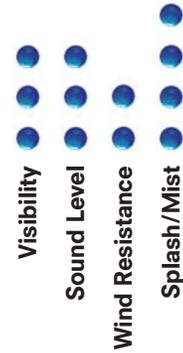
Construction shall be machined brass.

Note:

(for optimum effect)
Angle of adjustment not to exceed 15°

Function

The NES jet provides a clear stream performance and pressure regulation on manifolds and spray rings where uniform output is required. **Not water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	nozzle orifice	a dim.	b dim.	inlet (npt)	spray height	5'	10'	15'
NES-050	.125"	1/4"	7 1/2"	1"	1/2"	gpm head	4 10'	5 19'	6 22'



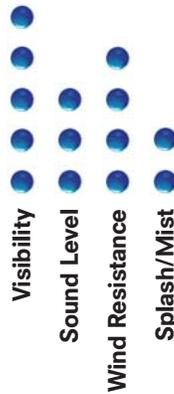
Foam Jet

NFO series

Function

A mound of aerated water at low levels, the Foam Jet becomes a splashy, frothy column at high levels. Ideal for medium-sized and large displays. Provides optimum visual and sound effects.

Water level dependent.



Specification:

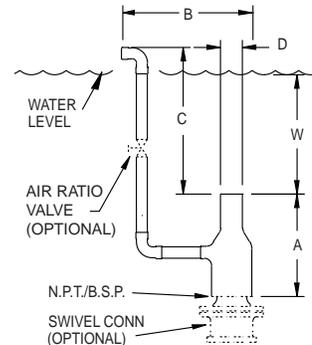
Construction shall be machined cast bronze and copper.

Options:

- (Add suffix)
- A - air ratio valve
 - N - adjustable nozzle sleeve (model NFO-300 only)
 - Q - chrome plated
 - S - DEFO swivel connection (see ASL/ASU series)
 - W - wave suppression device

Note:

- (for optimum effect)
1. Dimension 'W' must be maintained.
 2. A constant unvarying water level is required.
 3. Requires non-turbulent water supply.
 4. Wave suppression device required in small pools or confined areas.
 5. Use shaded chart section.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	d dim.	w dim.	inlet (npt) (bsp)	spray height	1'	2'	3'	4'	5'	6'	8'	10'	15'	20'
NFO-050	.125"	3 ¹ / ₄ "	4 ¹ / ₄ "	3 ¹ / ₂ "	3 ³ / ₄ "	2 ¹ / ₂ "	1 ¹ / ₂ "	gpm head spread	6 8"	7 12"	9 15"							
NFO-075	.187"	3 ¹ / ₂ "	4 ¹ / ₂ "	5"	1"	2 ¹ / ₂ "	3 ³ / ₄ "	gpm head spread	5 6"	14 12"	16 20"	18 24"						
NFO-100	.250"	4 ¹ / ₂ "	6"	6 ¹ / ₄ "	1 ¹ / ₄ "	3"	1"	gpm head spread	15 10"	22 12"	24 17"	26 22"	27 24"	29 28"				
NFO-125	.325"	4 ¹ / ₂ "	7"	8"	1 ¹ / ₂ "	4"	1 ¹ / ₄ "	gpm head spread	23 9"	29 16"	34 21"	39 25"	42 28"	43 30"	47 36"			
NFO-150	.375"	5 ¹ / ₄ "	7 ¹ / ₄ "	9 ¹ / ₄ "	1 ³ / ₄ "	5"	1 ¹ / ₂ "	gpm head spread	37 12"	45 17"	59 24"	62 30"	67 36"	72 40"	77 40"	86 44"		
NFO-200	.500"	7"	7 ³ / ₄ "	10"	3"	3"	2"	gpm head spread		48 7"	58 10"	62 16"	68 18"	74 24"	82 32"	85 40"	116 50"	
NFO-300	.750"	9 ¹ / ₄ "	13 ¹ / ₂ "	11 ¹ / ₂ "	3 ¹ / ₂ "	3 ¹ / ₂ "	3"	gpm head spread		110 7"	129 9"	139 11"	164 14"	167 15"	188 21"	202 24"	237 33"	290 47"



NGA series

Fan Jet



Specification:

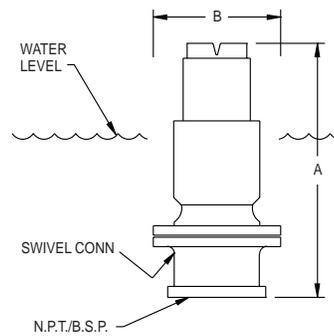
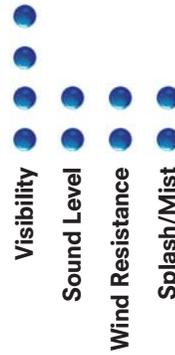
Construction shall be cast bronze, machined brass and copper with DEFO integral swivel base.

Note:

- (for optimum effect)
1. Requires non-turbulent water supply.
 2. Use shaded chart section.

Function

A clear fan-shaped display. Ideal when angled to 45° and used as a peripheral effect in a location free of wind. **Not water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	throw	2'	3'	5'	6'	8'	10'
NGA-100	.125"	4"	2 1/2"	1"	gpm head spread height	3 3' 20" 28"	5 5' 56" 45"	5 7' 101" 64"			
NGA-150	.250"	5 1/2"	3 1/4"	1 1/2"	gpm head spread height	11 3' 6" 28"	14 4' 24" 42"	18 6' 35" 64"	20 8' 79" 75"	23 10' 142" 108"	
NGA-200	.325"	8 1/4"	4 1/2"	2"	gpm head spread height	9 2' 5" 18"	11 3' 11" 24"	14 4' 24" 36"	17 6' 48" 56"	19 7' 48" 56"	21 8' 70" 70"



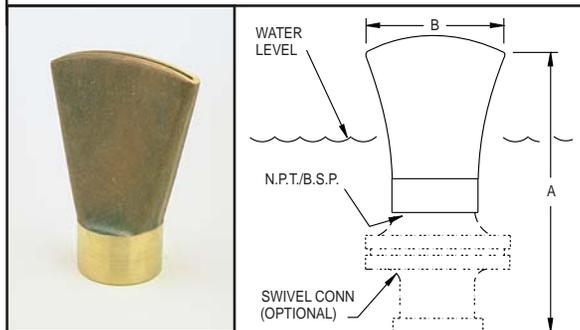
Fan Jet

NGB series

Function

A clear, widespread, fan-shaped display. Ideal when angled to 45° and used as a peripheral effect in a location free of wind. Most effective used in multiples. **Not water level dependent.**

- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	throw	2'	3'	5'	7'
NGB-100	.125"	4 1/4"	3"	1"	gpm head spread height	9 3' 20" 20"	12 4' 30" 24"	14 6' 65" 45"	19 8' 94" 52"

Specification:

Construction shall be cast bronze.

Options:

- (Add suffix)
- Q - chrome plated
 - S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
1. Requires non-turbulent water supply.
 2. Operate at 3' (1m) throw.
 3. Use shaded chart section.



NGF series

Finger Jet



Specification:

Construction shall be cast bronze, brass and stainless steel.

Options:

- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)

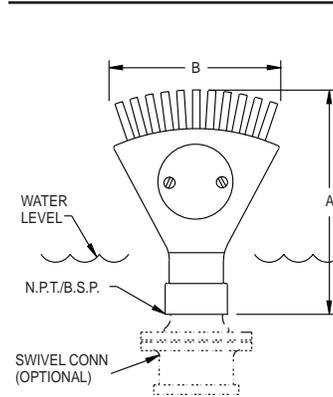
Note:

- (for optimum effect)
- 1. Requires fine screening at pump (see performance chart).
- 2. Use shaded chart section.

Function

A finger-like fan spray which is ideal as a peripheral adornment to vertical central displays in medium-sized installations. Excellent in wall mounted applications. Effective as an evaporative spray in pools and ponds or in water cooling. Large cleanout port. **Not water level dependent.**

- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	throw	spread	height	gpm	head
NGF-100	.125"	7"	6"	1"	2'	58"	18"	13	4'
					3'	86"	28"	17	5'
					4'	102"	35"	19	6'
					5'	120"	48"	23	8'
					6'	156"	52"	25	10'



Flat Jet

NGL series

Function

A clear, horizontal, fan-shaped display. Ideal as a low peripheral effect in a quiet location free of wind. **Not water level dependent.**

- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist

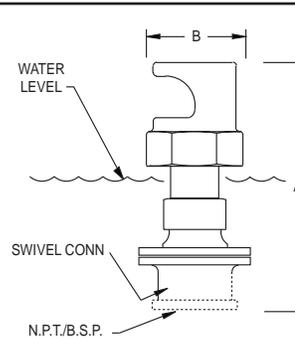


Specification:

Construction shall be cast bronze and brass with DEFO integral swivel connection.

Note:

- (for optimum effect)
1. Requires fine screening at pump (see performance chart).
 2. Requires non-turbulent water supply.
 3. Swivel alignment not to exceed 5°.
 4. Use shaded chart section.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	throw	2'	3'	4'	6'
NGL-050	.125"	4 1/2"	2 1/2"	1/2"	gpm head spread height	2 3' 36"	3 4' 53"	4 6' 72"	
NGL-075	.187"	5 1/2"	3"	3/4"	gpm head spread height	5 3' 39"	7 4' 57"	9 5' 80"	
NGL-100	.250"	7"	3 1/4"	1"	gpm head spread height	10 3' 36"	12 3' 48"	17 5' 80"	33 8' 120"



NHC series

Hollow Column Jet



Specification:

Construction shall be cast bronze, extruded machined brass, copper and stainless steel. Complete with integral swivel adjustment.

Options:

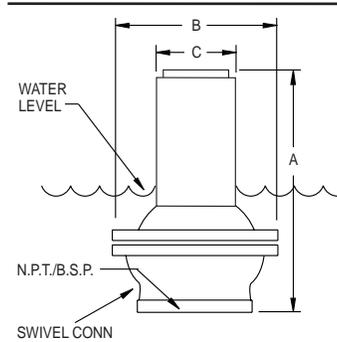
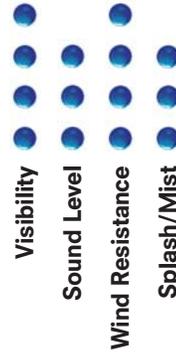
(Add suffix)
Q - chrome plated

Note:

- (for optimum effect)
- 1. Requires non-turbulent water supply.
- 2. Requires fine screening at pump (see performance chart).
- 3. Use shaded chart section.

Function

A hollow column of clear water that appears to be an overflowing glass tube. Cresting water creates minimum splash. Spectacular when illuminated. **Not water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	inlet (npt) (bsp)	spray height	1'	2'	3'	4'	5'	8'	10'
NHC-100	.060"	5 1/2"	2 1/2"	1 1/8"	1"	gpm head spread	11 3' 5"	16 4' 9"	20 7' 12"	23 8' 12"	37 10' 14"		
NHC-150	.090"	7"	3 1/4"	1 5/8"	1 1/2"	gpm head spread	22 3' 9"	31 4' 12"	37 6' 14"	43 7' 16"	47 9' 20"	60 13' 27"	67 17' 38"
NHC-200	.125"	7 1/4"	4 1/2"	2 1/8"	2"	gpm head spread	29 2' 9"	38 4' 13"	46 5' 16"	53 7' 18"	58 8' 27"	74 13' 48"	81 15' 48"
NHC-300	.250"	9"	6"	3"	3"	gpm head spread		75 3' 18"	91 5' 24"	108 6' 30"	124 6' 36"	158 10' 42"	182 13' 56"



NIC
series
water level
independent

Funnel Cascade Jet



Specification:

Construction shall be cast bronze, extruded machined brass and stainless steel fitted.

Options:

(Add suffix)
Q - chrome plated
S - DEFO swivel connections (see ASL/ASU series)

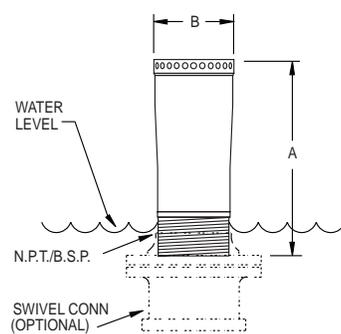
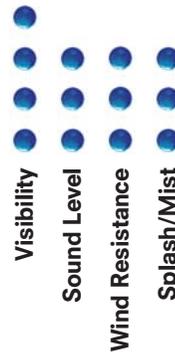
Note:

(for optimum effect)
Use shaded chart section.

Function

A rugged effect that can deliver a highly aerated water spray in less than ideal water conditions. For small and medium-sized displays with shallow water.

Not water level dependent.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	2'	3'	4'	5'	6'	8'
NIC-100	.250"	3 ³ / 4"	1 ³ / 4"	1"	gpm	23	28	32	34	36	42
					head	7'	9'	12'	14'	15'	21'
					spread	7"	12"	17"	20"	24"	29"



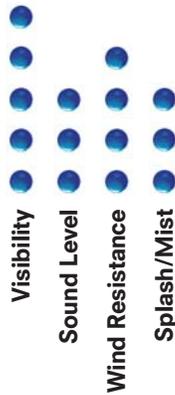
Foam Jet

NIL series

water level independent

Function

A column of frothy, white, aerated water. Recommended for small and medium-sized displays in shallow pools. Beautiful when illuminated. Optional exterior sleeve permits low profile installation and neat appearance in pools. **Water level independent without exterior sleeve.**



Specification:

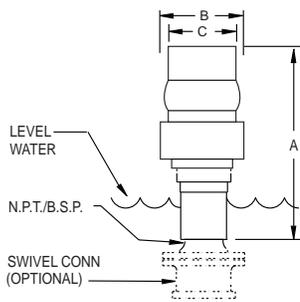
Construction shall be cast bronze and brass with internal air/water ratio adjustments. Optional exterior sleeve shall be copper or brass.

Options:

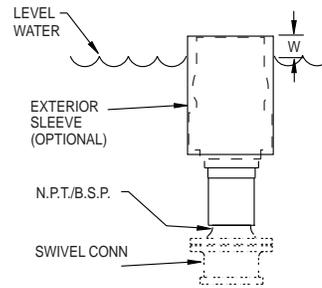
- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connections (see ASL/ASU series)
- X - exterior sleeve for low profile installation

Note:

- (for optimum effect)
1. Dimension 'W' (nozzle projection above water level) must be maintained.
 2. Requires fine screening at pump (see performance chart).
 3. Use shaded chart section.



Standard



Option X
Low Profile Application

Dimensions

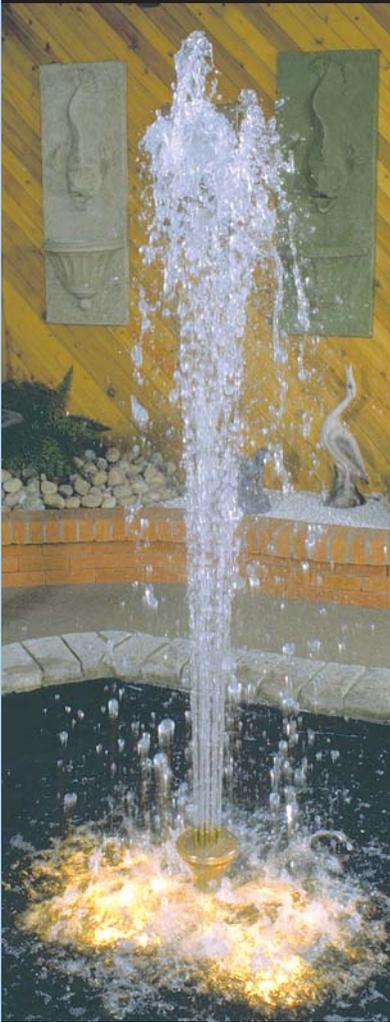
Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	w dim.	inlet (npt) (bsp)	spray height	2'	3'	5'	6'	8'	10'	11'
NIL-100	.065"	7"	3"	2' / 2"	1' / 2"	1"	gpm head spread	26 7"	32 11"	40 12"	44 21"	50 28"		
NIL-150	.080"	10"	5"	3' / 2"	2"	1' / 2"	gpm head spread	62 8"	80 14"	85 26"	96 15"	96 20"	99 24"	110 26"



NLC series

Column Jet



Specification:

Construction shall be machined bronze and brass. DEFO top shall be removable for easy cleaning.

Options:

- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)

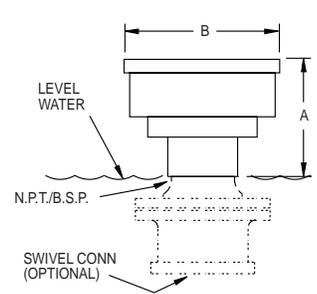
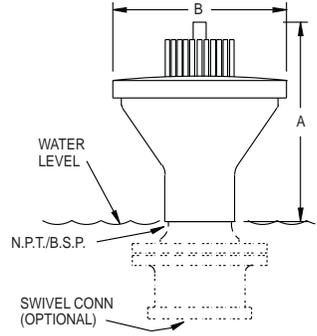
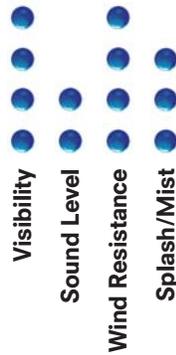
Note:

- (for optimum effect)
- 1. Requires fine screening at pump (see performance chart).
- 2. Use shaded chart section.

Function

A simple vertical column of clear water. Ideal as a focal point for small and medium-sized displays. Also appropriate as a peripheral effect for large displays.

Not water level dependent.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	2'	3'	4'	5'	6'	8'	10'	12'
NLC-075	.040"	2"	2 1/2"	3/4"	gpm head spread	10 4'	12 6'	14 8'	15 9'	16 11'			
NLC-125	.080"	5 3/4"	5"	1 1/4"	gpm head spread		16 5'	20 6'	24 9'	25 10'	30 13'	33 15'	38 20'
							12"	15"	20"	24"	24"	30"	36"



Crown Jet

NLF series



Specification:

Construction shall be machined cast bronze. Faceplate shall be removable for easy cleaning with a DEFO security key.

Options:

- (Add suffix)
- K - key (cover removal)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)
- W - winter cover

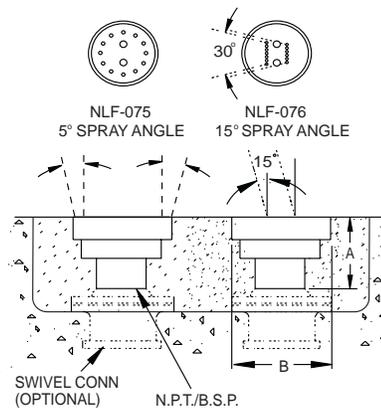
Note:

- (for optimum effect)
1. Requires fine screening at pump (see performance chart).
 2. Use shaded chart section.
 3. Contact factory for customized hole pattern.

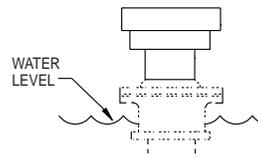
Function

Designed for casting into spray aprons in public playgrounds to ensure vandal resistant installation or used in small and medium sized pools. Gentle spray coverage. Generally installed in a group to form a circle. The angled NLF-076 crown jet can be used as a decorative spray feature for swimming pools and can aid in the cooling of the pool water in a hot climate. **Not water level dependent.**

Visibility	●	Sound Level	●	Wind Resistance	●	Splash/Mist	●
	●		●		●		
	●		●		●		
	●		●		●		



In-ground Application



Above Water Application



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	2'	3'	4'	6'
						gpm	gpm	gpm	gpm
NLF-075	.040"	2"	2 1/2"	3/4"	4	5	6	7	
					3'	5'	6'	10'	
NLF-076	.040"	2"	2 1/2"	3/4"	16"	22"	32"	44"	
					42"	62"	88"	144"	
					23"	32"	41"	80"	



NLG series

Ground Jet



Specification:

Construction shall be machined cast bronze. Faceplate shall be removable for easy cleaning with a DEFO security key.

Options:

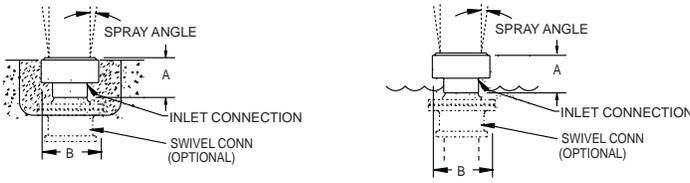
- (Add suffix)
- K - key (cover removal)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)
- W - winter cover

Note:

- (for optimum effect)
1. Requires fine screening at pump (see performance chart).
 2. Use shaded chart section.
 3. Contact factory for customized hole patterns.

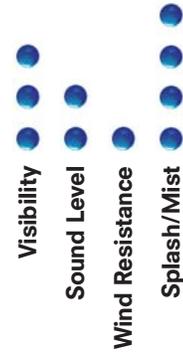
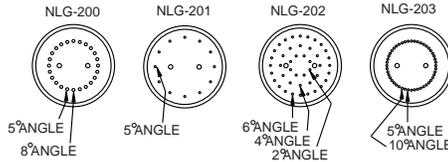
Function

A multi-purpose spray jet that can be used in small and medium-sized fountains. The jet can also be cast into spray aprons in public playgrounds to ensure vandal resistant installation. Gentle spray coverage. **Not water level dependent.**



In-ground Application

Above Water Application



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	3'	5'	10'
NLG-200	.030"	3"	5"	2"	gpm head spread	30 5' 48"	39 8' 72"	58 18' 132"
NLG-201	.030"	3"	5"	2"	gpm head spread	26 5' 29"	34 8' 50"	50 16' 96"
NLG-202	.030"	3"	5"	2"	gpm head spread	25 5' 36"	32 8' 53"	47 17' 94"
NLG-203	.030"	3"	5"	2"	gpm head spread	26 5' 54"	34 8' 80"	48 15' 132"



Mushroom/Bell Jet

NMB series

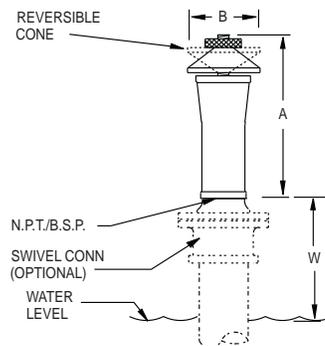
Function
 A clear sheet of pulsating water capable of assuming dual forms. The effect can be changed from mushroom to bell by simply reversing the top cone. Quiet and splash-free. Ideal for small areas which are free of wind. **Not water level dependent.**

- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist

Bell Pattern



Mushroom Pattern



Specification:
 Construction shall be machined cast bronze and brass with DEFO reversible top cone.

Options:
 (Add suffix)
 Q - chrome plated
 S - DEFO swivel connection (see ASL/ASU series)

Note:
 (for optimum effect)
 1. Requires fine screening at pump (see performance chart).
 2. Requires non-turbulent water supply.
 3. Use shaded chart section.

Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim.	inlet (npt) (bsp)	spray diameter	12"	24"	36"
NMB-075	.063"	4 ³ / ₄ "	2"	9"	3/4"	gpm head	4 2'	5 2'	
NMB-100	.063"	5 ³ / ₄ "	2 ⁵ / ₈ "	9"	1"	gpm head	5 2'	7 2'	10 3'



Bell Jet

NMF series

Function

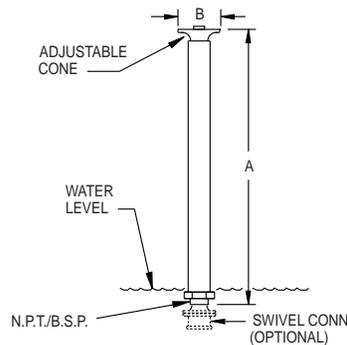
A clear sheet of water in the shape of a bell. Minimal sound or splash. Ideal for small and medium-sized displays in locations which are free of wind. Suitable for groupings in varying heights. **Not water level dependent.**



- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist



Standard **Option Q**
Chromed



Specification:

Construction shall be machined cast bronze, copper and brass with DEFO adjustable top cone.

Options:

- (Add suffix)
- Q - chrome plated
 - S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
1. Requires non-turbulent water supply.
 2. Requires fine screening at pump (see performance chart).
 3. Use shaded chart section.

Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray diameter	12"	24"	30"	48"
NMF-051	.063"	6"	1 ⁵ / 8"	1 / 2"	gpm head	6	9	10	
NMF-052		9"				3'	5'	6'	
NMF-053		12"							
NMF-101	.063"	12"	2 ¹ / 8"	1'	gpm head	9	11	12	13
NMF-102		18"				3'	5'	6'	8'
NMF-103		24"							



NMH series

Hollow Stream Jet



Function

A versatile jet which can produce a wide variety of effects, from a mushroom sheet to a vertical hollow coned column, by simply adjusting the outer sleeve. Ideal for small and medium-sized displays. **Not water level dependent.**

Specification:

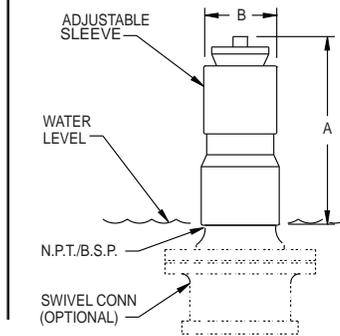
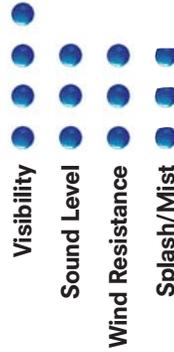
Construction shall be machined cast bronze, brass and copper with lockable DEFO adjustable sleeve.

Options:

- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Requires fine screening at pump (see performance chart).
- 2. Use shaded chart section.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	2'	3'	4'	5'	6'	8'	10'	15'
NMH-200	.250"	8 ⁵ / 4"	2 ¹ / 2"	2"	gpm	37	45	50	55	61			
					head	3'	5'	6'	8'	9'			
NMH-300	.250"	10 ¹ / 4"	3 ⁵ / 8"	3"	gpm	47	56	66	71	83	90	100	
					head	3'	4'	5'	7'	9'	10'	12'	
NMH-400	.250"	12"	4 ³ / 4"	4"	gpm	96	111	124	153	164	182	211	260
					head	4'	5'	6'	7'	8'	10'	12'	20'
NMH-600	.250"	17 ³ / 4"	7 ¹ / 4"	6"	gpm	250	300	350	400	500	600	700	1000
					head	6'	8'	10'	12'	14'	16'	20'	30'
					spread	84"	96"	108"	120"	132"	VERTICAL	VERTICAL	VERTICAL



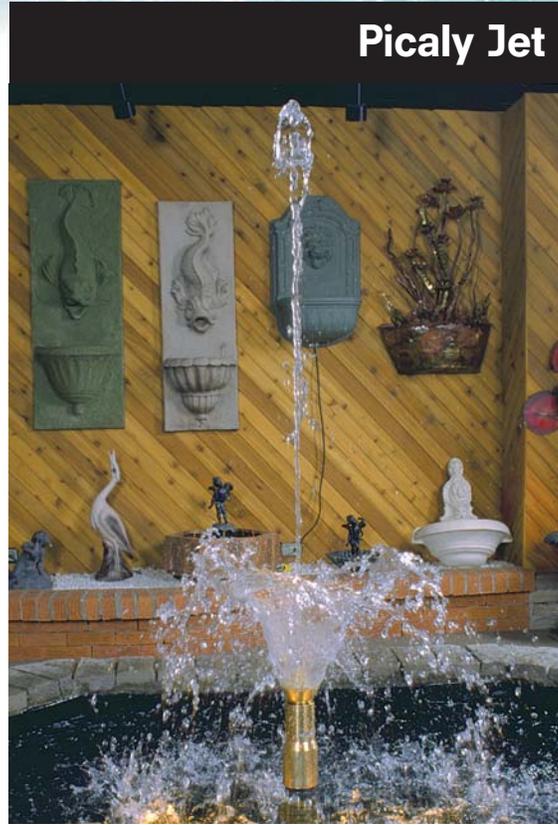
Picaly Jet

NMP series

Function

A tulip-like display with a center vertical stream. Ideal as a peripheral effect in wind protected areas for small to medium-sized fountains. **Not water level dependent.**

- Visibility
- Sound Level
- Wind Resistance
- Splash/Mist



Specification:

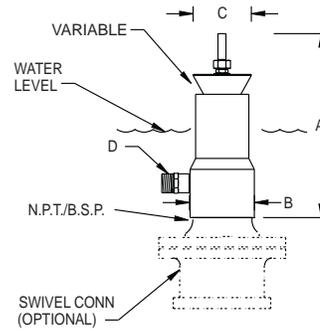
Construction shall be machined cast bronze, brass and copper.

Options:

- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Requires fine screening at pump (see performance chart).
- 2. Use shaded chart section.



Dimensions

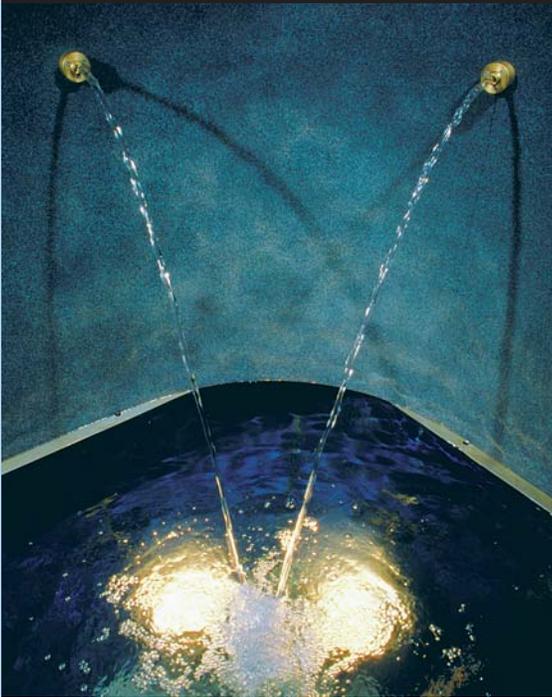
Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	d dim.	inlet (npt) (bsp)	spray height	5'	6'	8'	10'	15'
NMP-200	.125"	10"	2 ³ / ₄ "	2 ³ / ₄ "	1 ¹ / ₂ "	2"	gpm head spread	50 8' 2'	63 10' 4'	80 12' 6'		
NMP-300	.125"	12"	4"	3 ³ / ₄ "	1"	3"	gpm head spread	85 8' 6'	115 10' 10'	142 12' 12'	170 14' 18'	
NMP-400	.125"	17"	8"	8"	1 ¹ / ₂ "	4"	gpm head spread	148 8' 6'	206 10' 12'	270 12' 17'	325 14' 21'	400 20' 26'



NMS series

Mini-Spout Jet



Specification:

Construction shall be from extruded brass with stainless steel fasteners.

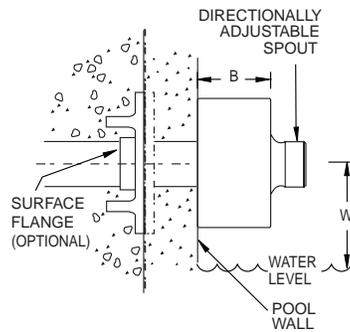
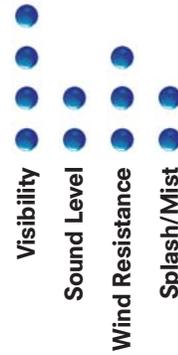
Options:

- (Add suffix)
- K - surface flange
- L - membrane clamp
- Q - chrome plated

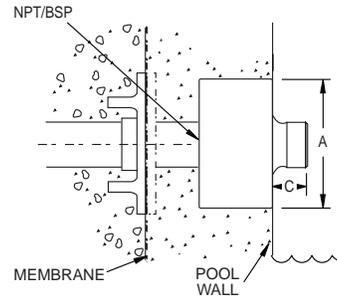
Function

A clear stream jet that falls gracefully into pools. Used for wall mounted applications either flush or surface mounted. Integral swivel permits directional adjustments to the stream.

For use primarily in small architectural pools. **Not water level dependent.**



Surface Mounted Application



Flushwall Application

Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	w dim.	inlet (npt) (bsp)	throw	gpm	head
NMS-050	.250"	2"	1"	3/8"	20"	3/4"	6" 12" 20"	3 4 5	2' 2' 2'

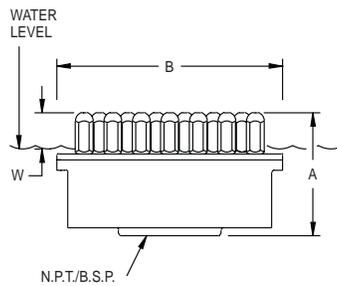
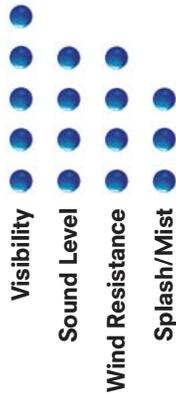


Column Pod

NPA series

Function

A large vertical column consisting of concentric rows of clear stream nozzles. Excellent for viewing at great distances, especially when illuminated.
Not water level dependent.



Specification:

Construction shall be cast bronze with DEFO precision clear stream brass nozzles, neoprene gasket and stainless steel fasteners.

Options:

- (Add suffix)
- S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Requires fine screening at pump (see performance chart).
- 2. Dimension 'W' (nozzle projection above water) must be maintained.
- 3. Use shaded chart section.

Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim. min.	stream size	no. of jets	inlet (npt) (bsp)	spray height	10'	15'	20'	25'	30'	40'
NPA-100	.125"	6"	10"	2"	9"	51	4"	gpm head spread	212 17' 60"	260 28' 72"	287 33' 84"	309 37' 96"	369 54' 114"	
NPA-200	.187"	9"	12"	3"	10"	36	4"	gpm head spread	290 20' 60"	360 30' 75"	420 40' 96"			
NPA-300	.187"	10 ¹ / ₂ "	16"	3"	12"	36	6"	gpm head spread			420 35' 108"	480 40' 120"	530 45' 132"	630 55' 148"



NPB series

Medium Foam Pod



Specification:

Construction shall be cast bronze, brass and copper with integral brass debris screen and 16 DEFO custom aerating nozzles.

Options:

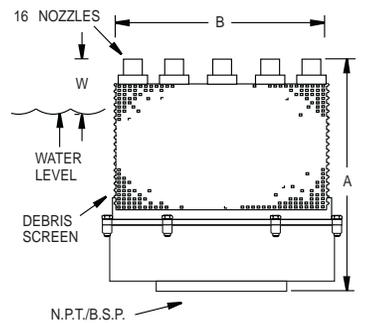
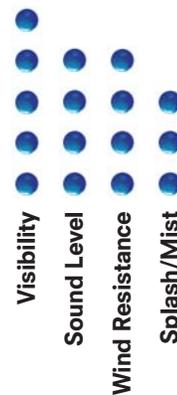
- (Add suffix)
- S - DEFO swivel connection (see ASL/ASU series)
- W - wave suppression device

Note:

- (for optimum effect)
- 1. Dimension 'W' (nozzle projection above water) must be maintained.
- 2. A constant unvarying water level is required.
- 3. Wave suppression device required when used in small circular pools or confined areas.
- 4. Use shaded chart section.

Function

A foamy column of water which pulsates as it rises in height. A continuously changing pattern creates visual interest. Very little splash. Ideal for medium-sized pools. **Water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim.	stream size	inlet (npt) (bsp)	spray height	10'	12'	15'	20'
NPB-100	.200"	14"	12"	3"	11"	3"	gpm head spread	209 51' 84"	214 56' N/A	225 72' N/A	261 93' N/A

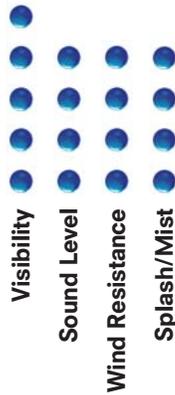


Crown Pod

NPC series

Function

A versatile two-tiered display of foamy streams. The effect is adjustable to allow for height and pattern changes. **Water level dependent.**



Specification:

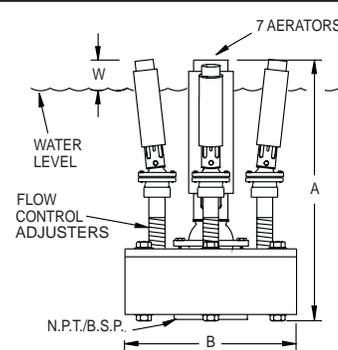
Construction shall be cast bronze and brass with 7 DEFO swivel mounted aerating nozzles complete with adjustable flow regulators.

Options:

(Add suffix)
W- wave suppression device

Note:

- (for optimum effect)
1. Dimension 'W' (nozzle projection above water) must be maintained.
 2. A constant unvarying water level is required.
 3. Wave suppression device required when used in small circular pools or confined areas.
 4. Use shaded chart section.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim.	inlet (npt) (bsp)	spray height	5'	8'	10'	15'	20'	25'	30'	35'	40'	50'
NPC-100	.125"	14"	9"	2"	2"	gpm head spread*	45 24'	50 33' 14'	58 65' 16'							
NPC-200	.200"	16 ¹ / ₂ "	12"	2 ¹ / ₂ "	3"	gpm head spread*	64 24' 10'	77 35' 14'	87 42' 20'	104 58' 28'						
NPC-300	.325"	20"	14"	3"	4"	gpm head spread*	93 24' 16'	103 29' 20'	120 40' 26'	127 42' 30'						
NPC-400	.325"	24"	19 ¹ / ₂ "	4"	4"	gpm head spread*			218 35' 20'	248 51' 32'	280 58' 35'	316 70' 44'	344 84' 50'	393 112' 66'		
NPC-500	.500"	25"	19 ¹ / ₂ "	3 ¹ / ₂ "	6"	gpm head spread*				449 37' 24'	518 51' 34'	533 56' 38'	606 67' 42'	653 79' 48'	699 88' 58'	798 109' 72'

* Spread will vary according to adjustable nozzle setting.



NPD series

Mist Column Pod



Specification:

Construction shall be machined brass and cast bronze with 16 custom DEFO precision nozzles.

Options:

(Add suffix)
 S - DEFO swivel connection
 (see ASL/ASU series)

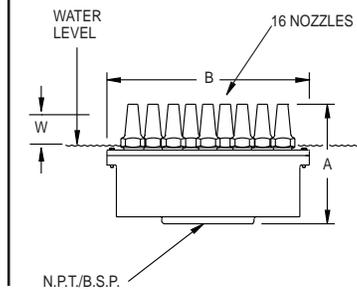
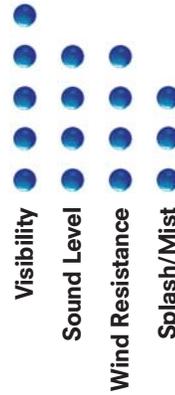
Note:

- (for optimum effect)
- 1. DEFO ECW wind control panel recommended in windy locations.
- 2. Dimension 'W' (nozzle projection above water) must be maintained.
- 3. Use shaded chart section.

Function

A majestic clear column of water which produces a misty and lacy effect. Ideal for evaporative or cooling ponds. Produces a good visual effect from a distance.

Not water level dependent.



Dimensions

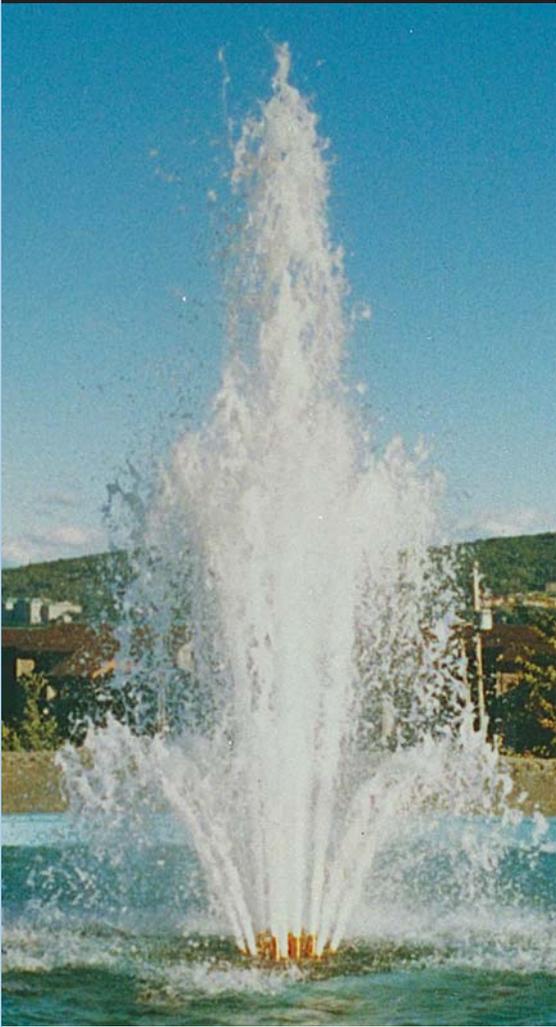
Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim. min.	stream size	inlet (npt) (bsp)	spray height	10'	15'	20'	25'	30'	35'	40'
NPD-100	.125"	8"	10"	3"	9"	3"	gpm head spread	100 48"	130 60"	147 72"	166 84"	185 96"	203 108"	221 120"



NPW series

Large Watercastle Pod



Specification:

Construction shall be cast bronze, brass and copper with 17 DEFO swivel mounted aerating nozzles complete with adjustable flow regulators.

Options:

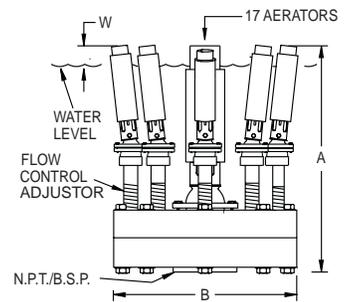
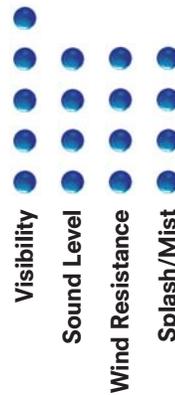
(Add suffix)
W- wave suppression device

Note:

- (for optimum effect)
- 1. Dimension 'W' (nozzle projection above water) must be maintained.
- 2. A constant unvarying water level is required.
- 3. Wave suppression device required when used in small pools or confined areas.
- 4. Use shaded chart section.

Function

A dramatic three-tiered water castle effect with aeration nozzles. Effect is adjustable to allow for height and pattern changes. Ideal for viewing from great distances. **Water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim.	inlet (npt) (bsp)	spray height	10'	15'	20'	30'	40'	50'
NPW-100	.250"	24"	19' / 2"	4"	4"	gpm head spread*	359 35' 20'	437 51' 28'	502 65' 36'	610 93' 46'		
NPW-200	.250"	25"	19' / 2"	4"	6"	gpm head spread*	574 49' 24'	685 81' 38'	763 81' 44'	869 104' 60'	954 118' 76'	

* Spread will vary according to adjustable nozzle setting.



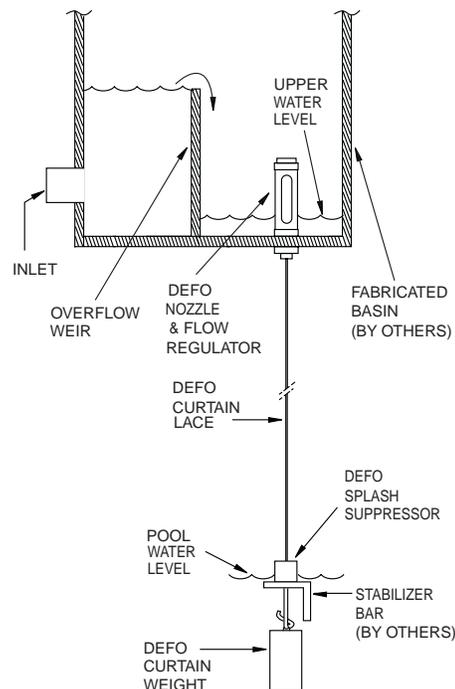
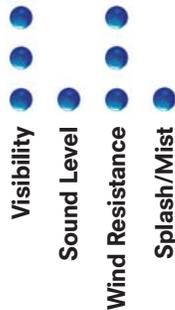
Rain Curtain

NRC series

Function

A spectacular effect of water droplets falling from great heights in slow motion, quietly and without splash.

Laces may be installed up to 20° from vertical without compromising the effectiveness of the rain curtain. Curtain can take many forms. Dazzling when illuminated.



Specifications:

NRC-100, NRC-101

Curtain laces shall be clear Mylar, 0.250" (6 mm) x length to suit. NRC-100 spool length is 100' (30m). NRC-101 spool length is 600' (200m). Specify when ordering.

NRC-200

DEFO nozzle assembly shall be hexagonal brass, 0.50" (12 mm) x 2" (50 mm) with brass lock ring, washer, locknut and neoprene gasket.

NRC-300

Splash suppressor shall be clear plastic, 0.33" (7 mm) x 2" (50 mm).

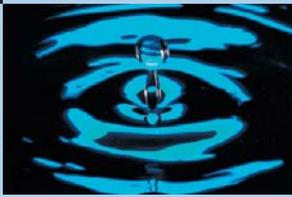
NRC-400

DEFO curtain weights shall be lead, 3/4 lbs (450 gm).

Note:

(for optimum effect)

1. Each nozzle requires 6 gph (0.1 lpm) at a 0.75" (20 mm) water depth at nozzle.
2. Nozzle spacing should be 1.125" (32 mm) minimum.
3. Utilize only filtered and softened water to prevent clogging and discoloring of lace.
4. Contact the factory for design and installation recommendations.



NSJ series

Spray Jewel Jet



Specification:

Construction shall be machined bronze and brass. DEFO top shall be removable for easy cleaning.

Options:

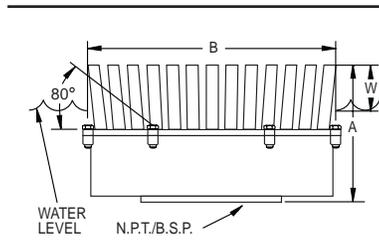
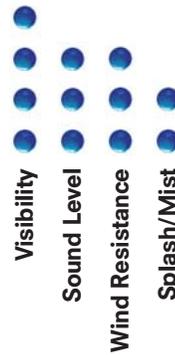
(Add suffix)
 S - DEFO swivel connection
 (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Dimension 'W' (nozzle projection above water level) must be maintained.
- 2. Requires fine screening at pump (see performance chart).
- 3. Use shaded chart section.

Function

A graceful spray effect that can be used as a centerpiece for small to large fountains. Individual nozzles produce jewel-like effervescent streams when illuminated at night.
Not water level dependent.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	w dim. min.	no. of jets	inlet (npt) (bsp)	spray height	3'	5'	8'	10'	15'
NSJ-100	.125"	5"	4' / 2"	2"	24	1' / 4"	gpm head spread	42 5'	53 8'	62 11'		
NSJ-200	.125"	5"	7"	2"	36	2"	gpm head spread	62 5'	80 8'	93 12'		
NSJ-300	.125"	5' / 4"	9' / 4"	2"	48	3"	gpm head spread	53 4'	73 6'	100 8'	111 11'	
NSJ-400	.125"	7' / 4"	11' / 2"	4"	36	4"	gpm head spread	115 5'	172 8'	248 12'	314 14'	429 20'
NSJ-600	.125"	9' / 2"	14' / 4"	4"	48	6"	gpm head spread	153 5'	279 8'	330 12'	419 14'	570 20'



NTO series

Twirl Jet



Specification:

Construction shall be machined cast bronze, brass and copper with DEFO integral angle and rate adjustments.

Options:

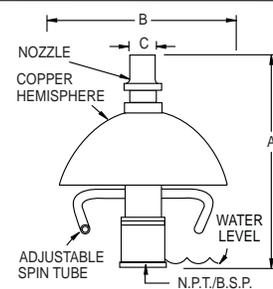
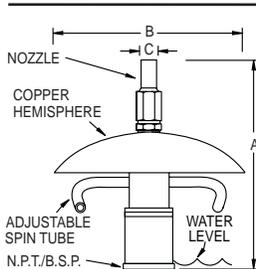
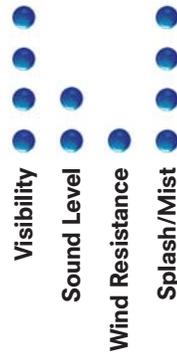
(Add suffix)
 Q - chrome plated
 S - DEFO swivel connection
 (see ASL/ASU series)

Note:

- (for optimum effect)
1. Angle and rate of rotation adjustable.
 2. Requires fine screening at pump (see performance chart).
 3. Use shaded chart section.

Function

A column of water spirals gracefully upwards to form an encircling lariat of droplets. Ideal as a peripheral effect for medium to large installations with large pool areas. **Not water level dependent.**



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	c dim.	inlet (npt) (bsp)	spray height	3'	4'	5'	8'	10'
NTO-075	.065"	4 1/2"	2"	3/8"	3/4"	gpm head spread*	5 4'	5.5 5'	5.7 7'	7 11'	
NTO-150	.125"	8"	5 1/2"	1 1/4"	1 1/2"	gpm head spread*			26 9'	33 15'	42 24'

* Spread will vary according to adjustable nozzle setting.



Watercastle Jet

NWA series adjustable nozzles

Function:

A graceful spray effect with adjustable nozzles to allow adaptability to site requirements. Ideal for small and medium sized displays. **Not water level dependent.**

Visibility
 Sound Level
 Wind Resistance
 Splash/Mist



Specification:

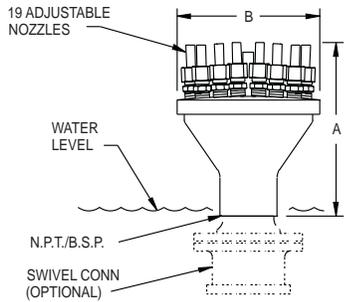
Construction shall be cast bronze, machined brass and copper with DEFO adjustable nozzles and removable cap for easy cleaning.

Options:

- (Add suffix)
- Q - chrome plated
- S - DEFO swivel connection (see ASL/ASU series)

Note:

- (for optimum effect)
- 1. Requires fine screening at pump (see performance chart).
- 2. Use shaded chart section.



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	4'	5'	6'	7'	8'	9'	10'	12'
NWA-125	.125"	5 ⁵ / ₄ "	5"	1 ¹ / ₄ "	gpm head spread*	21 6'	22 7'	26 9'	28 10'	31 11'	32 13'	35 16'	38 19'
						64"	72"	100"	108"	128"	130"	144"	192"

* Spread will vary according to adjustable nozzle setting.



NWC series

Watercastle Jet

NWC-075



Specification:

Construction shall be cast bronze, brass and copper with DEFO removable cap for easy cleaning.

Option:

(Add suffix)
 Q - chrome plated
 S - DEFO swivel connection (see ASL/ASU series)

Note:

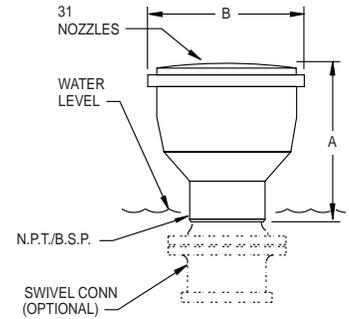
- (for optimum effect)
1. Requires fine screening at pump (see performance chart).
 2. Install perfectly vertical.
 3. Use shaded chart section.

Function

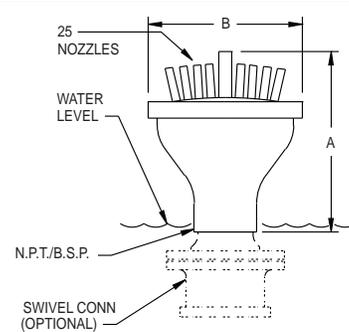
A sparkling and unique triple-tiered effect of clear streams. Ideal for small and medium-sized displays. **Not water level dependent.**



NWC-075



NWC-125



Dimensions

Performance

DEFO no.	suction strainer openings required	a dim.	b dim.	inlet (npt) (bsp)	spray height	2'	3'	4'	5'	6'	7'	8'	9'	10'
NWC-075	.065"	3"	3 1/4"	3/4"	gpm head spread		11 7'	14 10'	18 12'	21 28'				
							25"	36"	60"	77"				
NWC-125	.125"	5 3/4"	5"	1 1/4"	gpm head spread			19 6'	21 7'	23 8'	25 10'	28 12'	30 14'	33 16'
								36"	48"	60"	72"	80"	96"	108"

Replacement Parts

General Information for Spray Jets:

Spread:

The measured spread on a spray jet includes the splash zone of the nozzle. This measurement is intended to be used when determining the position of a nozzle in relation to the pool edge.

Standard Threading:

Standard threading on DEFO components shall be National Pipe Thread (NPT) unless requested otherwise at the time of order. All thread sizes less than 1" will be NPT.

Engineering:

At Crystal Fountains Inc., we are dedicated to engineering accuracy and stand behind our products. The spray jets manufactured by our company have been tested using calibrated instrumentation for flow rate and pressure head at the facilities of the Canadian Hydraulics Centre under the auspices of the National Research Council of Canada (NRC).



Debris Screens

Nozzle Level



Cover Removal Keys



Swivel Connectors



Winter Cover



Finger Jets



Spray Ring Jets

Debris Screens	
Part #	Use with Item
NAE075D	NAE-075
NAE100D	NAE-100
NAE125D	NAE-125
NAE150D	NAE-150
NAE200D	NAE-200
NAE300D	NAE-300
NAE400D	NAE-400

Nozzle Level	
Part #	Use with Item
NLA100	All spray jets

Cover Removal Keys	
Part #	Use with Item
NLF075K	NLF-075/076
NLG200K	NLG-200/201/202/203

Swivel Connectors	
Part #	Use with Item
ASU/ASL	See page # 90

Winter Covers	
Part #	Use with Item
NLF075W	NLF-075/076
NLG200W	NLG-200/201/202/203

Finger Jets	
Part #	Use with Item
NGF100C40	NGF/NLC

Spray Ring Jets	
Part #	Use with Item
NEA012	NSR-122 thru 822
NEA025	NSR-223 thru 823

Visibility

Sound Level

Wind Resistance

Splash/Mist

Performance Characteristics Rating System

These characteristics are measured on a scale of 1 to 5. 1 is considered low and 5 is considered high.



Lighting



Product		Pg
EL 010	Lights	48
EL 015	Lights	49
EL 020	Lights	50
EL 025	Lights	51
EL 030	Lights	52
EL 040	Lights	53
EL 050	Lights	54
EL 100	Lights	55
ELD	Lights	56
ELN	Lights	57



EL

010 series

Low-Intensity Underwater Light

Specification:

Construction of fixture and base shall be cast bronze with DEFO cylindrical 'mirro'-chromed stainless steel adjustable reflector; clear, tempered, heat resistant, cast glass globe; U-shaped moulded gasket of approved material; copper fitted porcelain socket with medium screw base; and brass or stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

(Add suffix)
 O - thermal cut off
 P - bronze lens guard
 W - DEFO stainless steel wall bracket

Note:

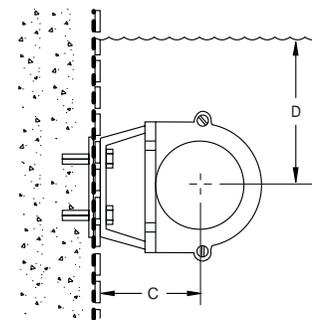
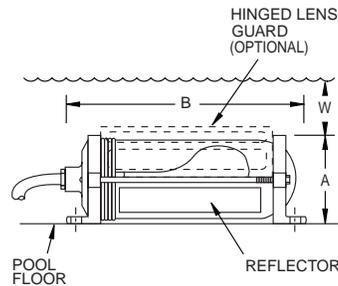
1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. CSA and UL listed.
3. Lamps sold separately (see lamp selection chart on page 58).



Option P



Option W



Option W

Dimensions

DEFO no.	a dim.	b dim.	c dim.	d dim.	w dim.
ELA-010	4"	9"	2 1/2"	4"	2"

Function

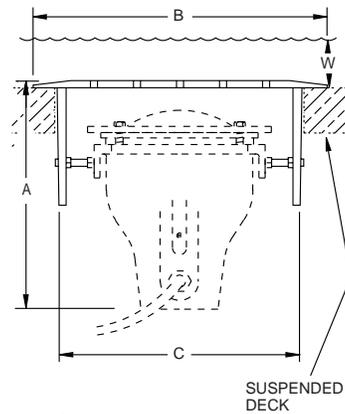
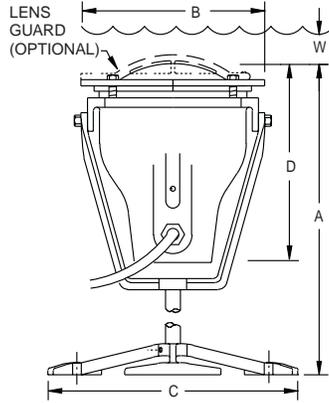
Low-intensity DEFO underwater light fixture for subdued illumination areas such as spillways, waterfalls and peripheral lighting. Ideal for shallow pools. May be floor or wall mounted. Fixture must be submerged while in operation.



Low-Intensity Underwater Light

Function

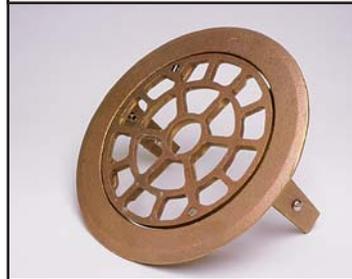
Low-intensity light for underwater narrow beam illumination. May be utilized with a variety of lamps from 100W to 250W. Fixture must be submerged while in operation.



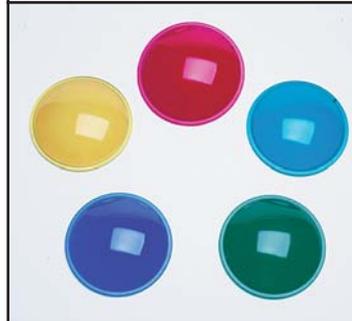
Option S

Dimensions

DEFO no.	a dim.	b dim.	c dim.	d dim.	w dim.
ELC-015	11"	7 1/4"	10"	8"	2"
OPT-S	9"	10 1/4"	8 1/2"		



Option P



EL 015 series

Specification:

Construction of fixture, swivel yoke and crowfoot base shall be cast bronze with clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; copper fitted porcelain socket with medium screw base suitable for PAR 38 quartz halogen or incandescent lamps; and stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

- (Add suffix)
 O - thermal cut off
 P - hinged lens guard
 Q - chromed top
 S - DEFO slab hanger

Lens colour:

- (Add suffix)
 A - amber
 B - blue
 G - green
 R - red
 T - turquoise

Note:

1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. CSA and UL listed.
3. Lamps sold separately (see lamp selection chart on page 58).
4. Specify 'A' on ELC-015 if greater than 11"! Contact factory for pricing.



EL 020 series

Low-Profile Underwater Light

Specification:

Construction of fixture and base shall be cast bronze with DEFO round, concave, 'mirro'-chromed brass reflector; clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; S4 type porcelain socket; and stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

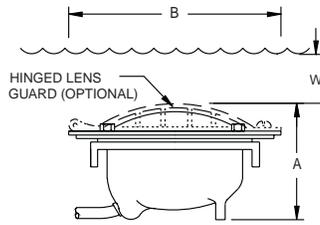
- (Add suffix)
- P - hinged lens guard
- O - thermal cut off
- Q - chromed top
- S - DEFO slab hanger

Lens colour:

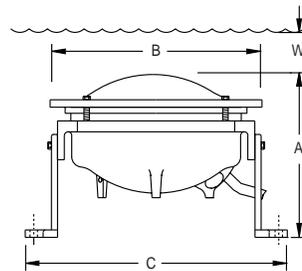
- (Add suffix)
- A - amber
- R - red
- B - blue
- G - green
- T - turquoise

Note:

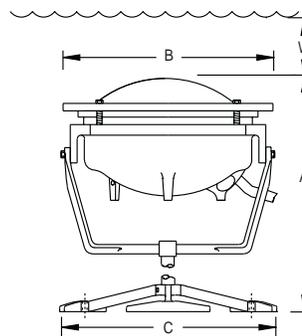
1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. 'T' foot base must always be fastened to pool floor.
3. CSA and UL listed.
4. Lamps sold separately (see lamp selection chart on page 58).
5. Specify 'A' on ELC-020 if greater than 9" Contact factory for pricing.



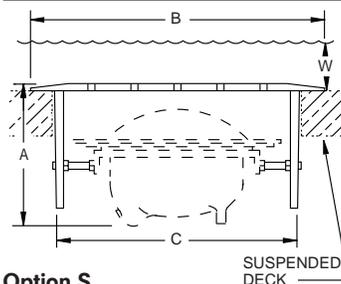
ELA-020



ELB-020



ELC-020



Option S



Option P

Function

This versatile, low-profile and energy efficient DEFO underwater light fixture may be utilized in water depths from 4" (100 mm) to 18" (460 mm). The parabolic reflector provides a controlled beam projection. Fixture must be submerged while in operation.

Dimensions

DEFO no.	a dim.	b dim.	c dim.	w dim.
ELA-020	4"	7 1/4"		2"
ELB-020	6 1/4"	7 1/4"	8 1/2"	2"
ELC-020	9"	7 1/4"	8 5/4"	2"
OPT-S	4 1/2"	10 1/4"	8 1/2"	2"



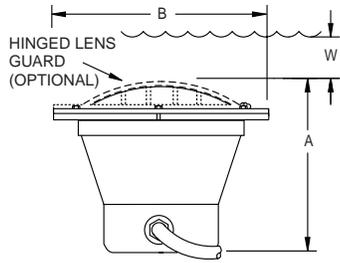


Floating Fountain Light

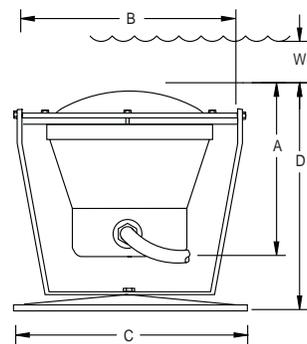
EL 028 series

Function

Heavy-duty, general-purpose under-water light fixture with wide lens. Ideal for use on floating fountains where light weight fixtures are required. Can operate using 300 watt or 500 watt lamps. Fixture must be submerged while in operation.



ELA-028



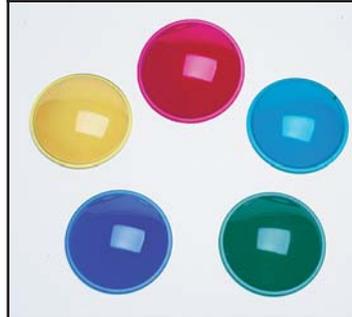
ELC-028

Dimensions

DEFO no.	a dim.	b dim.	c dim.	d dim.	w dim.
ELA-028	6 1/2"	10"			2"
ELC-028	6 1/2"	10"	8 3/4"	11"	2"



Option P



Specification:

Construction of fixture shall be copper with cast bronze rings. Base shall be cast bronze with clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; porcelain mogul end prong PAR type socket; and stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

- (Add suffix)
- P - hinged lens guard
- O - thermal cut off
- Q - chromed top

Lens colour:

- (Add suffix)
- A - amber
- R - red
- B - blue
- G - green
- T - turquoise

Note:

1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. Ring base must always be fastened.
3. UL listed.
4. Lamps sold separately (see lamp selection chart on page 58).
5. Specify 'D' on ELC-050 if greater than 10"! Contact factory for pricing.



EL 030 series

Low Voltage Underwater Light

Specification:

Construction of fixture shall be cast bronze with clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; and stainless steel lamp holder and fasteners. Illumination shall be 12 volt, 225 watt quartz halogen. Cable shall be 9' (2.75 m), type 10/3 submersible.

Options:

- (Add suffix)
- O - thermal cut off
- P - hinged lens guard
- Q - chromed top
- S - DEFO slab hanger

Lens colour:

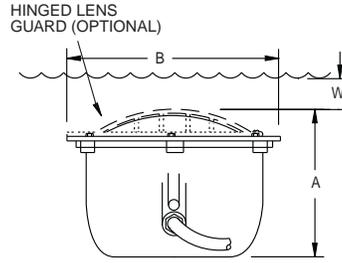
- (Add suffix)
- A - amber
- R - red
- B - blue
- G - green
- T - turquoise

Note:

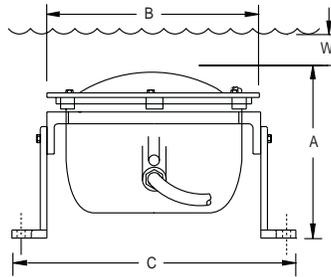
1. Fixture must be installed by a qualified electrician and comply with local electrical codes.
2. 'T' foot base must always be fastened to pool floor.
3. UL listed.
4. Lamps included in price.
5. Specify 'A' on ELC-030 if greater than 11". Contact factory for pricing.



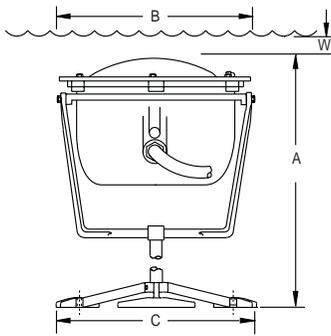
Option P



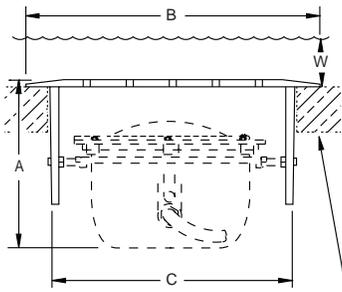
ELA-030



ELB-030



ELC-030



Option S

SUSPENDED DECK

Function

This versatile, low-profile and low voltage (12V) DEFO underwater light fixture may be utilized in water depths from 8" (200 mm) to 18" (460 mm). Ideal for lighting heavy water effects. May be installed in series format. Fixture must be submerged while in operation.

Dimensions

DEFO no.	a dim.	b dim.	c dim.	w dim.
ELA-030	5 1/4"	7 1/4"		2"
ELB-030	6 1/4"	7 1/4"	8 1/2"	2"
ELC-030	11"	7 1/4"	9 1/4"	2"
OPT-S	5 1/2"	10 1/4"	8 1/2"	2"



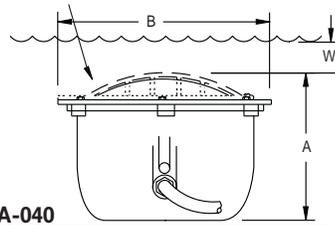
Low Voltage Underwater Light

Function

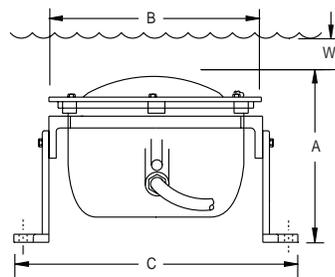
This versatile, low-profile and low voltage DEFO underwater light fixture may be utilized in water depths from 8" (200 mm) to 18" (460 mm). Ideal for lighting medium-sized water effects. May be installed in series format. Fixture must be submerged while in operation.



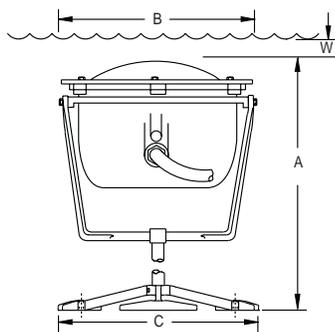
HINGED LENS
GUARD (OPTIONAL)



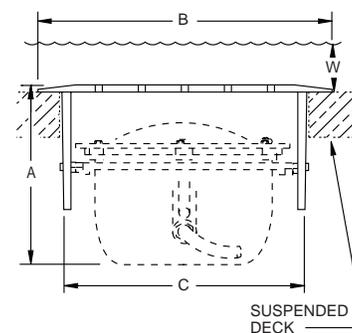
ELA-040



ELB-040



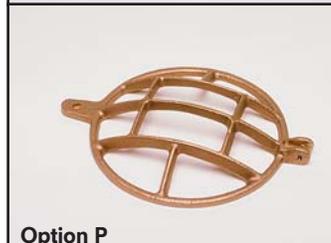
ELC-040



Option S

Dimensions

DEFO no.	a dim.	b dim.	c dim.	w dim.
ELA-040	5 1/4"	7 1/4"		2"
ELB-040	6 1/4"	7 1/4"	8 1/2"	2"
ELC-040	11"	7 1/4"	9 3/4"	2"
OPT-S	5 1/2"	10 1/4"	8 1/2"	2"



Option P

EL 040 series

Specification:

Construction of fixture shall be cast bronze with clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; and stainless steel lamp holder and fasteners. Illumination shall be

12 volt, 300 watt or 24 volt, 200 watt quartz halogen. Cable shall be 9' (2.75 m), type 10/3 submersible.

Options:

(Add suffix)

- O - thermal cut off
- P - hinged lens guard
- Q - chromed top
- S - DEFO slab hanger

Lens colour:

(Add suffix)

- A - amber
- R - red
- B - blue
- G - green
- T - turquoise

Note:

1. Fixture must be installed by a qualified electrician and comply with local electrical codes.
2. T' foot base must always be fastened to pool floor.
3. UL listed.
4. Lamps included in price.
5. Specify 12 or 24 volt when ordering
6. Specify 'A' on ELC-040 if greater than 11"! Contact factory for pricing.



EL 050 series

Heavy-Duty Underwater Light

Specification:

Construction of fixture and base shall be cast bronze with clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; porcelain mogul end prong PAR type socket; and stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

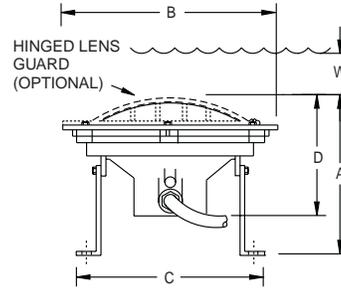
(Add suffix)
 O - thermal cut off
 P - hinged lens guard (OPTIONAL)
 Q - chromed top

Lens colour:

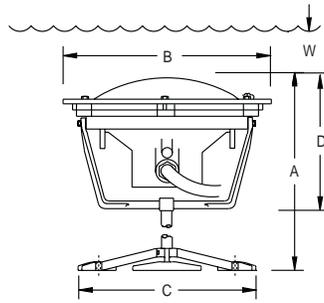
(Add suffix)
 A - amber
 R - red
 B - blue
 G - green
 T - turquoise

Note:

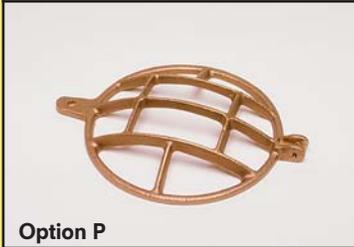
1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. 'T' foot base must always be fastened.
3. CSA and UL listed.
4. Lamps sold separately (see lamp selection chart on page 58).
5. Specify 'A' on ELC-050 if greater than 10'. Contact factory for pricing.



ELB-050



ELC-050



DEFO no.	a dim.	b dim.	c dim.	d dim.	w dim.
ELB-050	8"	10 ¹ / ₄ "	8 ¹ / ₂ "	6"	2"
ELC-050	10"	10 ¹ / ₄ "	9 ³ / ₄ "	7 ¹ / ₂ "	2"

Function

Heavy-duty, general-purpose underwater light fixture with wide lens. Ideal for lighting heavy water effects. Can operate using 300 watt or 500 watt lamps. Fixture must be submerged while in operation.

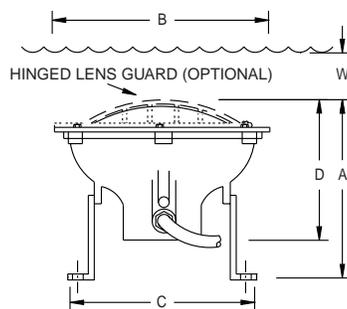


Heavy-Duty Underwater Light

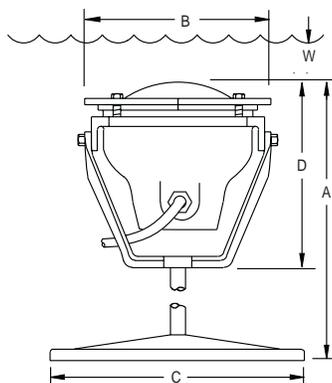
EL 100 series

Function

Heavy-duty underwater light using 1000 watt quartz halogen lamp for dramatic fountain effects. Fixture must be submerged while in operation.



ELB-100



ELC-100

Dimensions

DEFO no.	a dim.	b dim.	c dim.	d dim.	w dim.
ELB-100	9 ¹ / ₄ "	10 ¹ / ₂ "	8 ³ / ₄ "	7 ¹ / ₂ "	2"
ELC-100	12"	10 ¹ / ₄ "	12"	8 ³ / ₄ "	2"



Option P

Specification:

Construction of fixture and high-stability base shall be cast bronze with clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; porcelain mogul end prong PAR type socket; and stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

(Add suffix)
O - thermal cut off
P - hinged lens guard
Q - chromed top

Lens colour:

(Add suffix)
A - amber
R - red
B - blue
G - green
T - turquoise

Note:

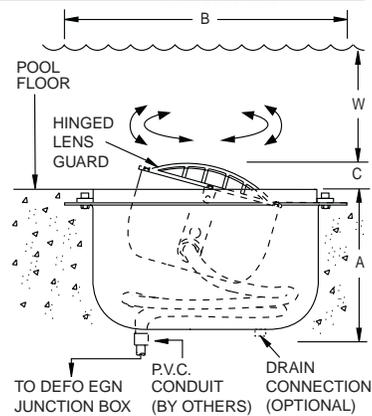
1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. T' foot base must always be fastened.
3. CSA and UL listed.
4. Lamps sold separately (see lamp selection chart on page 58).
5. Specify 'A' on ELC-100 if greater than 12". Contact factory for pricing.





ELD series

Deep Niche Underwater Light



Specification:

Construction of fixture, mounting clamp and lens guard shall be cast bronze. Deep niche shell shall be stainless steel, FRP or plastic moulded; and complete with stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible or 10/3 submersible for ELD-030 and ELD-040 series.

Options:

(Add suffix)
 D - 1/2" (12mm) drain connection
 O - thermal cut off
 Q - chromed surface parts

Lens colour:

(Add suffix)
 A - amber
 R - red
 B - blue
 G - green
 T - turquoise

Note:

1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. CSA and UL listed lights.
3. Lamps sold separately on ELD-020, ELD-050, ELD-100 (see lamp selection chart on page 58).

Function

Deep wet-niched underwater light fixture suitable for floor or wall mounted applications. Niche accommodates DEFO EL-020, EL-030, EL-040, EL-050, EL-100 series of lights. No exposed cords. Light swivels and may be tilted up to 20°. Supplied standard with hinged lens guard. Fixture must be submerged while in operation.

Dimensions

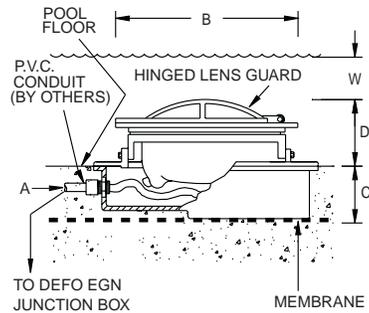
DEFO no.	a dim.	b dim.	c dim.	w dim.
ELD-015	8"	11 1/2"	2"	2"
ELD-020	8"	11 1/2"	2"	2"
ELD-030	8"	11 1/2"	2"	2"
ELD-040	8"	11 1/2"	2"	2"
ELD-050	9"	13"	2 1/2"	2"
ELD-100	9"	13"	2 1/2"	2"



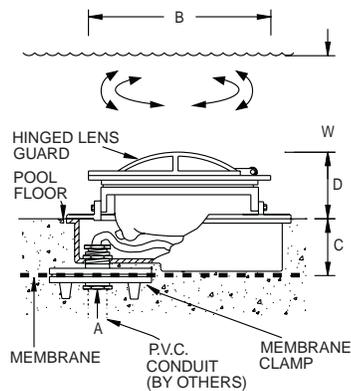
Shallow Niched Underwater Light

Function

This unique, low-profile DEFO underwater light fixture is supplied complete with fibreglass niche for recessed mounting in pool wall or floor. Niche is available with side or bottom connection. No exposed cords. Light swivels and may be tilted up to 20°. Supplied standard with hinged lens guard. Fixture must be submerged while in operation.



ELN-020



ELN-021

Dimensions

DEFO no.	a dim.	b dim.	c dim.	d dim.	w dim.
ELN-020	1 1/2"	9 1/2"	2 1/4"	3 1/2"	2"
ELN-021	1 1/2"	9 1/2"	2 1/4"	3 1/2"	2"



ELN

020-021

Specification:

Construction of fixture, mounting clamp and lens guard shall be cast bronze with DEFO round, concave, 'mirro'-chromed brass reflector; clear, convex, tempered, heat resistant, cast glass lens; U-shaped moulded gasket of approved material; S4 type porcelain socket; FRP moulded DEFO niche shell; and stainless steel fasteners. Cable shall be 9' (2.75 m), type 16/3 submersible.

ELN-021

When specifying model ELN-021 add: "Membrane clamps shall be cast bronze. Cord seal shall be brass DEFO 'EGN' compression type."

Options:

(Add suffix)
 O - thermal cut off
 Q - chromed surface parts

Lens colour:

(Add suffix)
 A - amber
 B - blue
 G - green
 R - red
 T - turquoise

Note:

1. Fixture must be installed by a qualified electrician and have ground fault protected circuitry.
2. CSA and UL listed.
3. Lamps sold separately (see lamp selection chart on page 58).

General Considerations for Lighting

General Considerations for Lighting

There are three important factors to be considered when selecting the number of fixtures and type of lamps to illuminate a fountain as follows:

1. Type of water effect to be illuminated:

- a) **Single Nozzles** – normally two fixtures per color with spot lamps
- b) **Spray Rings** – normally one fixture per color on 4' (1.2m) centres to 15' (5m) using wide flood lamps. For over 15' (3m) one fixture on 3' (1m) centres using medium flood lamps.

2. Colour Selection:

Various colours require different lighting intensities to achieve optimum levels, for instance:

- a) Amber and turquoise – requires 50% more light than clear.
- b) Red – requires 100% more light than clear.
- c) Blue and green – requires 250% more light than clear.

Example: A fountain jet requiring illumination to 9' (3m) using red lens will a lamp with light projection to 18' (6m) with clear lens. See chart below.

Note: High ambient light levels tend to wash out coloured lights. In such conditions it is suggested that clear, amber or turquoise colours be used.

3. Heights to be illuminated:

The following lamp selection chart outlines the recommended maximum heights and primary applications for available fixtures and lamps. Lamp life is shown and is an important factor in lamp selection.

Example: A 6000-hour lamp may initially cost twice as much as a 2000 lamp, but be more economical overall.

use with fixture no.	lamp order no.	primary applications type of effects	beam height	lamp life (hours)	watts	volts type	lamp type	beam
ELA-010	EQS-060 EQS-100	Reflecting surfaces and pool perimeters.		7500 8000	60 100	120 120	A-21 A-21	Flood Flood
ELA-015	EQS-150	Med. single jets	10' (3.0m)	6000	100	120	PAR-38Q	Spot
ELC-015	EQS-151	Low waterfalls, rings, bell jets	6' (1.8m)	6000	100	120	PAR-38Q	Flood
ELD-015	EQS-250	Med. single jets	15' (4.5m)	6000	250	120	PAR-38Q	Spot
	EQS-251	Med. waterfalls, rings, bell jets	8' (2.4m)	6000	250	120	PAR-38Q	Flood
ELA-020	EQS-155	Low waterfalls, rings, bell jets	5' (1.5m)	2000	150	120	MCQ	Flood
ELB-020	EQS-255	Med. waterfalls, rings, tulip jets	8' (2.4m)	2000	250	120	MCQ	Flood
ELC-020	EQS-505	Med. waterfalls, foam & cascade jets.	12' (3.6m)	2000	500	120	MCQ	Flood
ELN-020								
ELA-050	EQS-300Med. EQS-301	single jets & pods Med. rings, spheres, foam jets	25' (7.6m) 15' (4.5m)	2000 2000	300 300	120 120	PAR56Q PAR56	Spot Flood
ELB-050	EQS-302	Med. single jets & pods	25' (7.6m)	2000	300	12	PAR56Q	Flood
ELC-050	EQS-500	Large single jets	35' (11m)	4000	500	120	PAR56Q	Spot
ELD-050	EQS-501	Large rings, large foam & cascades	20' (6m)	4000	500	120	PAR56Q	Flood
ELB-100	EQS-600	Very large single jets	50' (15m)	4000	1000	120	PAR64Q	Spot
ELC-100								
ELD-100	EQS-601	Very large rings, jet pods	30' (9m)	4000	1000	120	PAR64Q	Flood

Contact Crystal Fountains regarding the availability of selected lamps in 24 or 220 volt. All lamps are subject to the availability from the manufacturer.

Note: Primary applications and beam heights (as shown) are based on the use of clear lens on fixtures located 2" (50mm) below the water surface.

Replacement Parts

Lens Rod Kit	
Part #	Use with Light Fixture
ELA010C60	ELA-010 Lens Rod Kit
Cable Seal Kits (Grommet, Washer & Nut Kit)	
Part #	Use with Light Fixture
ELSEALKIT015	EL-015/050/100 ELD-015/050/100
ELSEALKIT010	EL-010/020/025 ELD-020 ELN-020
ELSEALKIT030	EL-030/040 ELD-030/040
Lens Gaskets	
Part #	Use with Light Fixture
EL GASKET 4	EL-010
EL GASKET 1	EL-015/020 ELD-015/020 ELN-020/021
EL GASKET 5	EL-025
EL GASKET 3	EL-030/040 ELD-030/040
EL GASKET 2	EL-050/100 ELD-050/100
Cable Assemblies	
Part #	Use with Light Fixture
EL CORD 1 (PER FT)	16/3 STW CABLE (PER FT) EL-010/015/020/050/100
EL CORD 6 (PER FT)	14/3 H07RNF CABLE EL-030/040 EURO lights
EL CORD 5 (PER FT)	12/3 SOW CABLE (PER FT)
EL CORD 4 (PER FT)	10/3 SOW CABLE (PER FT) EL-030/040 UL approved

Lenses	
Part #	Use with Light Fixture
EL LENS 1C	EL-010
EL LENS 2C (clear)	EL-015/020/021/030/040 ELD-015/020/021/030/040 ELN-020/021
EL LENS 2 (coloured)	EL-015/020/021/030/040 ELD-015/020/021/030/040 ELN-020/021
EL LENS 3C (clear)	EL-050/100 ELD-050/100
EL LENS 3 (coloured)	EL-050/100 ELD-050/100
Reflectors	
Part #	Use with Light Fixture
ELA010C50	EL-010
ELA020C20	EL-020 ELD-020 ELN-020/021
ELA030C10	EL-030 ELD-030
ELA040C10	EL-040 ELD-040
Socket Kits	
Part #	Use with Light Fixture
EL SOCKET 1	EL-010/015 ELD-015
EL SOCKET 2	EL-020 ELD-020 ELN-020/021
EL SOCKET 7	EL-025 ELD-025
EL SOCKET 6	EL-030/040 ELD-030/040
EL SOCKET 3	EL-050/100 ELD-050/100



Cable Seal Kits



Cable Seal Kits



Lens Gaskets



Cable Assemblies



Lenses



Reflectors



Socket Kits

General Information For Lighting

Submerge fixtures before lighting.

All fixtures must be installed by a qualified electrician. Installation must meet NEC (National Electric Code) for safety.

Section 680-51 (a).
A ground-fault circuit-interrupter must be installed in the branch circuit supplying fountain equipment.

Section 680-51 (d).
This fixture must be protected by a low water level safety cut-off or other approved.

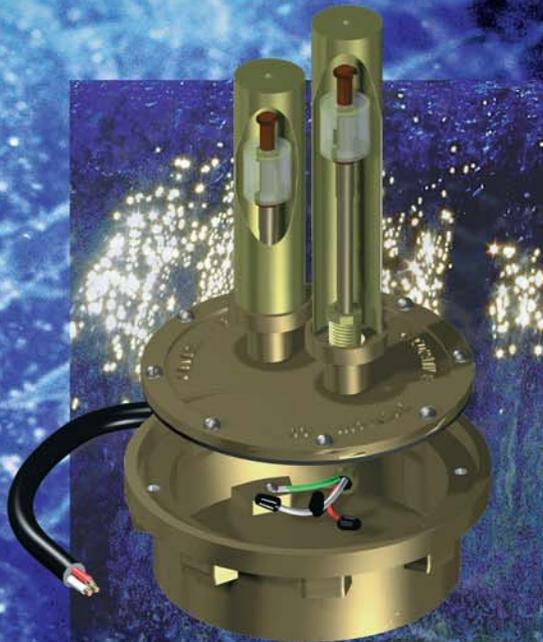
Lighting must be connected to a Class "A" GFCI (Ground Fault Circuit Interrupter).





Electrical

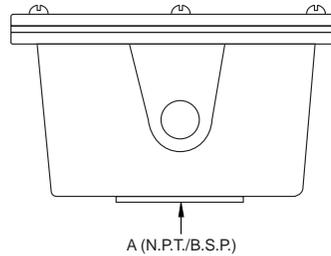
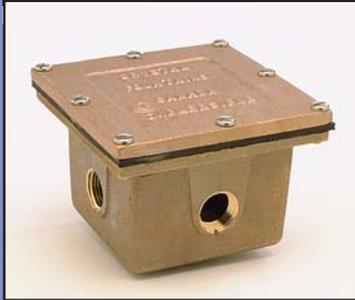
Product	Pg
EBJ Underwater Junction Boxes	62
EBN Underwater Junction Boxes	62
ECL Water Level Control Panels	63
ECW Wind Control Panel	63
EGN Junction Box Cord Seals	64
EGS Junction Box Cord Seals	64
EP Stub Ups	65
ESD Deck Mounted Level Sensors	66
ESF Conduit Mounted Level Sensors	66
ESG Conduit Mounted Level Sensors	67
ESL Adaptable Level Sensors	67
ESN Cast-In Level Sensors	68
ESO Electronic Level Control and Overflows	68
ESP Wall Mounted Level Sensors	69
ESS Moveable Level Sensors	69
ESW Wall Mounted Level Sensors	70





EBJ series

Underwater Junction Box



Specification:

Construction shall be cast bronze and equipped with neoprene cover gasket, stainless steel fasteners and internal ground connection.

Options:

(Add suffix)

J - junction box sealant (12 oz)

DEFO no.	inside cu. dim.	max. no. side outlets (npt/bsp)	a (npt) (bsp)	length dim.	width dim.	depth dim.
EBJ-202	11"	2	3/4"	4"	3 1/4"	3 1/4"
EBJ-204	22 1/2"	4	3/4"	4 1/2"	4 1/2"	3 3/4"
EBJ-208	40 3/4"	8	1"	5 1/2"	5 1/2"	3 1/2"
EBJ-212	65"	12	1 1/4"	5 1/2"	5 1/2"	4 1/2"
EBJ-216	137"	16	1 1/2"	7"	7"	5 1/2"
EBJ-220	170"	20	2"	8"	8"	5 1/2"

Function

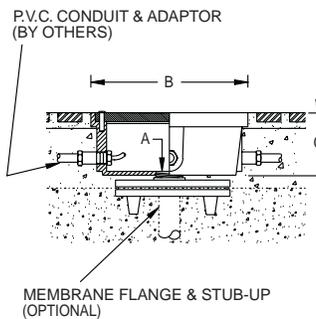
Submersible conduit mounted junction boxes for underwater connections.

Note:

1. Use only with brass conduit stub ups (see EPA stub up on page 65).
2. Use with brass compression cord seals (see EGS cord seals on page 64).
3. Seal junction box with junction box sealant (U.S. only).
4. CSA and UL listed.

EBN series

Underwater Junction Box



Specification:

Construction shall be cast bronze and equipped with neoprene cover gasket, stainless steel fasteners and internal ground connection.

Options:

(Add suffix)

C - side power connection
Q - chromed cover
J - junction box sealant (12 oz)

Dimensions

DEFO no.	inside cu. dim.	max. no. side outlets (npt/bsp)	a (npt) (bsp)	b dim.	c dim.
EBN-104	22 1/2"	4	3/4"	6 1/2"	2 1/2"

Function

Flush mounted underwater electrical junction box for poured-into-concrete applications. Most effective when set in 2 1/2" (58 mm) topping coat. Allows for connection of up to four underwater lights. Supplied standard with bottom conduit connection.

Note:

1. Use with brass compression cord seals (see EGN cord seals on page 64).
2. Seal junction box with junction box sealant (U.S. only).
3. CSA and UL listed.

Water Level Control Panel

Function

Panel implements the control functions which are monitored by the DEFO electronic water level sensors as follows:

Quick Fill Operation

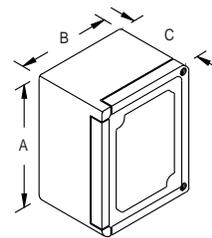
Energizes 24 volt solenoid actuated water supply valve required to sustain optimum operating water levels.

Safe-Off Operation

Shuts down all in-pool electrical functions during low or unsafe water level situations.

Maxi Level Control

Allows greater water level differentials between upper and lower operating levels. Utilizes two sensors instead of one in special situations; for example, wavy pools or multi-level applications which may temporarily incur unusual water displacements. This sensor may also be utilized to signal high water or flood conditions on indoor and upper level installations.



Dimensions

DEFO no.	a dim.	b dim.	c dim.
ECL-100	6 ¹ / ₄ "	6"	4 ¹ / ₄ "
ECL-200	6 ¹ / ₄ "	6"	4 ¹ / ₄ "
ECL-300	9 ¹ / ₄ "	7 ¹ / ₄ "	5"

ECL series

Options:

(Add suffix)

S - safe-off only
U - quick fill only
W- weatherproof enclosure

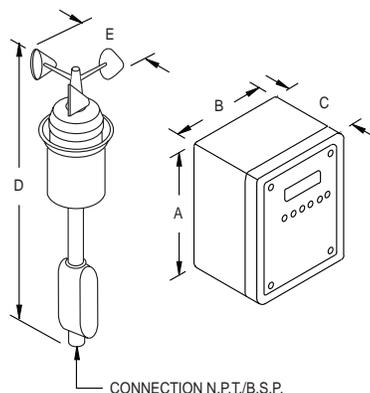
Note:

- ECL-100 (1 sensor) Quick Fill or Safe-Off (specify option S or U).
- ECL-200 (2 sensors) Quick Fill and Safe-Off.
- ECL-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.
- Specify operating voltage required.
- Contact factory for detailed specification, installation and operation details.

Wind Control Panel

Function

The DEFO wind control panel is a microprocessor based sentry that accurately senses wind velocity and adjusts the fountain controls to enable the system to continue to operate even in less than perfect conditions



Dimensions

DEFO no.	a dim.	b dim.	c dim.	d dim.	e dim.
ECW-100	6 ¹ / ₂ "	8"	5"	13 ¹ / ₄ "	6"

Features:

- LCD display
- adjustable wind speed set points
- multi mode operation
- dual sensor capability
- controls up to 4 relays
- memory backup

ECW series

Specification:

Control panel housing shall be plastic nema 4X rated. Wind anemometer shall have a plastic sensing head, rubber boot enclosure and copper and aluminum stem. Cable supplied shall be 300' (90 m) length.

Electrical Rating:

Line Voltage 120V/60Hz or 220/240V, 50Hz. 1 amp

Note:

Contact factory for detailed specification, installation and operation details.



EGN series

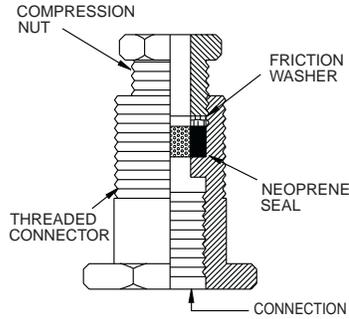
Junction Box Cord Seal

Specification:

Construction of DEFO threaded connector, compression nut and friction washer shall be brass with neoprene compression seal.

Note:

Must be installed by a qualified electrician according to local electrical codes.

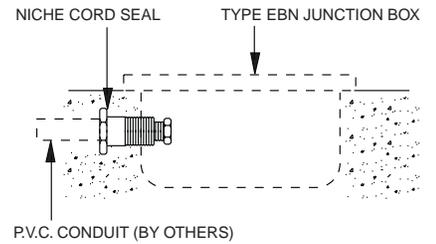


Function

Compression cord seal for use with DEFO 'EBN' flush mounted junction box. Provides water-tight connection of underwater cables connecting junction boxes with lights.

Dimensions

DEFO no.	conn. (npt) (bsp)	awg type	cable size	
			inches	mm.
EGN-075	1/2"	16/3	.400"	10.2



EGS series

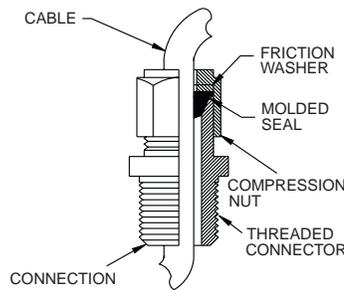
Junction Box Cord Seal

Specification:

Construction of threaded connector, compression nut and friction washer shall be brass with neoprene DEFO moulded compression seal.

Note:

Must be installed by a qualified electrician according to local electrical codes.

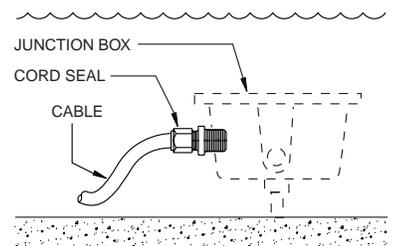


Function

For watertight connections of underwater cables connecting junction boxes with lights, water level sensors and pumps.

Dimensions

DEFO no.	conn. (npt) (bsp)	awg type	cable size	
			inches	mm.
EGS-052	1/2"	16/3	.350" - .435"	
EGS-071	3/4"	14/3	.375" - .500"	
EGS-073	3/4"	12/4	.500" - .625"	
EGS-074	3/4"	10/3	.625" - .750"	

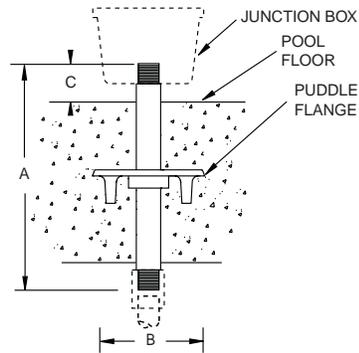


Stub Up

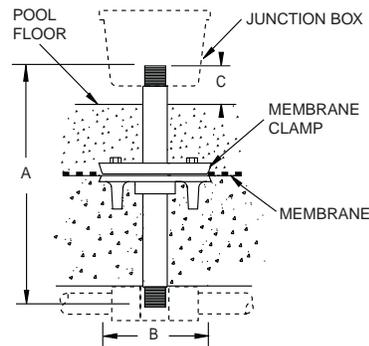
EP series

Function

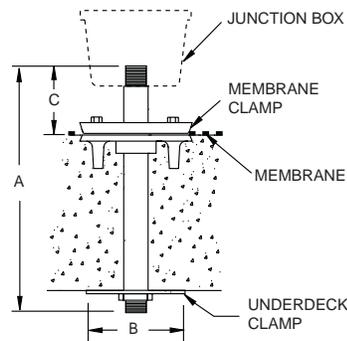
Flanged bronze conduit stub ups are leak-proof and strong. Stub ups provide watertight and secure penetrations through concrete and membranes directly into fountain pools. Use as terminal connectors with DEFO 'EBJ' bronze underwater junction boxes.



EPA - No Membrane Application



EPB - Sub Surface Membrane Application



EPC - Cored Hole Application



Dimensions

DEFO no.	pipe dia.	a dim.	b dim.	c dim.
EPA-075		12"		
EPB-075	3/4"	12"	4 1/2"	2"
EPC-075		14"		
EPA-100		12"		
EPB-100	1"	12"	4 1/2"	2"
EPC-100		14"		
EPA-125		12"		
EPB-125	1 1/4"	12"	4 1/2"	2"
EPC-125		14"		
EPA-150		12"		
EPB-150	1 1/2"	12"	4 1/2"	2"
EPC-150		14"		
EPA-200		12"		
EPB-200	2"	12"	4 1/2"	2"
EPC-200		14"		

Specification:

Construction of DEFO stub up pipe shall be red brass with cast bronze flange soldered to pipe and stainless steel fasteners.

Notes:

Contact factory for customized lengths.



ESD series

Deck Mounted Level Sensor

Specification:

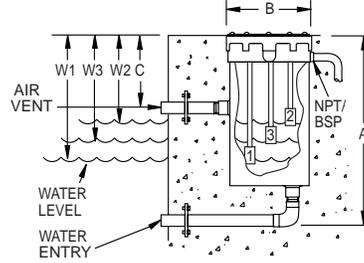
Construction shall be cast bronze, brass, copper and stainless steel fitted. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

Options:

(Add suffix)
Q - chromed cover

Note:

- ESD-100 (1 sensor) Quick Fill or Safe-Off.
- ESD-200 (2 sensors) Quick Fill and Safe-Off.
- ESD-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.



1. QUICK FILL OR SAFE OFF SENSOR
2. QUICK FILL SENSOR
3. MAXI-LEVEL SENSOR

Function

Deck mounted electronic water level sensor automatically monitors quick fill and safe-off functions. Water entry and air vent tubes extend through pool wall. Top access facilitates final float adjustment. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63).

Dimensions

DEFO no.	electrical connection (npt/bsp)	a dim.	b dim.	c dim.	w1 dim.	w2 dim.	w3 dim.
ESD-100	1/2"	14 1/2"	6 1/2"	5 3/4"	10"		
ESD-200	1/2"	14 1/2"	6 1/2"	5 3/4"	10"	7 3/4"	
ESD-300	1/2"	14 1/2"	6 1/2"	5 3/4"	10"	7 3/4"	8 3/4"

ESF series

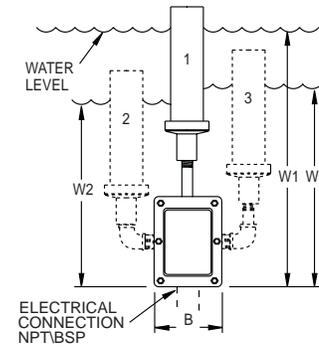
Conduit Mounted Level Sensor

Specification:

Construction of sensor enclosure shall be cast bronze and brass with DEFO neoprene moulded seal and gasket. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

Note:

- ESF-100 (1 sensor) Quick Fill or Safe-Off.
- ESF-200 (2 sensors) Quick Fill and Safe-Off.
- ESF-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.
- Custom sizes available upon request



1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR
3. MAXI-LEVEL SENSOR

Function

Conduit mounted electronic water level sensor automatically monitors quick fill and safe-off functions. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63).

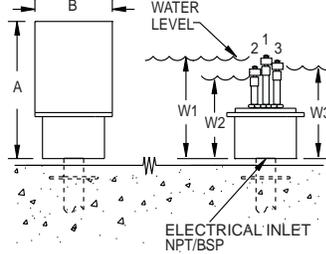
Dimensions

DEFO no.	inlet (npt/bsp)	a dim.	b dim.	w1 dim.	w2 dim.	w3 dim.
ESF-100	3/4"	11 1/2"	3 1/4"	10"		
ESF-200	3/4"	11 1/2"	4 1/2"	10"	8"	
ESF-300	3/4"	11 1/2"	4 1/2"	10"	8"	9"

Conduit Mounted Level Sensor

Function

Conduit mounted electronic water level sensor automatically monitors quick fill and safe-off functions. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63). Install vertically.



1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR
3. MAXI-LEVEL SENSOR



Dimensions

DEFO no.	electrical connection (npt/bsp)	a dim.	b dim.	w1 dim.	w2 dim.	w3 dim.
ESG-100	3/4"	9"	4 1/2"	8 1/2"		
ESG-200	3/4"	9"	4 1/2"	8 1/2"	6 1/2"	
ESG-300	3/4"	9"	4 1/2"	8 1/2"	6 1/2"	7 1/4"

ESG series

Specification:

Construction of body and cover shall be extruded plastic; brass, copper and stainless steel fitted with neoprene gasket and seal. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

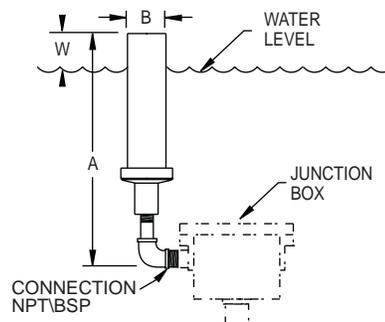
Note:

1. ESG-100 (1 sensor) Quick Fill or Safe-Off
2. ESG-200 (2 sensors) Quick Fill and Safe-Off.
3. ESG-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.

Adaptable Level Sensor

Function

The ESL water level sensor is adaptable to most junction boxes for varied applications and conditions. Sensors can be used for quick fill and/or safe-off functions on pools where level controls either were not provided or are no longer functional. Connects to DEFO 'ECL' control panel (see page 63).



Dimensions

DEFO no.	electrical connection (npt/bsp)	a dim.	b dim.	w dim.
ESL-100	1/2"	9 1/2"	1 1/2"	2"



ESL series

Specification:

Construction of sensor enclosure shall be bronze and brass with neoprene moulded seal. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12 VAC 0.5 Amp. Non-inductive.

Note

1. Custom sizes available upon request



ESN series

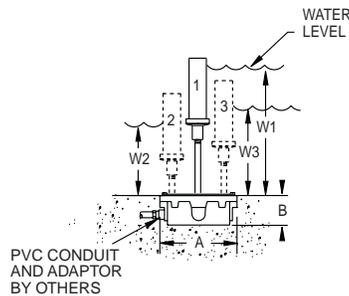
Cast-In Level Sensor

Specification:

Construction of sensor box and lid cover shall be cast bronze. DEFO sensor enclosure shall be brass and copper with neoprene gasket and seal. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

Options:

(Add suffix)
Q - chromed top



1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR
3. MAXI-LEVEL SENSOR

Function

Cast-in electronic water level sensor automatically monitors quick fill and safe-off functions in very shallow water depths. Sensor is adjustable in height after installation. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63). Install vertically.

Dimensions

DEFO no.	electrical connection (npt/bsp)	a dim.	b dim.	w1 dim.	w2 dim.	w3 dim.
ESN-100	1/2"	6 1/2"	2 1/2"	10"		
ESN-200	1/2"	6 1/2"	2 1/2"	10"	8"	
ESN-300	1/2"	6 1/2"	2 1/2"	10"	8"	9"

Note:

1. ESN-100 (1 sensor) Quick Fill or Safe-Off.
2. ESN-200 (2 sensors) Quick Fill and Safe-Off.
3. ESN-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.
4. Custom sizes available upon request

ESO series

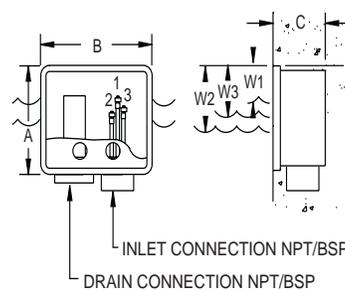
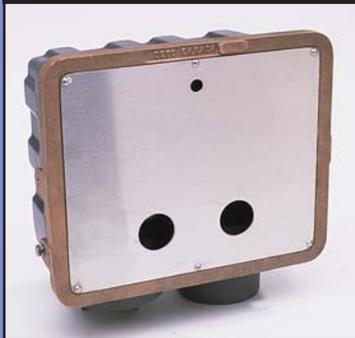
Electronic Level Control and Overflow

Specification:

Construction shall be cast bronze frame with DEFO impact resistant stainless steel cover and moulded plastic enclosure. Overflow drain assembly shall be brass, copper and extruded plastic fitted. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

Options:

(Add suffix)
Q - chromed frame
V - vandal resistant fasteners and wrench kit
B - brass cover plate



1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR
3. MAXI-LEVEL SENSOR

Function

Flush, wall mounted, combination electronic water level controller and overflow drain. Automatically monitors quick fill and safe-off functions, and drains overflow water through a built-in drain. Integral adjustments on level sensors and stand-pipe facilitate adjustments after installation. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63).

Note:

1. ESO-100 (1 sensor) Quick Fill or Safe-Off.
2. ESO-200 (2 sensors) Quick Fill and Safe-Off.
3. ESO-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.

Dimensions

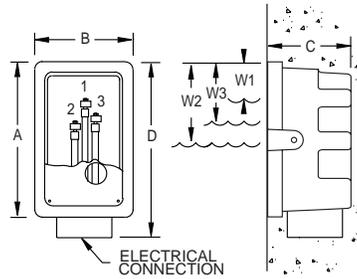
DEFO no.	electrical connection (npt/bsp)	drain connection (npt/bsp)	a dim.	b dim.	c dim.	w1 dim.	w2 dim.	w3 dim.
ESO-100	3/4"	3"	10"	12"	5 3/4"	2 1/2"		
ESO-200	3/4"	3"	10"	12"	5 3/4"	2 1/2"	4 1/2"	
ESO-300	3/4"	3"	10"	12"	5 3/4"	2 1/2"	4 1/2"	3 1/2"



Wall Mounted Level Sensor

Function

Flush, wall mounted, electronic water level sensor automatically monitors quick fill and safe-off functions. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63).



1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR
3. MAXI-LEVEL SENSOR



ESP series

Specification:

Construction shall be cast bronze frame with DEFO impact resistant stainless steel cover and moulded plastic enclosure. Brass and stainless steel fitted. Gasket and seal shall be neoprene. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

Options:

(Add suffix)
 Q - chromed frame
 V - vandal resistant fasteners and wrench kit
 B - brass cover plate

Dimensions

DEFO no.	electrical connection (npt/bsp)	a dim.	b dim.	c dim.	d dim.	w1 dim.	w2 dim.	w3 dim.
ESP-100	3/4"	10 1/4"	6 1/2"	5 1/4"	12 1/4"	2"		
ESP-200	3/4"	10 1/4"	6 1/2"	5 1/4"	12 1/4"	2"	4"	
ESP-300	3/4"	10 1/4"	6 1/2"	5 1/4"	12 1/4"	2"	4"	3"

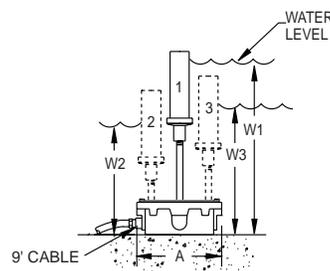
Note:

1. ESP-100 (1 sensor) Quick Fill or Safe-Off.
2. ESP-200 (2 sensors) Quick Fill and Safe-Off.
3. ESP-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.

Moveable Level Sensor

Function

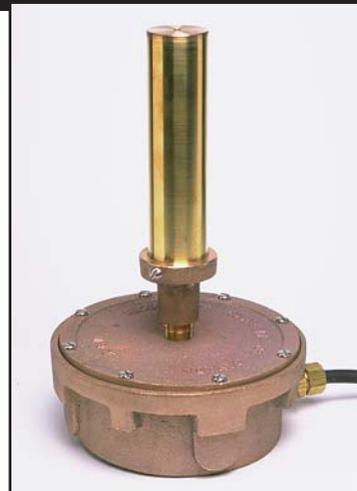
Moveable DEFO electronic water level sensor automatically monitors quick fill and safe-off functions in very shallow water depths. Sensor is adjustable in height after installation. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63). Install vertically.



1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR
3. MAXI-LEVEL SENSOR

Dimensions

DEFO no.	a dim.	w1 dim.	w2 dim.	w3 dim.
ESS-100	6 1/2"	10"		
ESS-100	6 1/2"	10"	8"	
ESS-300	6 1/2"	10"	8"	9"



ESS series

Specification:

Construction of DEFO sensor box and lid shall be cast bronze with neoprene gasket and seals. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive. Cable shall be 9' (2.75 m), type 16/3 submersible.

Options:

(Add suffix)
 Q - chromed top

Note:

1. ESS-100 (1 sensor) Quick Fill or Safe-Off.
2. ESS-200 (2 sensors) Quick Fill and Safe-Off.
3. ESS-300 (3 sensors) Quick Fill, Safe-Off and Maxi Level Control.
4. Custom sizes available upon request.



ESW series

Wall Mounted Level Sensor

Specification:

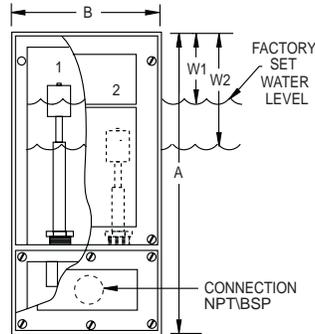
Construction of DEFO sensor box, lid, junction box and cover shall be cast bronze with neoprene gasket and seals. Level switch shall be reed relay enclosed in a plastic, magnetically actuated float with 1" (25mm) level adjustment. Voltage: 12VAC 0.5 Amp. Non-inductive.

Options:

(Add suffix)
D - bottom connection
Q - chrome covers
Y - subsurface flange
Z - membrane clamp

Note:

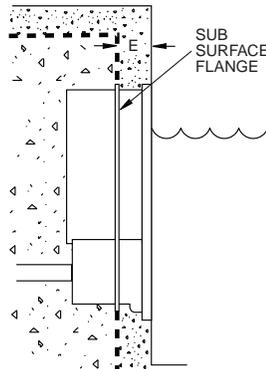
1. ESW-100 (1 sensor) Quick Fill or Safe-Off.
2. ESW-200 (2 sensors) Quick Fill and Safe-Off.



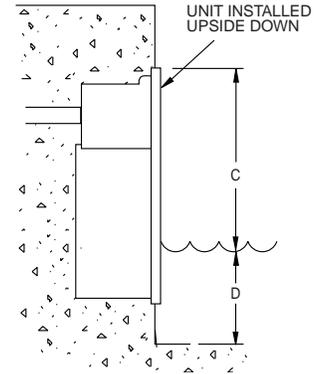
1. QUICK FILL OR SAFE OFF SENSOR
2. SAFE-OFF SENSOR

Function

Flush, wall mounted, electronic water level sensor automatically monitors quick fill and safe-off functions. May be mounted upside down for shallow applications. Standard with back connection. Low voltage for safety. Connects to DEFO 'ECL' control panel (see page 63).



Sub Surface Flange Application



Low Water Depth Application

Dimensions

DEFO no.	electrical connection (npt/bsp)	a dim.	b dim.	c dim.	d dim.	e dim.		w1 dim.	w2 dim.
						min.	max.		
ESW-100	1/2"	10"	4 ³ / ₄ "	7 ¹ / ₂ "	2 ¹ / ₂ "	1"	2"	2 ¹ / ₂ "	
ESW-200	1/2"	10"	4 ³ / ₄ "	7 ¹ / ₂ "	2 ¹ / ₂ "	1"	2"	2 ¹ / ₂ "	3 ¹ / ₄ "

Replacement Parts

EGS-Cord Seals

(Grommet, Washer & Nut Kit)

Part #	Use with Item
EL SEAL KIT 015	EGS-052
EL SEAL KIT 010	EGN-075
EL SEAL KIT 071	EGS-071/073
EL SEAL KIT 074	EGS-074

Junction Box Gaskets

Part #	Use with Item
EBN104C30	EBN104
EBJ202C30	EBJ202
EBJ204C30	EBJ204
EBJ208C30	EBJ208/212
EBJ216C30	EBJ216
EBJ220C30	EBJ220

Junction Box Potting Compound

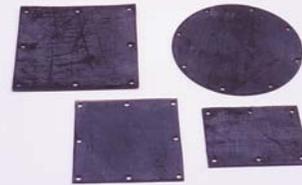
EBJC10	21oz
--------	------

Water Level Sensors

Part #	Description
ES C40	Gem Sensor Float Switch
EL SEAL KIT 010	Grommet, Washer & NutKit
ES C50	Brass Stem
ES C15	Brass Shroud
ESWC45	Cover Gasket (2)-ESW
EBN104C30	Cover Gasket-
ESD/ESN/ESS	Cover Gasket-ESF
EBJ202C30	Cover Gasket-ESF
AWOC70	Vandal Resistant Driver Kit



EGS-Cord Seals



Junction Box Gaskets



Junction Box Potting Compound



Water Level Sensors



Vandal Resistant Driver Kit

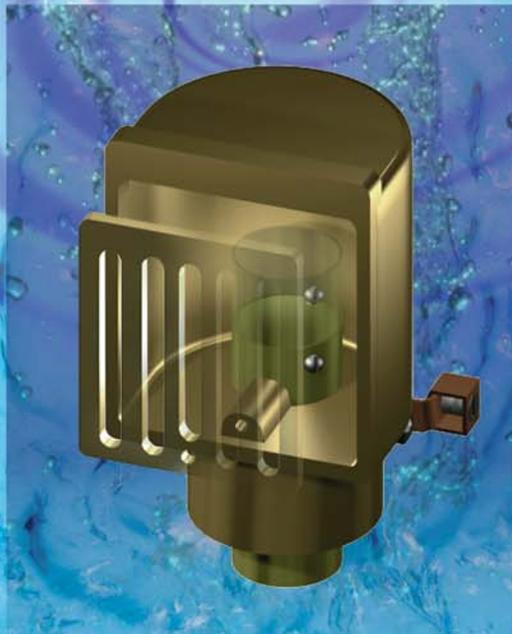
General Information For Electrical

Standard Threading:

Standard threading on DEFO components shall be National Pipe Thread (NPT) unless requested otherwise at the time of order. All thread sizes less than 1" will be NPT.



Drains & Inlets



Product	Pg	
DOA	Overflow Drains	74
DOF	Overflow Drains	74
DOL	Overflow Drain	75
DOW	Overflow Drains	75
DPA	Outlet Drains	76
DPB	Outlet Drains	76
DSA	Suction Drains	77
DSC	Suction Drains	77
DSF	Suction Drains	78
DSL	Suction Drains	78
DTG	Floor Drains	79
DTS	Threaded Sleeve Fittings	79
DUS	Sleeve Fittings	80
DUT	Sleeve Fittings	80
IEA	Inlet Fittings	81
IEB	Inlet Fittings	81
IFA	Inlet Fittings	82
IFC	Inlet Fittings	82
IFF	Inlet Fittings	83
IFS	Sleeve Fittings	83



DOA series

Overflow Drain

Specification:

Construction of DEFO combination overflow and pool drain body with reversible clamp collar, adjustable extension, tapered watertight slip connection and vented dome shall be cast bronze with copper standpipe and stainless steel fasteners.

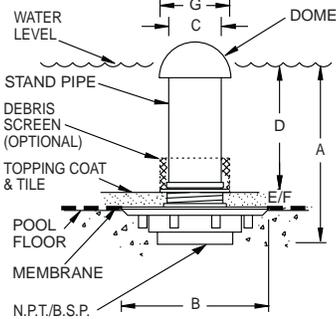
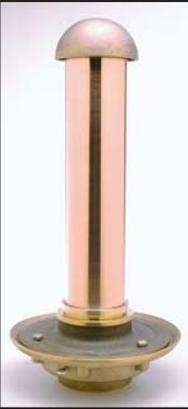
Options:

(Add suffix)

D - debris screen
Q - chrome plated dome
S - stand pipe greater than 18"

U - underdeck clamp

W - winter plug



Function

Combination overflow and pool drain. Excess water overflows into standpipe. Slip connection on standpipe facilitates removal for draining.

Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	e dim. max.	f dim. min.	g dim.
DOA-200	2"	21 ³ / ₄ "	6 ¹ / ₂ "	2"	18"	2 ¹ / ₂ "	1 ³ / ₄ "	3 ¹ / ₄ "
DOA-300	3"	21 ³ / ₄ "	8 ⁵ / ₄ "	3"	18"	2 ¹ / ₈ "	1 ¹ / ₂ "	4 ¹ / ₄ "
DOA-400	4"	21 ³ / ₄ "	9"	4"	18"	2 ¹ / ₄ "	1 ¹ / ₂ "	5 ¹ / ₄ "

DOF series

Overflow Drain

Specification:

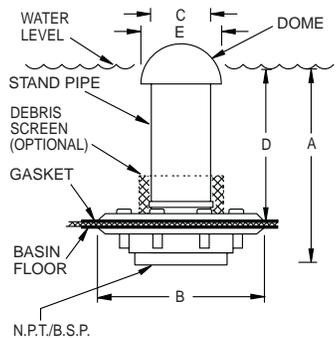
Construction of DEFO combination overflow and pool drain body with pressure ring, tapered watertight slip connection and vented dome shall be cast bronze with copper standpipe, neoprene rubber gasket seal and stainless steel fasteners.

Options:

(Add suffix)

D - debris screen
Q - chrome plated dome
S - stand pipe greater than 18"

W - winter plug



Function

Combination overflow and pool drain **for non-corrosive fabricated basins, troughs or reservoirs**. Excess water overflows into standpipe. Slip connection on standpipe facilitates removal for draining fabricated basins.

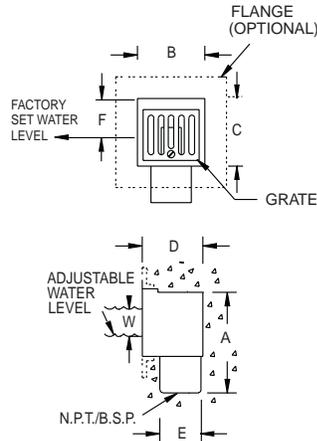
Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	e dim.
DOF-200	2"	21"	5 ³ / ₄ "	2"	19"	3 ¹ / ₄ "
DOF-300	3"	21"	7 ³ / ₄ "	3"	19 ³ / ₄ "	4 ¹ / ₄ "

Overflow Drain

Function

Light duty, wall mounted overflow drain regulates water level. Excess water spills over adjustable weir. Single screw adjusts DEFO overflow tube to desired level after installation.



Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	e dim.	f dim.	w dim. max.
DOL-150	1 1/2"	5 1/4"	3 1/4"	3 3/4"	3 1/4"	2"	1 1/2"	1 1/2"

DOL series

Specification:

Construction of DEFO wall mounted and adjustable overflow drain body and grate shall be cast bronze with copper overflow stand-pipe, neoprene rubber seal ring and stainless steel fasteners.

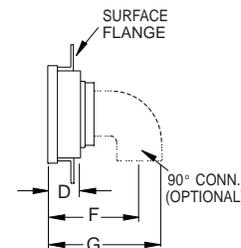
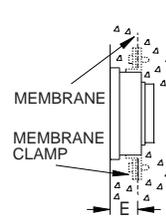
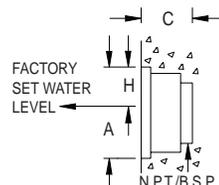
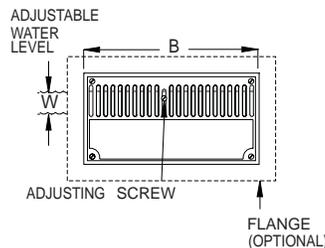
Options:

(Add suffix)
 K - surface flange
 L - membrane clamp
 Q - chrome plated

Overflow Drain

Function

Heavy-duty, wall mounted overflow drain regulates water level. Excess water spills over adjustable weir. Single screw adjusts DEFO weir plate to desired level after installation.



Option L

Option K

Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.		e dim.		f dim.	g dim.	h dim.	w dim.
					min.	max.	min.	max.				
DOW-300	3"	6 1/4"	12"	2 1/2"	1 1/4"	2"	1 1/4"	2"	4 3/4"	6 3/4"	2"	1 1/4"
DOW-400	4"	6 1/4"	12"	2 1/2"	1 1/4"	2"	1 1/4"	2"	5 3/4"	7 1/4"	2"	1 1/4"

DOW series

Specification:

Construction of DEFO wall mounted and adjustable overflow drain body and grate shall be cast bronze with stainless steel DEFO adjustable weir plate, neoprene watertight gasket and stainless steel fasteners.

Options:

(Add suffix)
 E - open grate
 (no adjustment)
 K - surface flange
 L - membrane clamp
 M - 90° solder elbow
 Q - chrome plated
 W - winter cover



DPA series

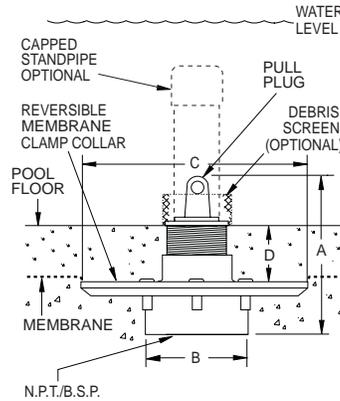
Outlet Drain

Specification:

Construction of pool drain body, reversible clamp collar, adjustable extension and pull plug with DEFO tapered watertight slip connections shall be cast bronze with stainless steel fasteners.

Options:

- (Add suffix)
- D - debris screen
- P - capped standpipe
- U - underdeck clamp
- W - winter plug



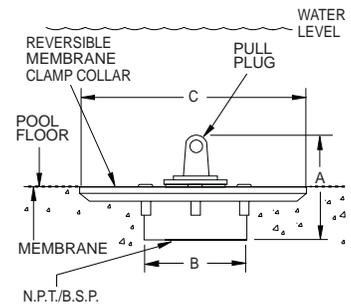
Topping Coat Application

Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim. max.
DPA-200	2"	6 ³ / ₄ "	3 ¹ / ₂ "	7"	2 ¹ / ₂ "
DPA-300	3"	7 ³ / ₄ "	4"	9"	2"
DPA-400	4"	8 ³ / ₄ "	5"	9"	2 ¹ / ₂ "

Function

Outlet drain for draining pools. Plug has slip connection for easy removal. Reversible membrane clamp collar permits the drain to be used on pools with surface applied or topping coat required membranes.



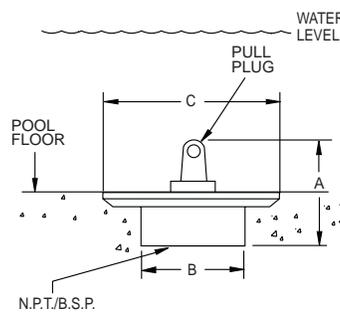
Surface Applied Membrane Application

DPB series

Outlet Drain

Specification:

Construction of pool drain body and pull plug with DEFO tapered slip connections shall be cast bronze.



Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.
DPB-200	2"	3 ¹ / ₂ "	3 ¹ / ₂ "	6 ¹ / ₂ "
DPB-300	3"	5"	4"	6 ¹ / ₂ "
DPB-400	4"	5 ¹ / ₄ "	5"	6 ¹ / ₂ "

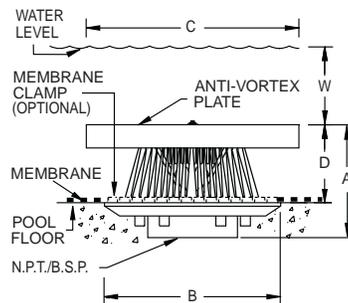
Function

Outlet drain for draining pools. Plug has slip connection for easy removal. Ideal for applications that do not require waterproofing membranes and clamp collars.

Suction Drain

Function

Pump suction drain for concrete pools. DEFO strainer intercepts debris. Anti-vortex plate prevents air entrainment.



Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	w dim. min.	strainer free area sq. in.
DSA-200	2"	5 1/4"	6 1/2"	8"	3 1/2"	3"	22"
DSA-300	3"	6 1/2"	9"	12"	4"	4"	47"
DSA-400	4"	6 1/2"	9"	12"	4"	8"	47"
DSA-600	6"	6 1/2"	12"	16"	4"	10"	81"
DSA-800	8"	10"	14"	16"	7"	10"	150"

DSA series

Specification:

Construction of DEFO suction drain body and secured strainer shall be cast bronze with DEFO opti-bronze textured FRP anti-vortex plate and stainless steel fasteners. "Maxi-flo" strainer shall be low profile and inverted cone shaped.

Options:

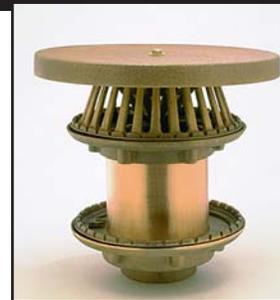
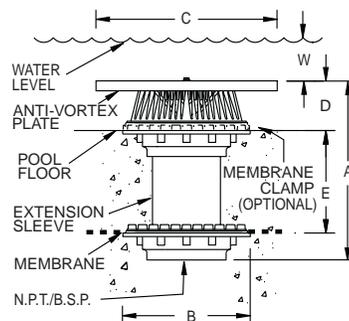
(Add suffix)

- A - adjustable flow regulator
- C - cast bronze anti-vortex plate
- D - fine mesh screen
- G - flat grate
- L - membrane clamp
- U - underdeck clamp
- V - FRP square anti-vortex plate
- Y - FRP square anti-vortex plate, recessed for tiles

Suction Drain

Function

Pump suction drain for concrete pools with multiple slab penetrations. DEFO strainer intercepts debris. Anti-vortex plate prevents air entrainment.



Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	e dim. min.	w dim. min.	strainer free area sq. in.
DSC-200	2"	7"	6 1/2"	8"	3 1/2"	1 1/4"	3"	22"
DSC-300	3"	8"	9"	12"	4"	1 1/2"	4"	47"
DSC-400	4"	8"	9"	12"	4"	1 1/2"	8"	47"
DSC-600	6"	14"	12"	16"	4"	2"	10"	81"
DSC-800	8"	16"	14"	16"	7"	2"	10"	150"

Options:

(Add suffix)

- A - adjustable flow regulator
- C - cast bronze anti-vortex plate
- D - fine mesh debris strainer
- G - flat grate
- L - membrane clamp
- U - underdeck clamp
- V - FRP square anti-vortex plate
- Y - FRP square anti-vortex plate, recessed for tiles

DSC series

Specification:

Construction of DEFO suction drain body and secured strainer, membrane clamp and extension body shall be cast bronze with DEFO opti-bronze textured FRP anti-vortex plate, non-corrosive extension sleeve and stainless steel fasteners. "Maxi-flo" strainer shall be low profile and inverted cone shaped.



DSF series

Suction Drain

Specification:

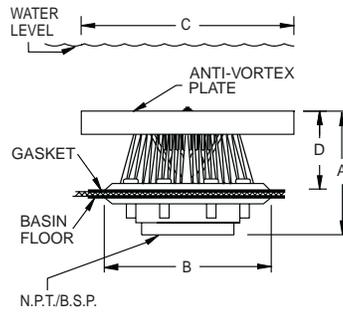
Construction of suction drain body and secured "Maxi-flo" domed strainer shall be cast bronze with neoprene gasket seal, DEFO opti-bronze textured FRP anti-vortex plate and stainless steel fasteners.

Options:

(Add suffix)
 A - adjustable flow regulator
 C - cast bronze anti-vortex plate

Note:

DSF series is designed for use with non-corrosive fabricated basins, troughs and reservoirs only.



Function

Suction drain for fabricated basins. DEFO strainer intercepts debris. Anti-vortex plate prevents air entrainment.

Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	strainer free area sq. in.
DSF-200	2"	3 1/2"	6"	8"	2 1/2"	22"
DSF-300	3"	4 1/2"	8"	12"	3"	47"

DSL series

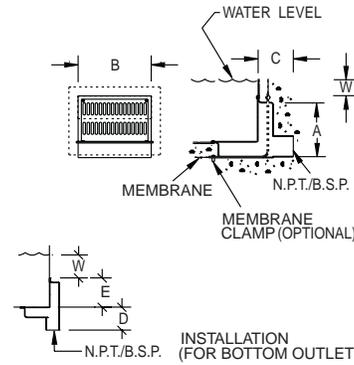
Suction Drain

Specification:

Construction of DEFO drain body, fasteners, flanges and clamps shall be stainless steel with brass grate.

Options:

(Add suffix)
 K - surface flange
 L - membrane clamp
 Q - chrome plated grate
 V - anti-vortex plate
 W - winter cover



Function

Suction or main drain for concrete pools to handle medium to large volumes of return water. When installed in side outlet mode, it allows for suction line installation at minimum depth.

Dimensions

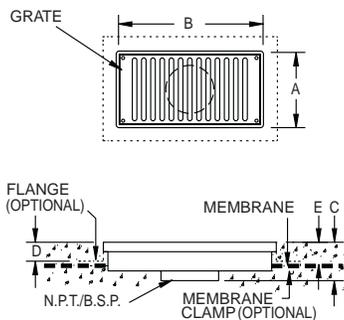
DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	e dim.	w dim. min.	strainer free area sq. in.
DSL-200	2"	9"	12"	4 3/4"	4 3/4"	6 1/2"	6"	35"
DSL-300	3"	9"	12"	4 3/4"	4 3/4"	6 1/2"	8"	35"
DSL-400	4"	9"	12"	4 3/4"	4 3/4"	6 1/2"	12"	35"
DSL-600	6"	9"	12"	4 3/4"	4 3/4"	6 1/2"	15"	35"

*Mechanical joint only.

Floor Drain

Function

General-purpose floor drain. Ideal for troughs and gutters.



Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.		e dim.	
					min.	max.	min.	max.
DTG-300	3"	6 ¹ / ₄ "	12"	2 ¹ / ₂ "	1 ¹ / ₄ "	2"	1 ¹ / ₄ "	2"
DTG-400	4"	6 ¹ / ₄ "	12"	2 ¹ / ₂ "	1 ¹ / ₄ "	2"	1 ¹ / ₄ "	2"

DTG series

Specification:

Construction of DEFO drain body and heavy-duty grate shall be cast bronze with stainless steel fasteners.

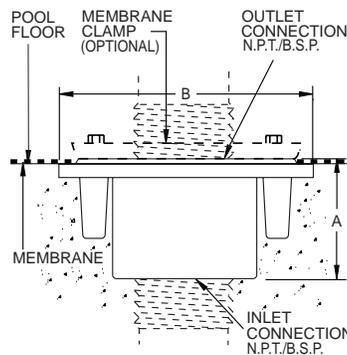
Options:

(Add suffix)
 K - surface flange
 L - membrane clamp
 W - winter cover

Threaded Sleeve Fitting

Function

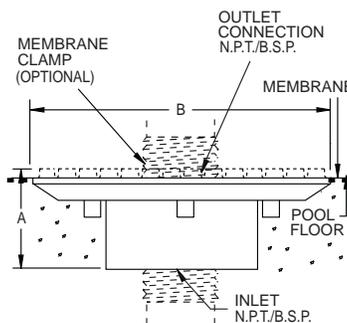
Threaded sleeve fitting facilitates watertight penetrations through concrete slabs for supply and drain lines.



DTS -075/100/125/150

Dimensions

DEFO no.	inlet/outlet (npt) (bsp)	a dim.	b dim.
DTS-075	3/4"	2 ¹ / ₄ "	5"
DTS-100	1"	2 ¹ / ₄ "	5"
DTS-125	1 ¹ / ₄ "	2 ¹ / ₄ "	5"
DTS-150	1 ¹ / ₂ "	2 ¹ / ₄ "	5"
DTS-200	2"	2 ¹ / ₄ "	6 ¹ / ₂ "
DTS-300	3"	2 ³ / ₄ "	9"
DTS-400	4"	2 ³ / ₄ "	9"



DTS -200/300/400

DTS series

Specification:

Construction of DEFO sleeve fitting shall be cast bronze with stainless steel fasteners.

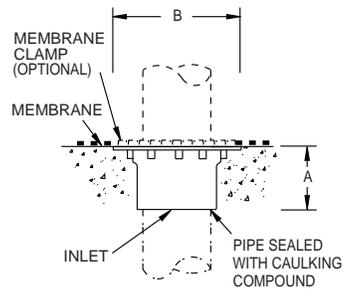
Options:

(Add suffix)
 L - membrane clamp
 U - underdeck clamp



DUS series

Sleeve Fitting



Function

Sleeve for drains and inlet lines into concrete pools; provides watertight penetration of decks, membranes and finished pool floor. **Ideal for plastic extruded pipe.**

Specification:

Construction of DEFO sleeve body shall be cast bronze with stainless steel fasteners.

Options:

(Add suffix)

- L - membrane clamp
- U - underdeck clamp

Note:

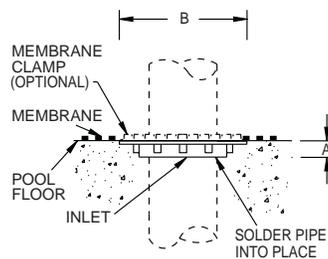
Use silicon rubber or PC4 cement compounds to join body to sleeve.

Dimensions

DEFO no.	inlet	a dim.	b dim.
DUS-300	3"	4"	9"
DUS-400	4"	4"	9"
DUS-600	6"	4"	12"
DUS-800	8"	4 1/4"	14"

DUT series

Sleeve Fitting



Function

Sleeve for drains and inlet lines into concrete pools; provides watertight penetration of decks, membranes and finished pool floor. **For copper or brass pipe only.**

Specification:

Construction of DEFO sleeve body shall be cast bronze with stainless steel fasteners.

Options:

(Add suffix)

- L - membrane clamp
- U - underdeck clamp

Note:

Use silver solder to join fitting to sleeve.

Dimensions

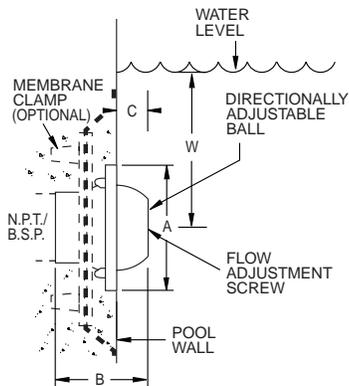
DEFO no.	inlet	a dim.	b dim.
DUT-200	2"	1 1/2"	7"
DUT-300	3"	1 1/2"	9"
DUT-400	4"	1 1/2"	9"

Inlet Fitting

IEA series

Function

Precision engineered for heavy-duty fountain use. Adjustable eyeball filter return for pool recirculation. External adjustment makes flow regulation and balancing easy.



Specification:

Construction of DEFO inlet body, pressure ring, ball and adjustable DEFO poppet valve shall be cast bronze with neoprene pressure 'O' ring gasket and stainless steel fasteners.

Options:

(Add suffix)
 K - surface flange
 L - membrane clamp
 Q - chromed
 W - winter cover

Dimensions

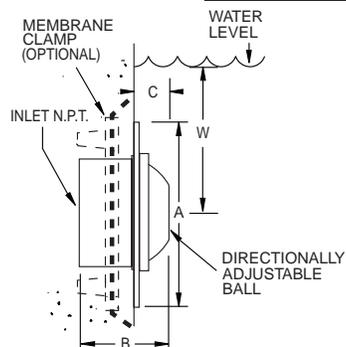
DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	w dim. min.
IEA-150	1 1/2"	4"	2 3/4"	3/4"	6"

Inlet Fitting

IEB series

Function

A directionally adjustable eyeball filter return for pool recirculation without flow regulator.



Specification:

Construction of inlet body, lock ring and ball shall be bronze with chromed finish.

Options:

(Add suffix)
 K - surface flange
 L - membrane clamp

Dimensions

DEFO no.	inlet (npt)	a dim.	b dim.	c dim.	w dim. min.
IEB-150	1 1/2"	2 3/4"	2	3/4"	6"



IFA series

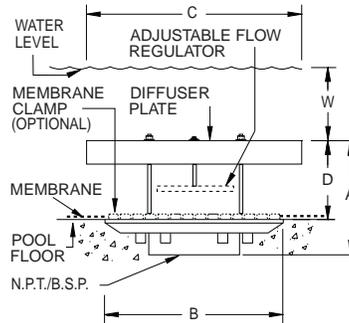
Inlet Fitting

Specification:

Construction of DEFO inlet body shall be cast bronze with DEFO opti-bronze textured FRP diffuser plate and stainless steel fasteners.

Options:

- (Add suffix)
- A - adjustable flow regulator
- C - cast bronze diffuser plate
- L - membrane clamp
- U - underdeck clamp
- V - square FRP diffuser plate
- Y - square FRP diffuser plate recessed for tiles



Function

Supply inlet for concrete pools with diffuser plate to disperse flow and reduce surface turbulence. Ideal for waterfalls and cascade fountains.

Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	w dim. min.
IFA-200	2"	5 1/2"	6 1/2"	8"	3 1/2"	3"
IFA-300	3"	6 1/2"	9"	12"	4"	4"
IFA-400	4"	6 1/2"	9"	12"	4"	8"
IFA-600	6"	7"	12"	16"	4"	10"
IFA-800	8"	10"	14"	16"	7"	10"

IFC series

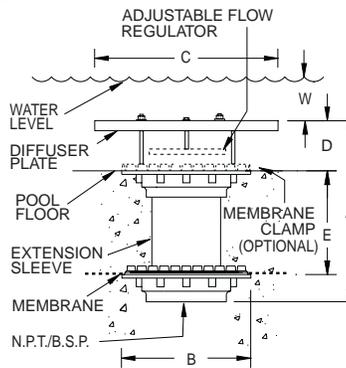
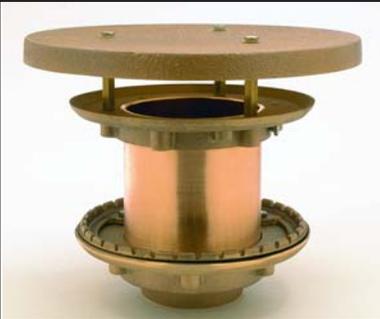
Inlet Fitting

Specification:

Construction of DEFO inlet body, membrane clamp and extension body shall be cast bronze with non-corrosive metal extension sleeve, DEFO opti-bronze textured FRP diffuser plate and stainless steel fasteners.

Options:

- (Add suffix)
- A - adjustable flow regulator
- C - cast bronze diffuser plate
- L - membrane clamp
- U - underdeck clamp
- V - square FRP diffuser plate
- Y - square FRP diffuser plate recessed for tiles



Function

Supply inlet for concrete pools with multiple slab penetrations. Diffuser plate disperses flow and reduces surface turbulence. Ideal for waterfalls and cascade fountains.

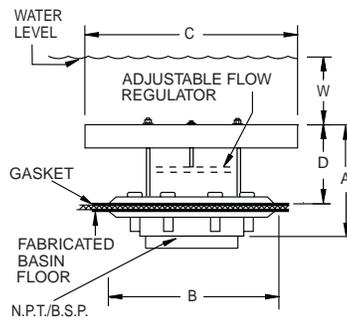
Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	e dim. min.	w dim. min.
IFC-200	2"	7"	6 1/2"	8"	3 1/2"	1 3/4"	3"
IFC-300	3"	8"	9"	12"	4"	1 1/2"	4"
IFC-400	4"	8"	9"	12"	4"	1 1/2"	8"
IFC-600	6"	14"	12"	16"	4"	10"	10"
IFC-800	8"	16"	14"	16"	7"	2 1/2"	10"

Inlet Fitting

Function

Supply inlet for **fabricated basins** with diffuser plate to disperse flow and reduce surface turbulence. Ideal for waterfalls and cascade fountains.



Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	d dim.	w dim. min.
IFF-200	2"	3 1/2"	6"	8"	2 1/4"	2"
IFF-300	3"	4 1/2"	7 5/8"	12"	2 3/4"	3"

IFF series

Specification:

Construction of DEFO inlet body shall be cast bronze with DEFO opti-bronze textured FRP diffuser plate and stainless steel fasteners.

Options:

(Add suffix)
 A - adjustable flow regulator
 C - cast bronze diffuser plate

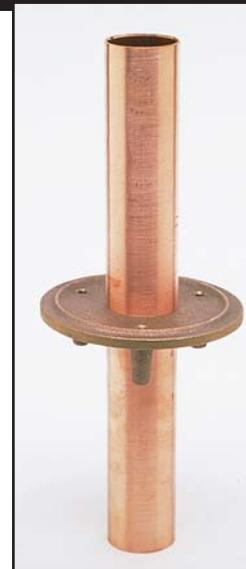
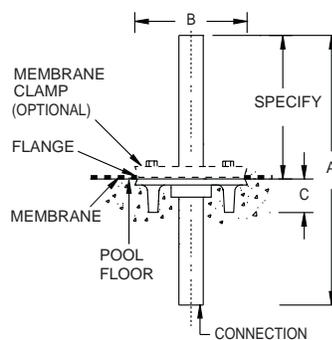
Note:

IFF series is designed for use with non-corrosive fabricated basins, troughs and reservoirs only.

Sleeve Fitting

Function

Sleeve fittings for drains and inlet lines into concrete pools ensure watertight penetration of decks, membranes and finished pool floors.



Dimensions

DEFO no.	connection dia.	a dim.	b dim.	c dim.
IFS-050	1/2"	12"	4 5/8"	1 1/4"
IFS-075	3/4"	12"	4 5/8"	1 1/4"
IFS-100	1"	12"	4 5/8"	1 1/4"
IFS-125	1 1/4"	12"	4 5/8"	1 1/4"
IFS-150	1 1/2"	12"	4 5/8"	1 1/4"
IFS-200	2"	12"	4 5/8"	1 1/4"
IFS-300	3"	12"	6 1/2"	1 1/4"
IFS-400	4"	12"	8 5/8"	1 1/4"

IFS series

Specification:

Construction of DEFO stub up pipe shall be copper with cast bronze flange soldered to pipe and stainless steel fasteners.

Options:

(Add suffix)
 L - membrane clamp
 S - pipe greater than 18"
 U - underdeck clamp

Replacement Parts

General Information For Drains

Standard Threading:

Standard threading on DEFO components shall be National Pipe Thread (NPT) unless requested otherwise at the time of order. All thread sizes less than 1" will be NPT.



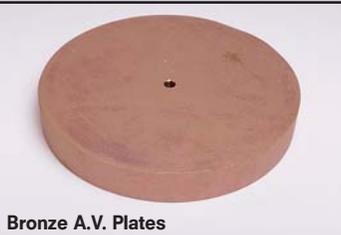
Drain Plugs



Strainer Baskets



Overflow Domes



Bronze A.V. Plates



Debris Screens



Flat Drain Grates



Inlet Extension Rods



Fiberglass A.V. Plates



Overflow Standpipes

Drain Plugs

Part #	Use with Item
D2" C55	DPA-200
D3" C55	DPA-300
D4" C55	DPA-400

Strainer Baskets

Part #	Use with Item
D2" C35	DSA-200
D3" C35	DSA-300/400
D4" C30	DSA-600
D6" C30	DSA-800

Overflow Domes

Part #	Use with Item
D2" C60	DOA-200
D3" C60	DOA-300
D4" C60	DOA-400

Bronze A.V. Plates

Part #	Use with Item
D2" C65	DSA-200
D3" C65	DSA-300/400
D6" C35	DSA-800

Debris Screens

Part #	Use with Item
D2" S10	DSA-200
D3" S10	DSA-300
D4" S10	DSA-400
D6" S10	DSA-600
D8" S10	DSA-800

Flat Drain Grates

Part #	Use with Item
D2" C85	DSA-200
D3" C85	DSA-300/400
D6" C85	DSA-600

Inlet Extension Rods

Part #	Use with Item
IF2" C10	IFA-200
IF3" C10	IFA-300
IF4" C10	IFA-400
IF6" C10	IFA-600
IF8" C10	IFA-800

Fiberglass A.V. Plates

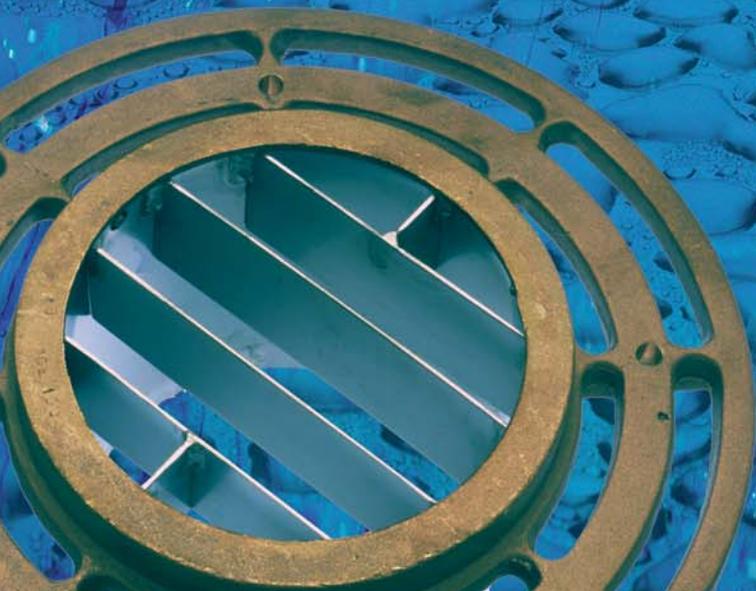
Part #	Use with Item
D2" C60	DSA-200
D3" C80	DSA-300/400
D6" C50	DSA-600/800

Overflow Standpipes

Part #	Use with Item
DOA/F200A10	DOA/DOF200
DOA/F300A10	DOA/DOF300
DOA/F400A10	DOA/DOF400



Accessories



Product	Pg
ACF Heavy Duty Hydraulic Water Level Controls	86
ACX Light Duty Hydraulic Water Level Controls	86
ADF Spray-Thru Sleeve	87
ADG Spray-Thru Sleeve	87
ADP Debris Pan For Sump	88
AFG Grate With Frame	88
AJD Drain with Center Jet	89
APJ Distribution Headers	89
ASL Swivel Connectors	90
ASU Swivel Connectors	90
ASX In-Concrete Swivel Connector	91
ATS Stainless Steel Suction Strainers	91
AWA Vacuum Fitting	92
AWB Vacuum Fitting	92
AWO Hydraulic Water Level Control and Overflow	93
AWS Wall Skimmer	93



ACF series

Heavy-Duty Hydraulic Water Level Control

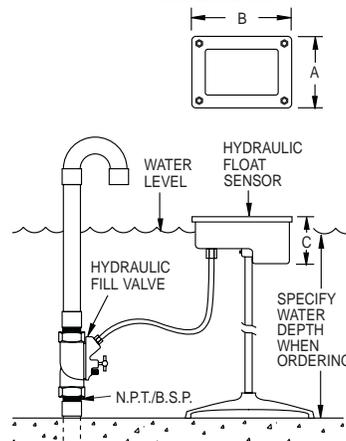
Specification:

Construction shall be brass, copper and stainless steel fitted with cast bronze DEFO hydraulic sensor body and stand, moulded plastic quick fill valve and copper fill spout.

Note:

(for optimum effect)

1. Specify water depth when ordering



Function

Freestanding, non-electric hydraulic water level controls with quick fill action for medium-sized and large pools. Variable height adjustments and slow closing feature prevent shock from water hammer. Fill spout and valve assembly attach to in-pool water supply.

Dimensions

DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	gpm at 15 psi
ACF-075	3/4"	3"	6"	3 1/2"	37
ACF-100	1"	3"	6"	3 1/2"	39
ACF-125	1 1/4"	3"	6"	3 1/2"	83
ACF-150	1 1/2"	3"	6"	3 1/2"	86
ACF-200	2"	3"	6"	3 1/2"	116

ACX series

Light Duty Hydraulic Water Level Control

Specification:

Construction shall be cast bronze frame with DEFO impact resistant stainless steel cover and moulded plastic enclosure. Brass and stainless steel fitted with moulded plastic quick fill valve.

Options:

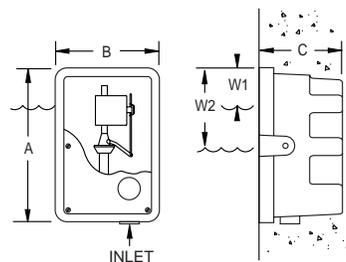
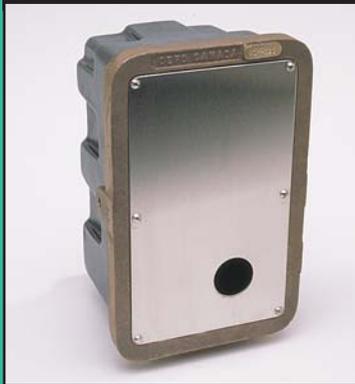
(Add suffix)

B - brass cover plate

Q - chromed frame

V - vandal resistant

fasteners and wrench kit



Function

Flush, wall mounted, non-electric hydraulic water level control with built-in level adjustment automatically fills small fountains.

Note:

1. ACX-050 maximum recommended water pressure is 25-30 PSI at 5 GPM.
2. ACX-100 maximum recommended water pressure is 35 PSI at 9 GPM.
3. Must be installed with a backflow preventer.
4. W1 dimension is factory set water level.

Dimensions

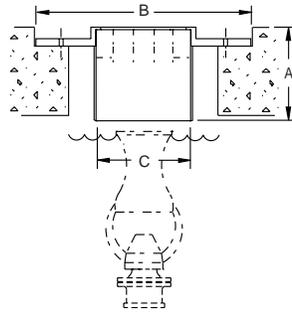
DEFO no.	inlet (npt) (bsp)	a dim.	b dim.	c dim.	w1 dim.	w2 dim.
ACX-050	1 1/2"	10"	6 1/2"	5 3/4"	2 3/8"	3 5/8"
ACX-100	1"	10"	6 1/2"	5 3/4"	2"	3 1/4"



Spray-Thru Sleeve

Function

Used in "dry pool" applications where it is desirable to conceal water reservoir and jets beneath pool floor slab. Ideal for public areas as well as areas prone to vandalism. Cascading water projects through sleeve and drains through the surface flange.



ADF series

Specification:

Construction shall be cast bronze and stainless steel.

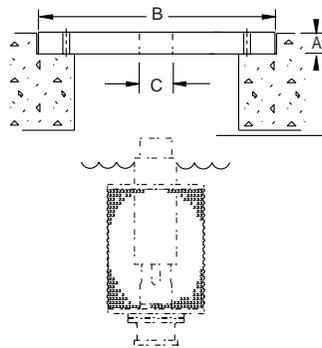
Dimensions

DEFO no.	a dim.	b dim.	c dim.
ADF-100	6' / 4"	12"	6' / 4"

Spray-Thru Sleeve

Function

Used in "dry pool" applications where it is desirable to conceal water reservoir and jets beneath pool floor slab. Ideal for public areas as well as areas prone to vandalism. Cascading water projects through center hole and drains through the surface flange.



ADG series

Specification:

Construction shall be cast bronze.

Note:

- (for optimum effect)
 1. Specify dimension 'C' when ordering.

Dimensions

DEFO no.	a dim.	b dim.	c dim.	
			min.	max.
ADG-100	1"	12"	1"	4"



ADP series

Debris Pan For Sump

Specification:

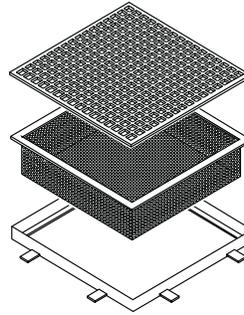
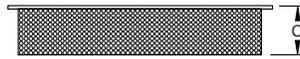
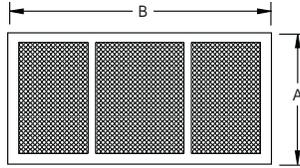
Construction shall be stainless steel.

Options:

(Add suffix)

A - 1/16" (.063"/1.5 mm) screen openings

B - 3/16" (.188"/4.7 mm) screen openings



Function

Fine screen debris pan fits between DEFO type AFG series sump grate and frame. The lift handle facilitates removal.

Feature:

1/8" (.125"/3 mm) screen openings

Notes:

Custom sizes available upon request.

Dimensions

DEFO no.	a dim.	b dim.	c dim.	free area sq. in.
ADP-200	20"	20"	4"	290
ADP-320	32"	20"	4"	420
ADP-330	32"	32"	4"	620
ADP-430	44"	32"	4"	810
ADP-440	44"	44"	4"	1060
ADP-640	56"	44"	4"	1300

AFG series

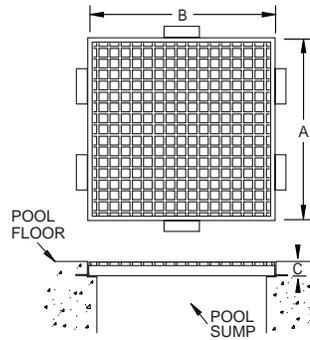
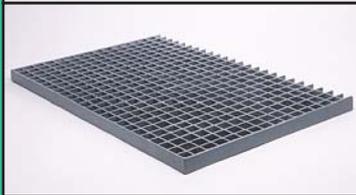
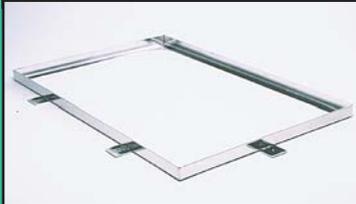
Grate With Frame

Specification:

Construction shall be strong, durable, lightweight 1" (25mm) square fibreglass with a heavy-duty DEFO stainless steel frame.

Notes:

Custom sizes available upon request.



Function

For use in sumps and pump pits. Permits water passage while providing a safety cover to the sump.

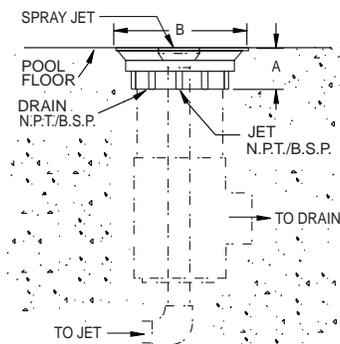
Dimensions

DEFO no.	a dim.	b dim.	c dim.	free area sq. in.
AFG-200	24"	24"	1 1/2"	400
AFG-320	36"	24"	1 1/2"	600
AFG-330	36"	36"	1 1/2"	900
AFG-430	48"	36"	1 1/2"	1200
AFG-440	48"	48"	1 1/2"	1600
AFG-640	60"	48"	1 1/2"	2000

Drain With Center Jet

Function

Primarily used in spray aprons for public playgrounds. The water for the jet is supplied through a 6" x 2" reducer at the base of a 6" x 4" branch 'T'. The 4" side outlet connects to a drain line.

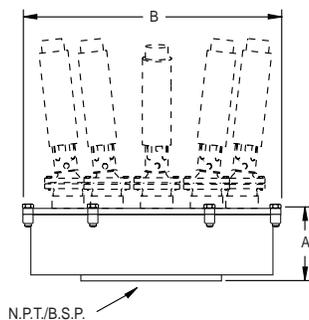


DEFO no.	suction strainer openings required	a dim.	b dim.	drain (npt) (bsp)	jet (npt) (bsp)	spray height	gpm	head	spread
						2'	4	3'	16"
						3'	5	5'	22"
AJD-100	.040	3 1/2"	12"	6"	1 1/4"	4'	6	6'	32"
						5'	7	8'	36"
						6'	7	10'	44"

Distribution Header

Function

Designed to suit specific custom design requirements such as distribution points within pools for nozzle assemblies and/or supply piping.



DEFO no.	inlet (npt) (bsp)	a dim. (od)	b dim. (od)	total inside cu. in.
APJ-100	2" - 3"	3"	7"	72
APJ-200	2" - 3"	3 1/2"	9"	98
APJ-300	3" - 4"	4 1/2"	10"	142
APJ-400	3" - 4"	4 1/2"	12"	363
APJ-500	3" - 4"	6 1/4"	14 1/2"	820
APJ-600	4" - 6"	8"	18"	1590

AJD series

Specification:

Construction shall be machined cast bronze, brass and stainless steel fitted. Copper or plastic piping may be used.

APJ series

Specification:

Construction shall be cast bronze with neoprene gaskets and stainless steel fasteners.

Note:

(for optimum effect)

1. Maximum pressure 100 foot head (30M).
2. Side outlets (to 1 1/2"/40 mm) limited to selected headers.
3. Contact factory for detailed drawings and information before selecting.

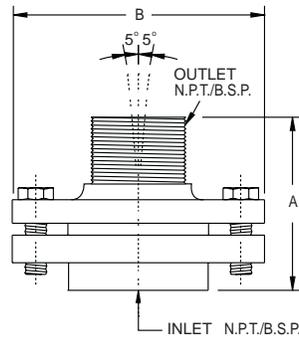


ASL series

Swivel Connector

Specification:

Construction shall be cast bronze and stainless steel fitted.



Function

Connects to bottom of nozzles. Facilitates directional alignment after installation. Maximum 5° of adjustment from center line.

Dimensions

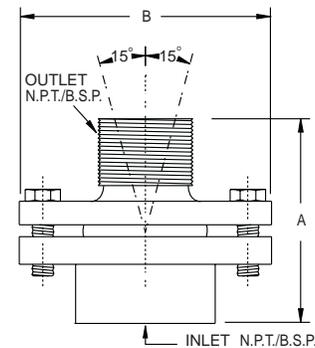
DEFO no.	inlet conn. (npt/bsp)	outlet conn. (npt/bsp)	a dim.	b dim.
ASL-075	3/4"	3/4"	2 1/4"	3"
ASL-100	1"	1"	2 1/4"	3"
ASL-125	1 1/4"	1 1/4"	2 5/4"	4"
ASL-150	1 1/2"	1 1/2"	2 5/4"	4"
ASL-200	2"	2"	3"	4 1/2"
ASL-300	3"	3"	3"	6 1/4"
ASL-600	6"	6"	4"	12"

ASU series

Swivel Connector

Specification:

Construction shall be machined cast bronze and stainless steel fitted.



Function

Connects to bottom of nozzles. Facilitates directional alignment after installation. Maximum 15° of adjustment from center line.

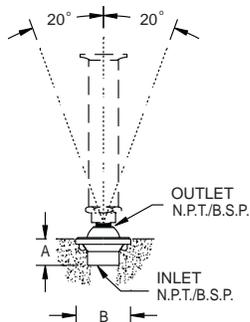
Dimensions

DEFO no.	inlet conn. (npt/bsp)	outlet conn. (npt/bsp)	a dim.	b dim.
ASU-075	3/4"	3/4"	2 1/2"	2 1/4"
ASU-100	1"	1"	2 3/4"	2 1/2"
ASU-125	1 1/4"	1 1/4"	3 1/4"	3"
ASU-150	1 1/2"	1 1/2"	3 3/4"	3 1/4"
ASU-200	2"	2"	5"	4 1/2"
ASU-300	3"	3"	5 3/4"	6"

In-Concrete Swivel Connector

Function

Cast-in-concrete swivel connects to bottom of nozzles and facilitates directional alignment after installation. Provides jet alignment in very shallow pools or wall mounted nozzles. Maximum 20° of adjustment from center line.



Dimensions

DEFO no.	inlet conn. (npt/bsp)	outlet conn. (npt/bsp)	a dim.	b dim.
ASX-150	1 1/2"	1"	2"	4"

ASX series

Specification:

Construction shall be machined cast bronze with neoprene pressure O-ring gasket and stainless steel fasteners.

Options:

(Add suffix)

- K - surface flange
- L - membrane clamp
- Q - chrome surface
- W - winter cover

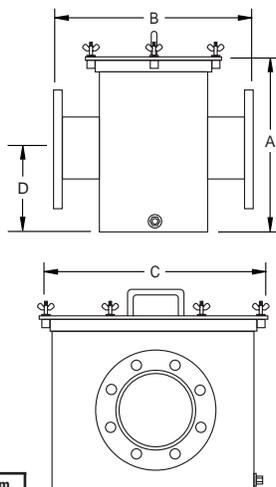
Stainless Steel Suction Strainer

Function

The ultimate strainer for fountain use. Lightweight stainless steel construction for easy handling. Has fine screening and unequalled flow characteristics.

Feature:

1/8" (0.125"/3mm) screen openings standard.



Dimensions

DEFO no.	flange area size	screen sq. in.	a dim.	b dim.	c dim.	d dim.	gpm (max. flow)
ATS-003	3"	80	10"	15"	17 1/4"	5"	120
ATS-004	4"	80	10"	15"	17 1/4"	5"	200
ATS-005	5"	80	10"	15"	17 1/4"	5"	500
ATS-006	6"	80	10"	15"	17 1/4"	5"	800
ATS-008	8"	120	15"	15"	17 1/4"	7 1/2"	1300
ATS-010	10"	120	15"	15"	17 1/4"	8"	1700

ATS series

Specification:

Construction shall be type 304 stainless steel with large fine screen basket, quick release cover, drain plug and vented lid. Flanges shall be galvanized, vanstone and adjustable. Pressure gasket shall be neoprene.

Options:

(Add suffix)

- A - 1/16" (0.063"/1.5mm) screen openings
- B - 1/32" (0.031"/0.8mm) screen openings
- O - stainless steel flanges
- P - PN16 or PN10 flanges

Notes

Custom strainer sizes available upon request



AWA series

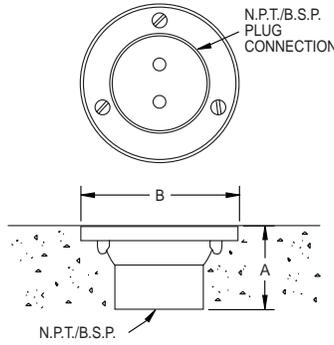
Vacuum Fitting

Specification:

Construction shall be cast bronze with stainless steel fasteners.

Options:

- (Add suffix)
- K - key (cover removal)
- J - surface flange
- L - membrane clamp
- Q - chromed surface



Function

Precision engineered for heavy-duty fountain use. Supplied with vandal resistant vacuum plug.

Dimensions

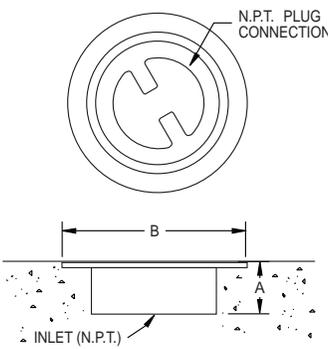
DEFO no.	inlet conn. (npt/bsp)	plug conn. (npt/bsp)	a dim.	b dim.
AWA-150	1 1/2"	1 1/4"	2"	4"

AWB series

Vacuum fitting

Specification:

Construction shall be chromed finished cast bronze.



Function

Cast-in-concrete vacuum fitting used for pool maintenance. Supplied with vacuum plug.

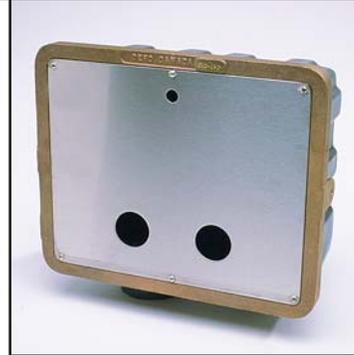
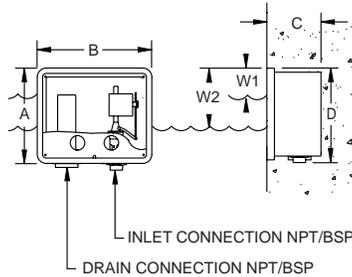
Dimensions

DEFO no.	inlet conn. (npt)	plug conn. (npt)	a dim.	b dim.
AWB-150	1 1/2"	1 1/2"	1 1/2"	3"

Combination Hydraulic Water Level and Overflow Assembly

Function

Flush, wall mounted, non-electric combination hydraulic water level control with built-in level adjustment and overflow drain. Automatically fills small to medium-sized pools and drains overflow water through a built-in adjustable drain.



AWO series

Specification:

Construction shall be cast bronze frame with DEFO impact resistant stainless steel cover and moulded plastic enclosure. Overflow drain assembly shall be brass, copper and extruded plastic fitted with moulded plastic quick fill valve.

Options:

(Add suffix)
 B - brass cover plate
 Q - chromed frame
 V - vandal resistant fasteners and wrench kit

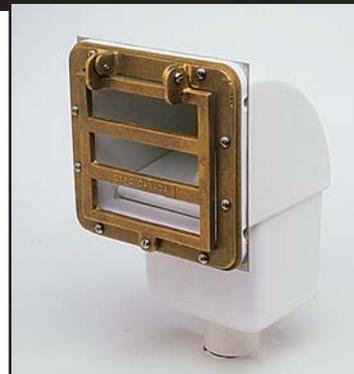
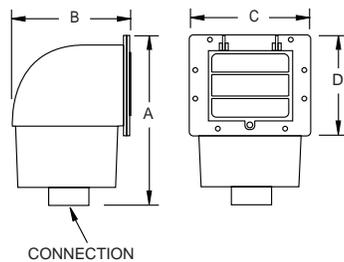
DEFO no.	inlet conn. (npt/bsp)	drain conn. (npt/bsp)	a dim.	b dim.	c dim.	d dim.	w1 dim.	w2 dim.
AWO-050	1 1/2"	2"	10"	12"	5 1/2"	11 1/2"	2 3/8"	3 5/8"
AWO-100	1"	2"	10"	12"	5 1/2"	11 1/2"	1 3/4"	3"

Note:

- AWO-050 maximum recommended water pressure is 25-30 PSI at 5 GPM.
- AWO-100 maximum recommended water pressure is 35 PSI at 9 GPM.
- Must be installed with a backflow preventer.

Function

Ideal for surface skimming of leaves and debris. front access eases cleaning. Shallow depth allows thin wall installation. DEFO hinged and secured face grille prevents vandalism.



Wall Skimmer

AWS series

Specification:

DEFO wall skimmer shall have extruded plastic body. Integral debris basket and floating weir skimmer. DEFO face plate and hinged grille shall be cast bronze.

Options:

(Add suffix)
 Q - chrome plated

DEFO no.	conn. PVC	a dim.	b dim.	c dim.	d dim.
AWS-150	1 1/2"	12 5/8"	7 1/2"	7 1/2"	7 1/4"

Replacement Parts

General Information For Accessories

Standard Threading:

Standard threading on DEFO components shall be National Pipe Thread (NPT) unless requested otherwise at the time of order. All thread sizes less than 1" will be NPT.



AWA Key



Vandal Resistant Driver Kit



ACF Hydraulic Float



ACX Hydraulic Valves

Hydraulic Sensors

Part #	Description
AWO100C85 075/100/125/150/200	ACF Hydraulic Float ACF-
AVQ100 (Not Shown) 075/100/125/150/200	Hydraulic Valve ACF-
ACF/WC40 (Not Shown) 075/100/125/150/200	Feeder Tube ACF-
ACX050C10	ACX Hydraulic Valve ACX050, AWO050
ACX100C10 (Not Shown)	Hydraulic Float/Valve ACX100, AWO100
AWOC70 Driver Kit	Vandal Resistant
NLF075K	Key for AWA



Engineering Data and Conversion Factors

Quick Conversion Factors

Convert From Multiply By Convert Into

Flow

USGPM	.0631	Litres/second
USGPM	3.785	Litres/minute
USGPM	227.3	Litres/hour
Litres/sec.	15.85	USGPM
Litres/min.	.264	USGPM
Litres/hour	.0044	USGPM
Cu Ft./sec.	448.83	USGPM
Cu M/min.	264.2	USGPM

Pressure

PSI	6.895	KPA
PSI	2.310	Ft. Head
KPA	.145	PSI
KPA	.334	Ft. Head
Ft. Head	2.990	KPA
Ft. Head	0.433	PSI
Ft. Head	0.305	Metric Head
Ft. Head	3.280	Ft. Head

Volume

U.S Gals.	231.0	Cu. In.
U.S Gals.	.1337	Cu. Ft.
U.S Gals.	3.785	Litres
U.S Gals.	.0038	Cu. Metres
Litres	.2642	U.S. Gals.
Litres	.0353	Cu. Ft.
Cu. Metres	35.311	Cu. Ft.
Cu. Metres	264.2	U.S. Gals.
Cu. Ft.	7.48	U.S. Gals.
Cu. Ft.	28.329	Litres
Cu. Ft.	0.028	Cu. Metres

Weight

U.S Gals.	8.35	Lbs.
Litres	2.2	Lbs.
Cu. Ft. Of Water	62.46	Lbs.
Cu. M. Water	22.06	Lbs.

Length

Inches	2.54	Centimeters
Feet	.3048	Metres
Metres	39.37	Inches
Metres	3.28	Feet

Horsepower

HP	.746	Kilowatts
HP	745.7	Watts
Kilowatts	1.34	HP

U.S. Pump Charts

GPM (60 cy)	.80	GPM (50 cy)
Head (60 cy)	.60	GPM (50 cy)

To Find HP Of A Pump:

$$\text{BHP} = \frac{\text{USGPM} \times \text{Hd in Ft.} \times \text{S.G.} (1.0)}{3960 \times \% \text{ Efficiency (EST. .75\%)}}$$

Pipe Flow Guide

Pipe sizes and capacities are those recommended as good practice for fluid velocities on hydronic applications.

pipe size	flow usgpm	pipe size	flow usgpm
1 1/2"	10 - 25	5"	200 - 500
2"	20 - 50	6"	330 - 800
3"	55 - 135	8"	700 - 1300
4"	115 - 275	10"	1250 - 1750

Waterfall Requirements (per lineal foot)

spill thickness	gpm	maximum fall height
0.1"	5	1'
0.2"	10	3'
0.3"	15	4'
0.4"	20	5'
0.5"	25	6'
0.6"	30	7'
0.7"	35	8'
0.8"	40	8.5'
0.9"	45	9'
1.0"	50	10'

Example: To determine the gpm requirements for a 10ft. long waterfall with a 3ft. fall height; specified with 0.3" spill thickness, multiply 10x15 = 150 gpm .

Note: Turbulent water may require greater flow. Lower pool should be approximately two times larger than upper pool to handle start-up and shut-down variables.



WARRANTY

Crystal Fountains warrants that, subject to the terms and conditions herein expressed, it shall repair or replace goods purchased from it and shown to have defects in material or workmanship within the time periods specified below:

1. All brass and bronze components manufactured by Crystal Fountains- ten (10) years from the date of purchase;
2. All other components manufactured by Crystal Fountains- one (1) year from the date of purchase;
3. All equipment and accessories not manufactured by Crystal Fountains- the period specified in the original manufacturer's warranty.
4. No warranty is provided on lamps, lenses, or gaskets.

The warranty on components manufactured by Crystal Fountains is expressly limited to the repair or replacement of such components at Crystal Fountains' factory in cases in which, in Crystal Fountains' sole opinion, damage was not caused by misuse or improper operation. Crystal Fountains shall not be responsible for any damage or losses, direct or indirect, which may be attributable to the supply or replacement of defective parts. It is the responsibility of the purchaser to deliver to the factory at its cost any components which it considers to be defective.

Crystal Fountains shall not be responsible for any damage or losses, direct or indirect, which result from:

1. the use of components, equipment, or accessories purchased from it for purposes, or in a manner not intended by Crystal Fountains;
2. modifications to, or breakage of components, equipment, or accessories by the purchaser or other parties;
3. unsuitable operating conditions, including but not limited to improper voltage supply, motor misalignment, poor water quality, corrosion, electrolysis, and abrasion.