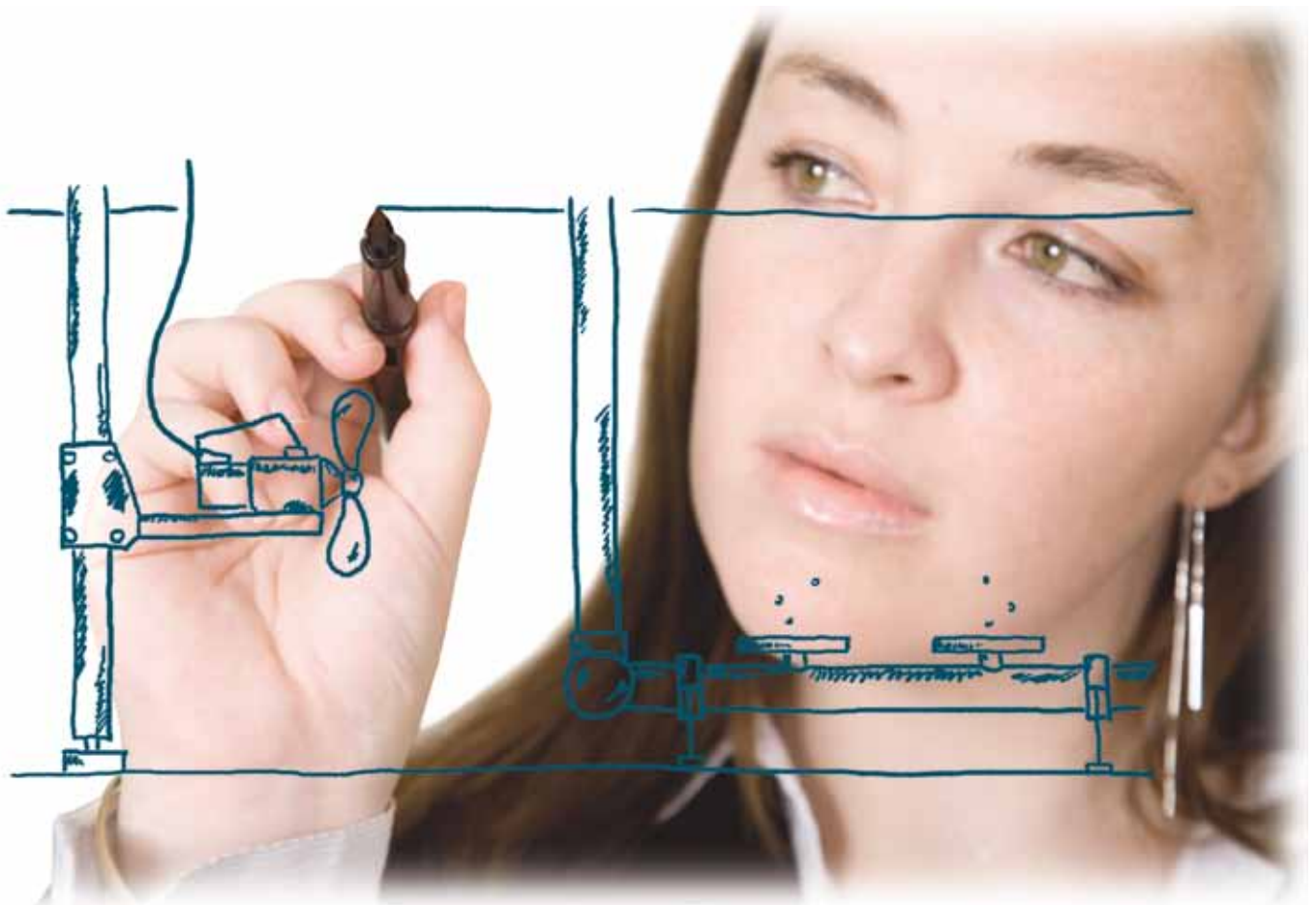


2.0

AIR DIFFUSERS AND AERATORS



AIR DIFFUSERS AND SUBMERGED AERATORS

Zenit offers a line of aeration and mixing products for the highly specialized civil and industrial wastewater treatment sector.

The Zenit products include:

- 9" and 12" disc and 2" tube **air diffusers** with elastomer membranes providing high oxygen transfer efficiency
- Venturi-type **submerged aerators**, which ensure an efficient combined mixing and aeration action and are especially suitable for homogenization tanks and storm water retention tank

As well as supplying products of outstanding quality, Zenit provides its customers with assistance during product selection and plant design, and supervision during assembly.



TESTING AND INSPECTION DEPARTMENT

Constantly working to improve the quality of its products, Zenit has completed the construction of its new testing tank at the San Cesario sul Panaro (Modena) production location.

This structure, 8 metres square and 10 metres deep (6.50 metres underground) is capable of containing 600 m³ of water (head of 9.50 m) and will fulfil a large number of functions thanks to the large number of tests it will be able to perform, and its overall versatility.

Tests will be possible not only on submersible electric pumps but also on all aeration and mixing products.

Specifically, measurement will be possible of:

- flow rate - head - efficiency (up to DN 800)
- NPSH
- oxygen transfer
- air output
- thrust measurement
- flow configuration
- degree of mixing



2.1 AIR DIFFUSERS



The Zenit range includes both disc and tube membrane air diffusers.

Both models are fitted with high-quality membranes with perforation ensuring high oxygen transfer with low headloss, minimizing the relative energy consumption.

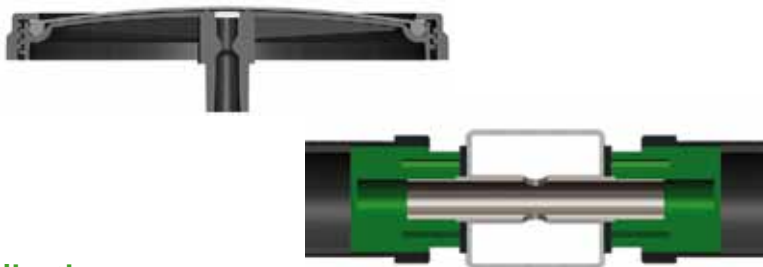
Disc diffusers can be fitted with ball check valves.

Zenit is able to design the most efficient aeration system for the customer's specifications, and supply the complete system, including detailed assembly drawings.

Operating Principle

During operation, the membrane inflates to open the tiny holes and allow the air to flow out in the form of fine bubbles. When the blower stops, the membrane deflates and pressure of the water pushes it back into contact with the supporting disc.

In this condition, the holes are closed and the central part, free from holes and specially shaped, acts as a check valve, ruling out all possible inflow of liquid.



Application

Membrane air diffusers are generally used in waste water treatment where sewage have to be aerated to activate biological oxidation of the organic material and nitrification processes.

They are also used in pre-aeration and aeration processes in oxidation tanks and aerobic digestion plants for civil and industrial sludges.



OXYPLATE 9-12

Disc air diffusers

Description and applications

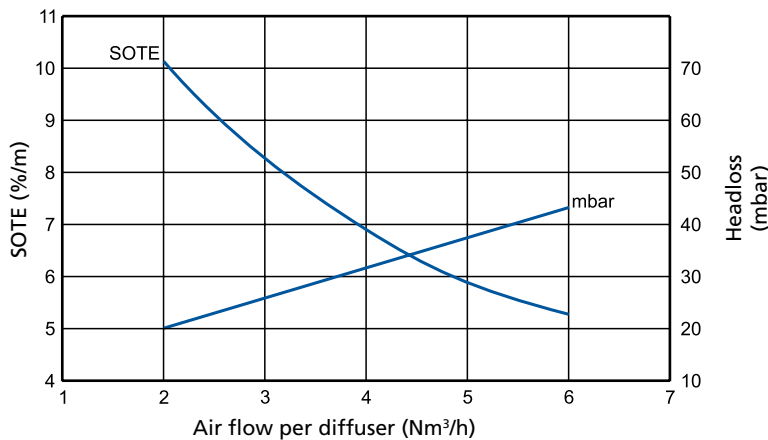
Disc diffusers having elastomer membrane with tiny holes for application in waste water treatment processes in reactors with continuous or intermittent aeration, especially recommended for high-efficiency permanent installations. The quality, design and membrane hole size ensure unbeatable efficiency in terms of the ideal oxygen transfer-headloss balance.



All product images are indicative only

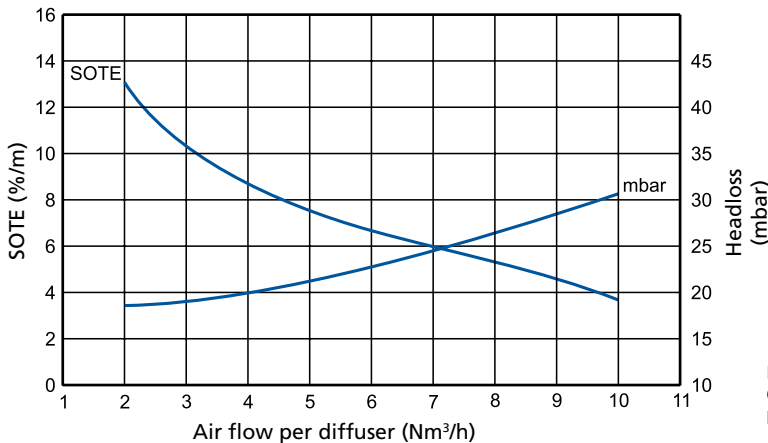
Performance

OXYPLATE 9



EPDM LP membrane, fine bubbles
Oxygen transfer according with ATV M209
Density 6.5%

OXYPLATE 12



EPDM LP membrane, fine bubbles
Oxygen transfer according with ATV M209
Density 5.3%

Technical characteristics

		OXYPLATE 9"	OXYPLATE 12"
External diameter	mm	270	340
Min. operating flow rate	Nm ³ /h	2	2
Max. operating flow rate	Nm ³ /h	6	10
Max overload flow *	Nm ³ /h	10	15
Active surface area	m ²	0,038	0,06
Membrane thickness	mm	2 ± 0.15	2 ± 0.15

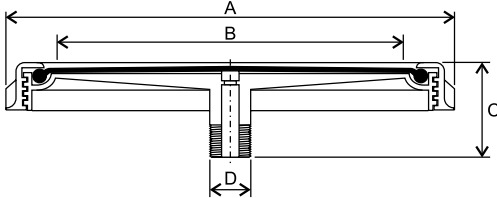
Data with fine-bubble EPDM LP membrane

* No more than 10 min/day for membrane cleaning, tests, etc.

Construction materials

	OXYPLATE 9"	OXYPLATE 12"
Diffuser body	PP GF 30	PP GF 30
Ring-nut	PP GF 30	PP GF 30
Membrane	EPDM LP / SILICONE	EPDM LP

Overall dimensions and weights



	A	B	C	D	E	Kg
OXYPLATE 9"	270	220	76	3/4 NPT m	32	0.7
OXYPLATE 12"	340	310	76	3/4 NPT m	32	1.2

Dimension in mm *All weights and dimensions are indicative only*

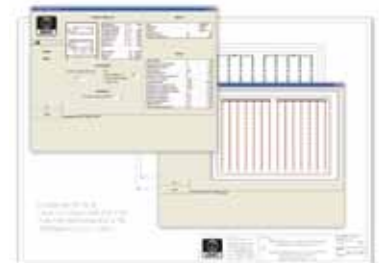
Accessories and components

ZENIT is able to design and build complete aeration systems including disc-shaped diffusers and preassembled PVC air distribution networks.

The high degree of standardization, combined with the use of special components manufactured by ZENIT itself, allows the construction of simple, reliable, quick-to-install systems which are surprisingly inexpensive in spite of the use of top-quality materials such as PVC PN10 pipelines and stainless steel supports.



To facilitate the installation and servicing of its diffuser systems, Zenit has produced a series of tools that make every procedure quick and effective.



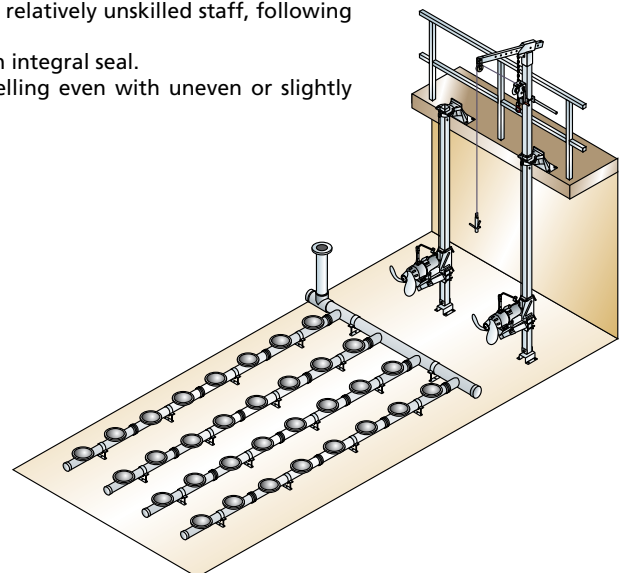
The use of dedicated software packages makes system design a quick operation, from the process to the optimal layout, through to cost analysis and generation of the bill of materials.

Installations

Preassembled systems are designed for quick, easy installation even by relatively unskilled staff, following the detailed instructions provided.

All connections are made by means of special self-aligning flanges with integral seal.

The supports are easily height-adjustable (up to 20 cm) to allow levelling even with uneven or slightly sloping tank bottoms.



OXYTUBE 2

Tube air diffusers



All product images are indicative only

Description and applications

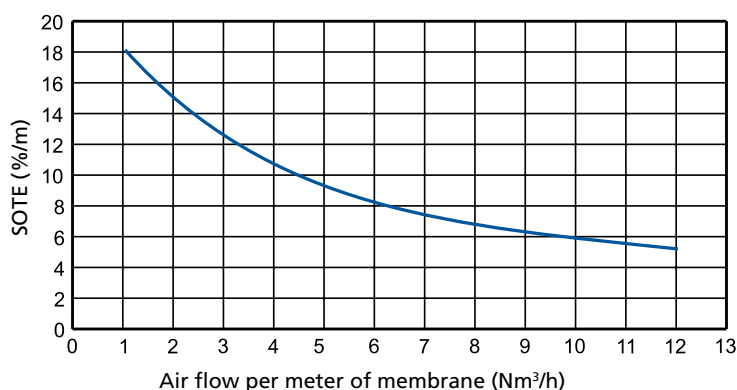
Especially recommended for the construction of lifting aeration systems and in all cases where a large output surface area is required with only a small number of air distribution pipelines.

Diffusers basically consist of a head with threaded connection, the rigid polypropylene support and the tubular membrane in elastomer with tiny holes, secured with stainless steel band clamps.

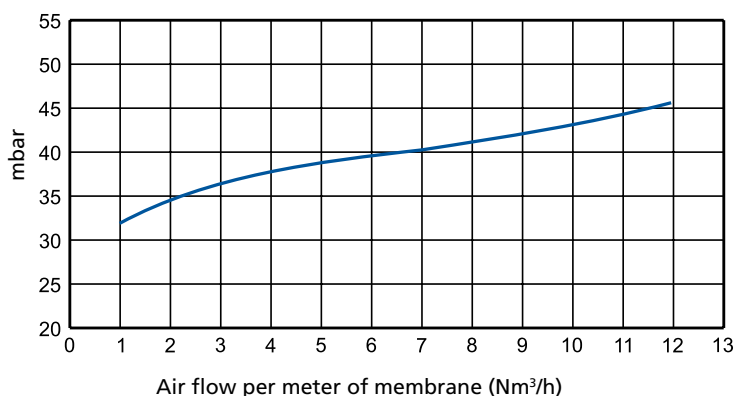
Performance

Oxygen transfer

density 10% - test according with ATV-M 209



Headloss



Technical characteristics

		OXYTUBE 2-500	OXYTUBE 2-750	OXYTUBE 2-1000
Support diameter	mm	63	63	63
Perforation length	mm	500	750	1000
Min. operating flow rate	Nm³/h	1	2	3
Max. operating flow rate	Nm³/h	6	9	12
Max overload flow *	Nm³/h	10	15	20
Active surface area	m²	0.09	0.135	0.18
Membrane thickness	mm	1.7±0.2	1.7±0.2	1.7±0.2

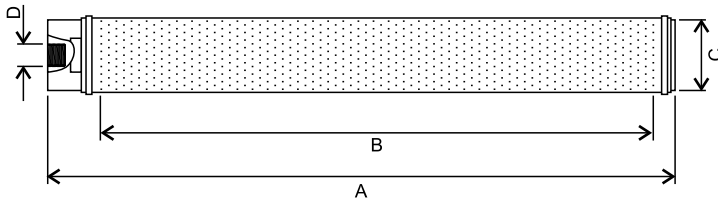
Data with fine-bubble EPDM LP membrane

* No more than 10 min/day for membrane cleaning, tests, etc.

Construction materials

Membrane	EPDM LP / SILICONE
Support	PP
Head	PP GF 30
Band clamps	V2A (stainless steel 1.4301 – AISI 304)
Gasket	EPDM th. 4 mm
Connector	V2A (stainless steel 1.4301 – AISI 304)

Overall dimensions and weights



	A	B	C	D	Kg
OXYTUBE 500	560	500	63	3/4" WR f	0.8
OXYTUBE 750	810	750	63	3/4" WR f	1.1
OXYTUBE 1000	1060	1000	63	3/4" WR f	1.3

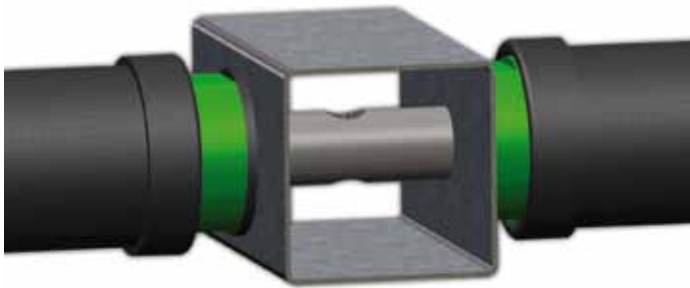
Dimension in mm

All weights and dimensions are indicative only

Accessories and components

Membranes made of different materials are available for different applications:

- EPDM LP with low plasticizer content (<15%) for civil wastewater with some industrial input and industrial wastewater with low grease, oil and hydrocarbon content. Maximum operating temperature 80 °C.
- SILICONE for industrial wastewater with high grease and hydrocarbon content. Maximum operating temperature 100 °C.



- Stainless steel connectors for installation of diffusers in pairs facing each other on square manifold of 80x80 mm or 100x100 mm.
- Adaptors for manifolds with existing holes.

Lifting systems

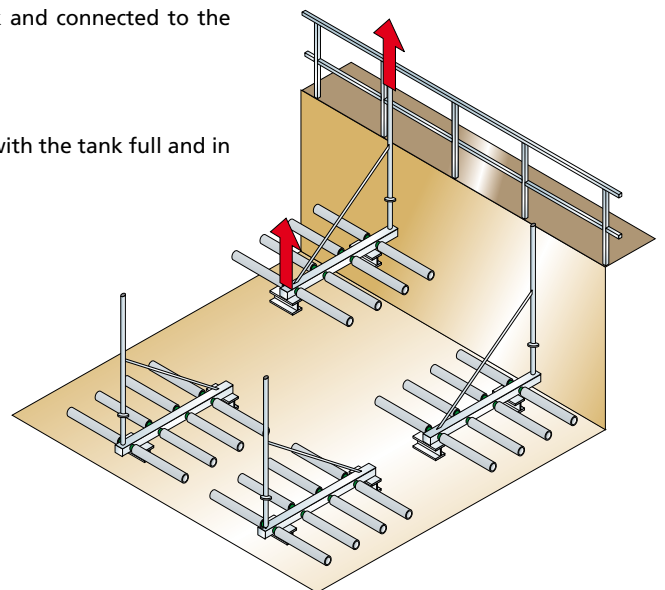
Especially recommended for small/medium sized systems, or in general in all cases where it is not possible to empty the tank for maintenance. These systems are built with stainless steel grids comprising basically a square manifold on which the diffusers are installed in facing pairs, a dropleg, one or more stiffener tie-rods and a draining system.

The individual grids are simply placed on the bottom of the tank and connected to the main air pipeline with a flange.

Stability is ensured by counterweights that also act as feet.

No runner or anchor systems are required.

The individual assemblies are therefore easy to remove and install with the tank full and in operation.



2.2 SUBMERGED AERATORS

Venturi-type submerged aerators ensure an efficient combined mixing and aeration action and they are especially suitable for homogenization tanks and storm water retention tanks.

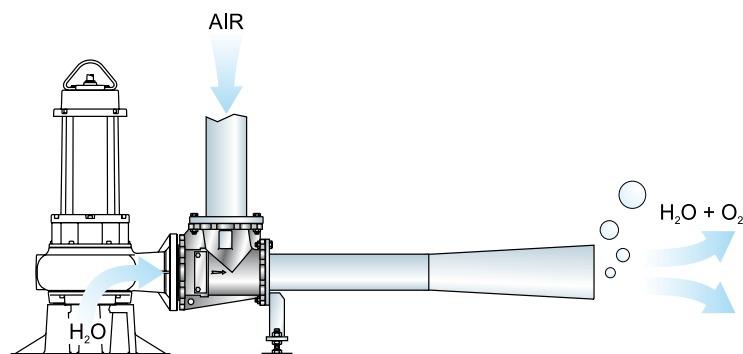
OXY 80 and 150 units have a polyurethane (Vulkollan) diaphragm, easily replaceable without dismantling the pump from the ejector thanks to a patented system. The OXY80 device has a flange suitable for connection to electric pumps having delivery DN80 and DN100.



All product images are indicative only

Operating Principle

In OXY devices, the liquid conveyed is mixed with the air by the "Venturi" effect, creating a mixture containing medium-fine air bubbles that increase the contact surface area and provide highly efficient oxygen transferring.



Application

OXY submerged oxygenation systems are used in civil and industrial wastewater and sludge treatment plants, or whenever combined oxygenation and mixing are required.

These systems can be installed without emptying the tank.



2.2.1 OXY

Key to product codes

OXY 8055



OXY 50



CHARACTERISTICS

- Cast iron structure (GJL-250)
- Suitable for use with DRO and DGO pumps
- can be permanently coupled to the pump or mounted on the bottom of the tank using the automatic coupling system (DAC type)

COMPOSITION OF OXY 50

- OXY body (cone + integral diaphragm)
- Sliding flange with gasket and stainless steel screws
- Pipe guide



A special technical detail on the OXY body allows mechanical fixing (using screws) between the ejector output flange and the sliding flange connected to the pump, creating a rigid system even suitable for mobile installation.

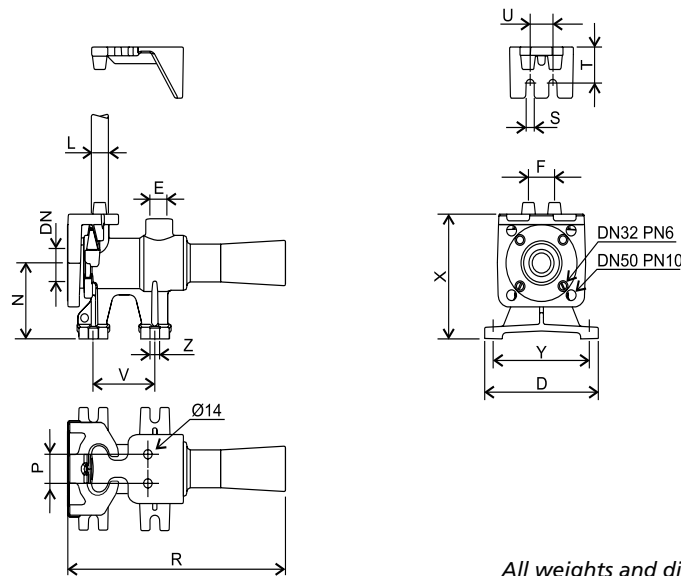
Construction materials

Body	Cast iron GJL-250
Diffuser cone	Cast iron GJL-250
Nuts and bolts	Stainless steel
Paintwork	Environment friendly epoxy-vinyl

Models

- OXY 5027

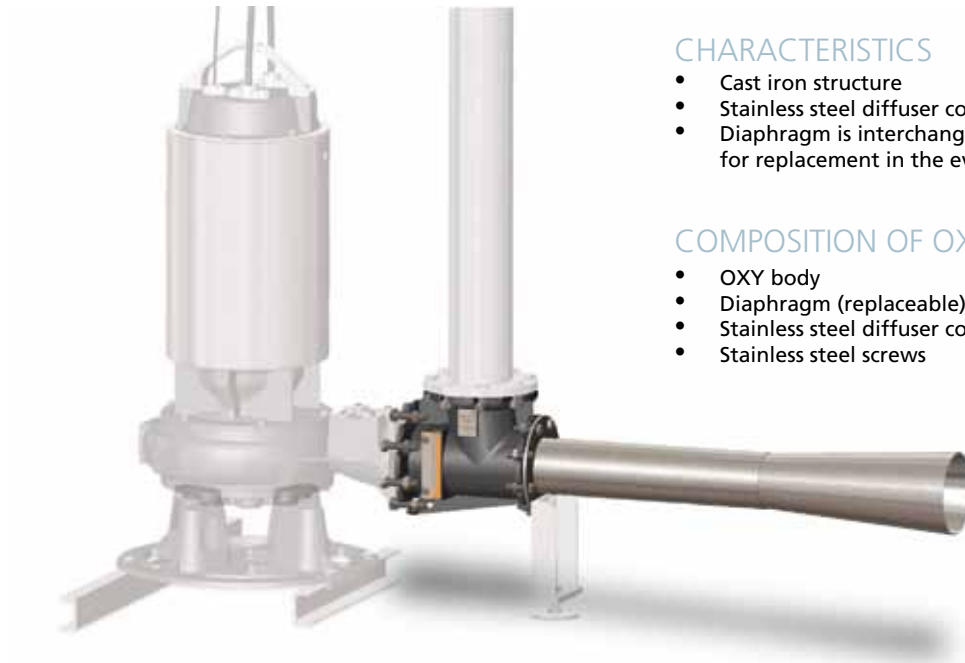
Overall dimensions



Dimension in mm
All weights and dimensions are indicative only

	DN	D	E	F	L	N	P	R	S	T	U	V	X	Y	Z	Kg
OXY 5027	DN32 PN6 - DN50 PN10	170	3/4"	40	3/4"	105	40	325	12	50	35	90	170	140	14	10

OXY 80-150



CHARACTERISTICS

- Cast iron structure
- Stainless steel diffuser cone
- Diaphragm is interchangeable for flow rate adjustment or for replacement in the event of wear (PATENTED SYSTEM)

COMPOSITION OF OXY 80-150

- OXY body
- Diaphragm (replaceable)
- Stainless steel diffuser cone
- Stainless steel screws



PATENTED SYSTEM

Construction materials

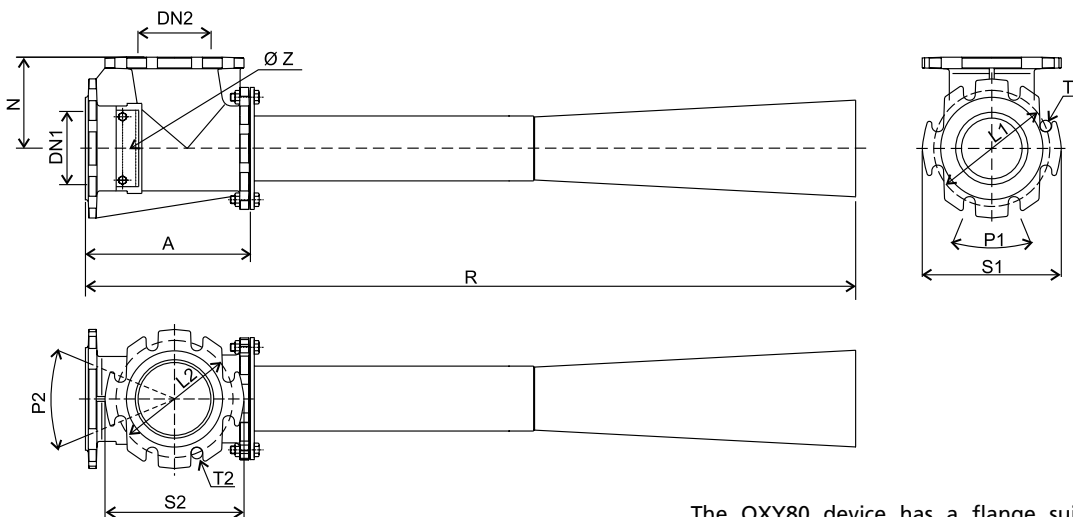
Body	Cast iron GJL-250
Diffuser cone	AISI 304 Stainless Steel
Diaphragm	Vulkollan
Nuts and bolts	A2 steel
Paintwork	Environment-friendly epoxy-vinyl

Models

- OXY 8055
- OXY 8063
- OXY 15080
- OXY 15095

OXY 80 and 150 range units can be combined with the coupling foot base horizontal outlet of the same diameter (DAC H). This combination allows the OXY body to be fixed to the bottom of the tank for easier pump maintenance, and also allowing it to be used in more than one point (not simultaneously).

Overall dimensions



The OXY80 device has a flange suitable for connection to electric pumps having delivery DN80 and DN100.

	Z	A	DN1	DN2	L1	L2	N	P1	P2	R	S1	S2	T1	T2	Kg
OXY 8055	55	250	80-100	100	160-180	180	145	45°-90°	45°	1000	200	220	17	20	19
OXY 8063	63	250	80-100	100	160-180	180	145	45°-90°	45°	1000	200	220	17	20	19
OXY 15080	80	340	150	150	240	240	190	45°	45°	1500	285	285	24	24	48
OXY 15095	95	340	150	150	240	240	190	45°	45°	1500	285	285	24	24	48

Dimension in mm

All weights and dimensions are indicative only

2.2.2 SYSTEM OXY

SYSTEM OXY 50



SYSTEM OXY 50 COMPOSITION

- OXY body (cone + integral diaphragm)
- Sliding flange with gasket and stainless steel screws
- Pipe guide
- Galvanized steel base



A special technical detail on the OXY body allows mechanical fixing (using screws) between the ejector output flange and the sliding flange connected to the pump, creating a rigid system even suitable for mobile installation.

Models

	OXY System	OXY Ejector		Intake pipeline	
	DN (mm)	Nr.	Tipo	L max. (m) (*)	Ø
S-OXY 50 1/5027	50	1	5027	(**)	3/4" (**)

(*) Maximum installation depth

(**) Intake pipeline not supplied

For overall dimensions, see drawing of JETOXY 50

SYSTEM OXY 80÷300



SYSTEM OXY 80÷300 COMPOSITION

- OXY body
- Diaphragm (interchangeable)
- Stainless steel diffuser cone
- Stainless steel screws
- Air intake pipe with flue filter and galvanized steel lifting hook
- Connecting tie-rod between pump and air intake pipe
- Galvanized steel/spheroidal cast iron base

Models

	OXY System	OXY Ejector		Air intake pipe	
	DN (mm)	Nr.	Tipo	L max. (m) *	DN (mm)
S-OXY 80 1/8055 35	80/100	1	8055	3.50	100
S-OXY 80 1/8055 50	80/100	1	8055	5.00	100
S-OXY 80 1/8063 35	80/100	1	8063	3.50	100
S-OXY 80 1/8063 50	80/100	1	8063	5.00	100
S-OXY 150 1/15080 35	150	1	15080	3.50	150
S-OXY 150 1/15080 50	150	1	15080	5.00	150
S-OXY 150 1/15095 35	150	1	15095	3.50	150
S-OXY 150 1/15095 50	150	1	15095	5.00	150
S-OXY 250 2/15095 35	250	2	15095	3.50	200
S-OXY 250 2/15095 50	250	2	15095	5.00	200
S-OXY 300 2/15095 35	300	2	15095	3.50	200
S-OXY 300 2/15095 50	300	2	15095	5.00	200

* Maximum installation depth

All weights and dimensions are indicative only

