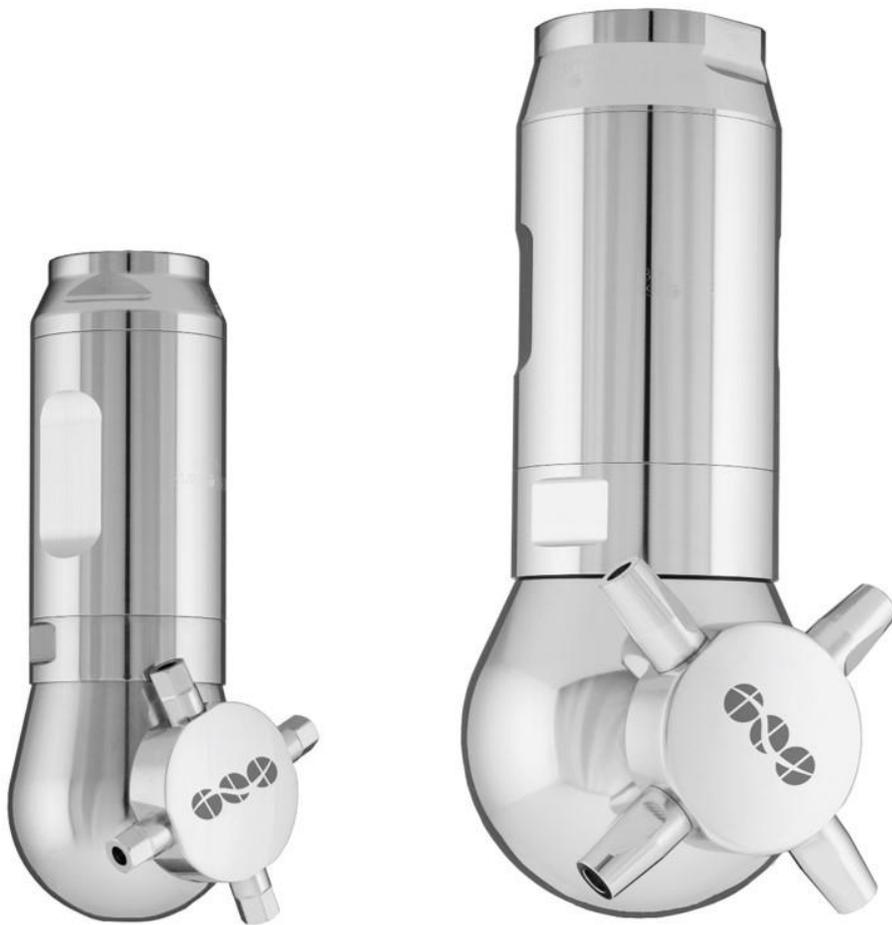


Assembly Manual

Dunos O50 F

Dunos O90 F



AquaDuna

FLUID PROCESS GROUP



This assembly manual is an integral part of the Target Jet Cleaner and must be available to the user at all times.

All safety instructions must be made sufficiently known and observed. If the Target Jet Cleaner changes ownership, the assembly manual must also be passed on.

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2 General information

2.1 Function

The DUNOS O50 F and O90 F Target Jet Cleaners are orbital target jet cleaners. They are driven by the cleaning medium. The machines are designed with little dead space and are produced from certified materials in Germany. The surfaces and their roughness are constantly monitored during production.

The cleaning medium, filtered according to the relevant regulations, is fed into the target jet cleaner. The target jet cleaner is either placed directly on the tank flange or placed in the tank via a support tube or lance. The connections are variable, standard connections are described in the chapter on “Technical data”. The inflowing medium is directed onto a turbine which drives the target jet cleaner with the downstream gear via a drive shaft. Due to the design of the orbital driven target jet cleaner, the outflowing jet of cleaning agent is applied to the container wall in the form of a horizontal eight with high impact. Depending on the type of coating to be cleaned, a user-defined amount of chemicals must be added to the cleaning medium.

Important: Only part of the cleaning medium passes through the gear unit. The main volume flow is routed via a bypass to the target jet head with the nozzles. This minimises pressure loss and ensures maximum volume flow for the nozzles.

The target jet cleaners can be operated with various nozzle diameters, this enables the devices to be perfectly adapted to the cleaning task at hand.

2.2 Proper use



The target jet cleaners may only be operated in closed containers. Operation outside of a container can lead to severe injury from the high impact of the emerging liquid jets. The cleaning agent would additionally be widely dispersed into the environment. Manual operation is forbidden!

Conversions, as well as modifications, to the target jet cleaners are forbidden and will always lead to the termination of warranty.

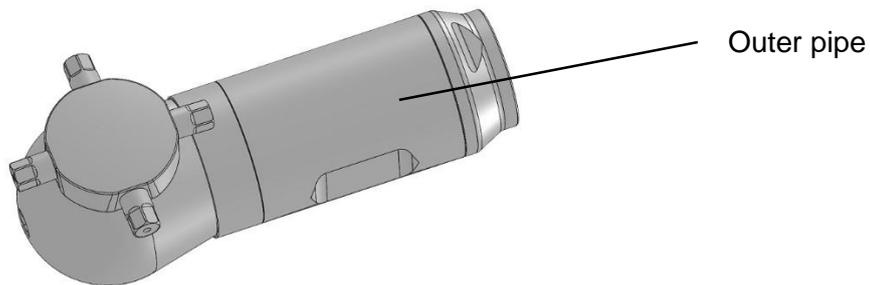
Another or derived usage is not deemed to be approved usage and AquaDuna GmbH & Co KG is not liable for the arising damage.

AquaDuna GmbH & Co. KG cannot issue a CE mark in accordance with the Machinery Directive; the target jet cleaners are incomplete machines.

The incomplete machinery must not be put into service until the machinery into which it is incorporated complies with the provisions of Directive 2006/42/EC, where this Directive applies to such machinery.

2.2.1 Component identification

Each target jet cleaner is marked with a serial number on the jacket tube.



2.2.2 Operating conditions



The following conditions must be observed in order to use the target jet cleaners in accordance with their intended purpose:

- Chapter 4 of this assembly manual must be observed!
- The target jet cleaners should be operated with a 500 µm prefilter.
- The permissible media temperature range for operating the target jet cleaners is 4-97°C.

The operator is responsible for observance of the conditions.

2.2.3 Hazards



Target jet cleaners are operated with high pressures. We therefore expressly point out that the instructions in this assembly manual must be observed. Damages resulting from non-compliance **will not be acknowledged** by the manufacturer.



The target jet cleaner may only be operated in the intended environment. Operation is only permitted in closed containers / rooms. Hazards due to rotating parts must be observed.



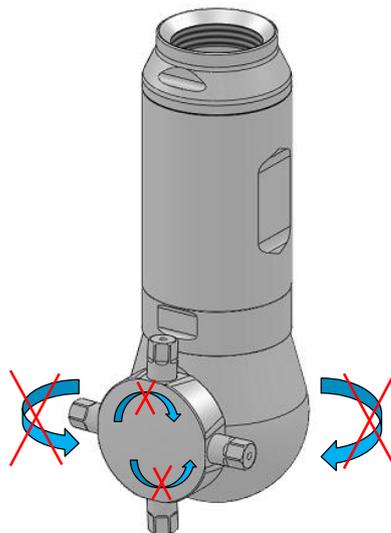
Danger of jamming between the nozzles and the unit body!



Assembly and operation of the target jet cleaners may only be carried out by instructed, authorised persons.



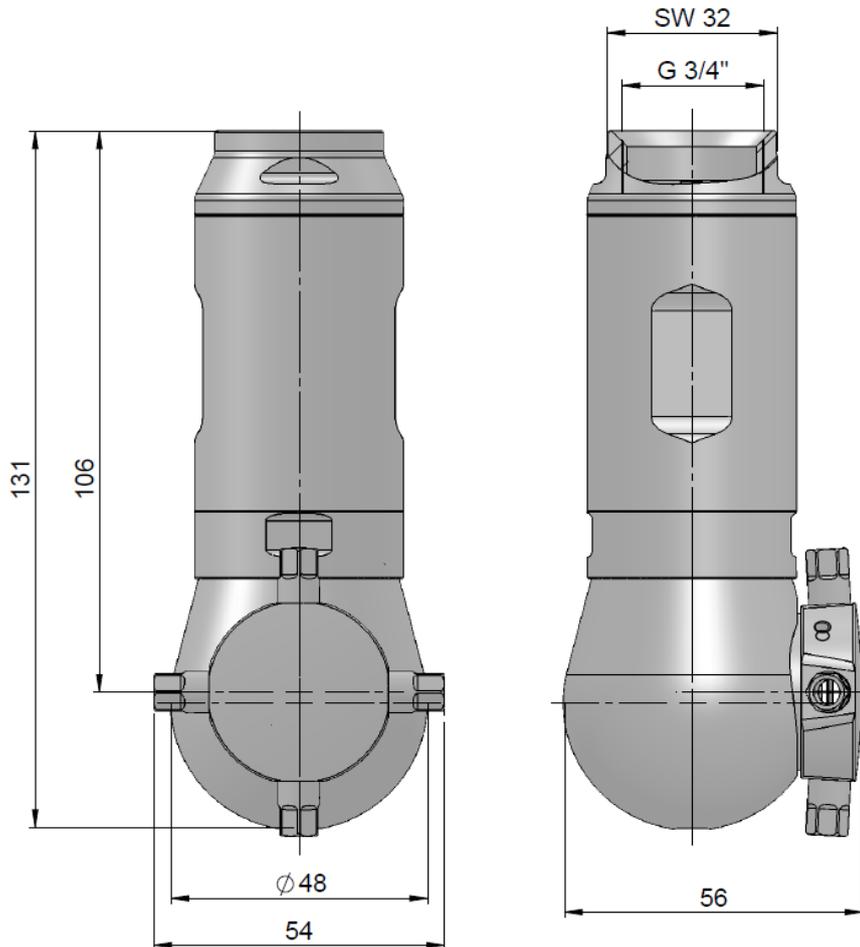
The target jet cleaner must not be twisted by force at the machine head or the nozzle disc. This can lead to destruction of the drive. → Image below.



3 Technical data

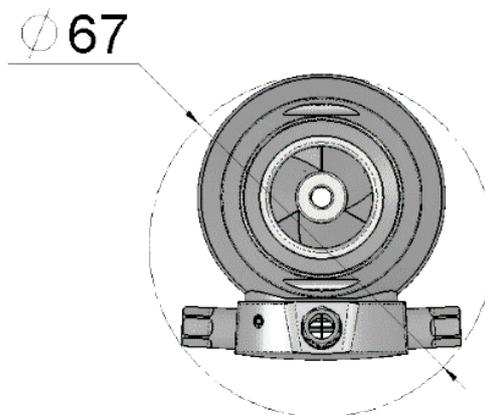
	DUNOS O50 F	DUNOS O90 F
Length:	131 mm	226 mm
Installation diameter:	65 mm	125 mm
Media connection:	G $\frac{3}{4}$ "	G1 $\frac{1}{2}$ "
Nozzle number:	2 - 4	2 - 4
Nozzle diameter	2 - 5 mm	5 - 8 mm
Working pressure:	3 - 12 bar	3 - 15 bar
Cleaning radius:	2.5 - 4.5 m	4 - 9 m
Spraying radius:	3.5 - 6 m	4 - 11 m
Weight:	0.8 kg	4.0 kg
Operating temperature:	4 - 97°C	
Sterilisation with steam:	up to 130°C	
Pre-filter:	500 µm	
Materials:	Stainless steel 1.4404 (316L) or higher PEEK TF 10 PEEK EPDM TFM 1600 Zirconium oxide ZrO ₂	
Accessories (optional):	Rotation monitoring Connection parts Special nozzles	

3.1 Measurements DO50

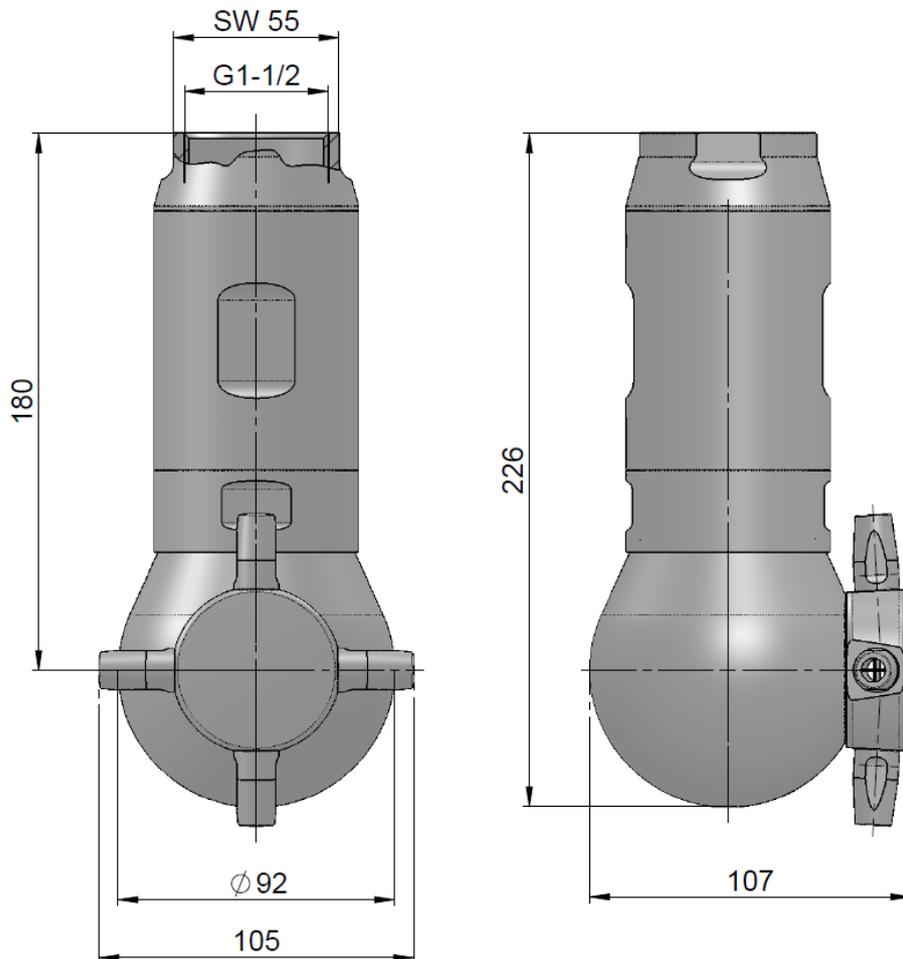


Dimensions may vary depending on medium connection and nozzle diameter.

Installation diameter:

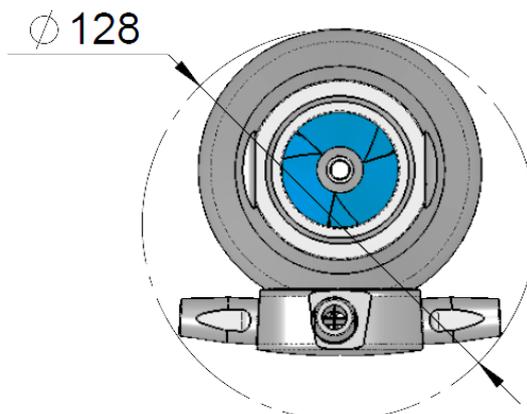


3.2 Measurements DO90



Dimensions may vary depending on medium connection and nozzle diameter.

Installation diameter:



4 Maintenance



Depending on the operating conditions, the target jet cleaner must be checked visually for external damage, rotation function and spray pattern at regular intervals.

Maintenance of the target jet cleaner by the manufacturer is recommended after 300 operating hours.

Depending on the prevailing operating conditions, such as operating pressure, temperature, properties of the medium or influence on the operator's plant, it may be necessary to carry out maintenance at an earlier point in time.

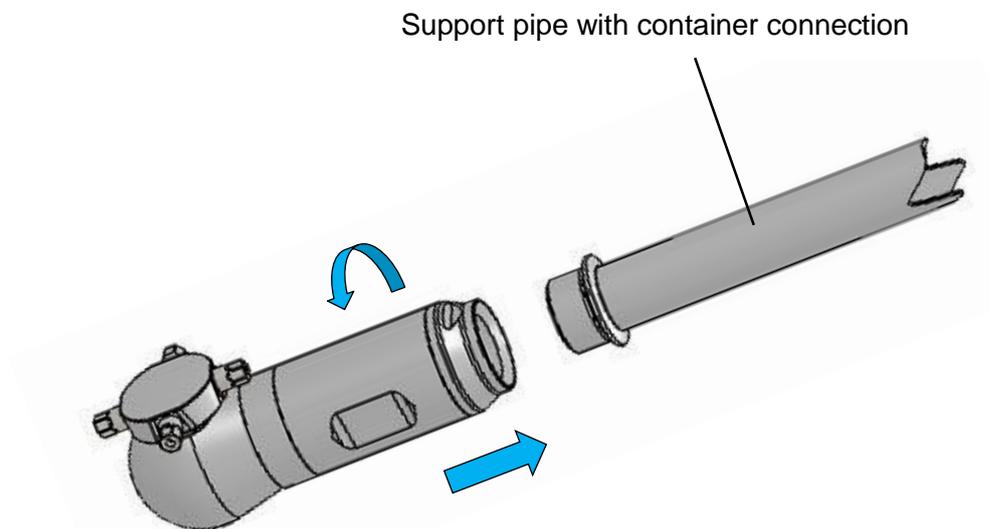
5 Installation and commissioning

5.1 Installation of target jet cleaners



Chapter 1.2.3. Attention must be paid to hazards.

The target jet cleaner is attached to the support tube via a thread. O-rings can be used to seal the thread.



5.2 Assembly and operating personnel

The operator of the target jet cleaners is obliged to train the assembly and operating staff. All persons handling rotating and spraying machines must have been instructed on the hazards connected with these machines.

Persons who are not registered as operating staff should not linger within the operating area of the machines. The operator must assure the necessary measures.

5.3 Commissioning

Observance of operating conditions is to be ensured.

If all pipelines or supply lines to the target jet cleaner are firmly connected and the shut-off valves are closed, the target jet cleaner is prepared for initial commissioning.

The prefilter in the supply piping to the target jet cleaner must be checked for proper function and the filter body (500 µm) must be installed.

Before commissioning, the supply piping to the target jet cleaner is to be rinsed through. Metallic impurities and welding residue may lead to damage to the target jet cleaner.

When the unit is put into operation for the first time, make sure that the supply line to the target jet cleaner has been vented, especially in the case of long supply lines. This avoids pressure shocks which could damage the target jet cleaner.

For hand-guided fittings, these are not to be opened abruptly in order to avoid pressure shocks.



For operation in automatically cleaning facilities, operators must be familiar with the shutdown process or the emergency stop procedure for the facility.



Hand-guided operation of the target jet cleaner is prohibited!

6 Integration into a plant

6.1 Automatic control

If the target jet cleaners are integrated into an automatically running facility, then it is to be ensured that the target jet cleaner can be monitored during its functioning. This can be done by means of rotation monitoring or a visual check. The function check is to be documented during visual inspections.

6.2 Manual control

If the target jet cleaners are to be controlled by hand-guided means, then it must be observed that pressure shocks are avoided. The servicing elements are thus to be opened and closed slowly. If steam is applied to the target jet cleaner, it must be ensured that the temperature does not exceed the specified limits. Monitoring of the target jet cleaner must be ensured.

6.3 Emergency shutdown of the plant



To be able to bring about an emergency shutdown of the target jet cleaner, it is essential that the operators of the facility are familiar with the facility's design.

It is vital, that training in emergency shutdown be given and the necessary elements for emergency shutdown be known. The training of those entrusted with cleaning is to be documented. All personal injury and material damage resulting from incorrect operation or incorrect use is the responsibility of the plant operator.

7 Transportation

7.1 Scope of delivery



Included within the scope of delivery are the target jet cleaner and this assembly manual. The design option for the target jet cleaner supplied can be found in the delivery documents.

7.2 Transportation and packaging

Our products are manufactured, assembled and checked with the greatest diligence. However, should there be any grounds for complaint, we will of course rectify these in the context of our warranty. Even after the warranty period, we will be glad to assist you.



For all deliveries, it is fundamental that the packing slip be compared with the scope of delivery. After establishing that everything is present, the goods are to be checked for damage.

Should damage be evident, then a note made on the delivery papers is vital. The damage must be counter-signed by the carrier.

For returns, either the packaging is to be retained or such packaging is to be chosen, so that the equipment does not become damaged.

8 Quality assurance

Quality of construction, manufacture, assembly, final inspection and checking are second nature to us. It represents an absolute precondition for the enduring, efficient and high-value production of our sophisticated products. To ensure our high quality standards, we use an IT-supported quality assurance system that is ISO 9001:2015 certified. In addition, all our products undergo a final functional test (100% check). We thereby ensure that only 100%-reliable products are allowed to leave our premises.

9 Disposal

All materials used for the production of the target jet cleaner are not harmful to the environment. These are mainly stainless steel, EPDM, ZrO₂ and PEEK. These materials are able to be disposed of in the manner intended for them.



WARNING!! It is to be ensured that no contamination from substances during operation is still present. In this regard, corresponding substances are to be used in rinsing those parts to be disposed of.

10 Annex

10.1 Symbols used



This symbol indicates an imminent danger, which can lead to severe injuries or death.



This symbol indicates a potential danger, which can lead to severe injuries or death.



This symbol indicates a potential danger, which can lead to mild to severe injuries.



This symbol indicates a potential danger, which can lead to damage to property.



Important note.

10.2 Dunos O50 F VD performance values

Pressure	Flow rate		
	[bar]	[l/min]	m ³ /h
1	10.5	0.6	Connection 3/4" Nozzle number 4 Nozzle diameter 2 mm
2	12.4	0.7	
3	15.5	0.9	
4	17.5	1.1	
5	19.5	1.2	
6	21.4	1.3	
7	23.1	1.4	
8	24.6	1.5	

Pressure	Flow rate		
	[bar]	[l/min]	m ³ /h
1	11.4	0.7	Connection 3/4" Nozzle number 4 Nozzle diameter 2.5 mm
2	15.8	0.9	
3	19.5	1.2	
4	22.2	1.3	
5	25	1.5	
6	27.3	1.6	
7	29.4	1.8	
8	31.5	1.9	

Pressure	Flow rate		
	[bar]	[l/min]	m ³ /h
1	19.9	1.2	Connection 3/4" Nozzle number 4 Nozzle diameter 3 mm
2	24.2	1.5	
3	29.3	1.8	
4	33.4	2.0	
5	37.1	2.2	
6	40.7	2.4	
7	43.6	2.6	
8	46.4	2.8	

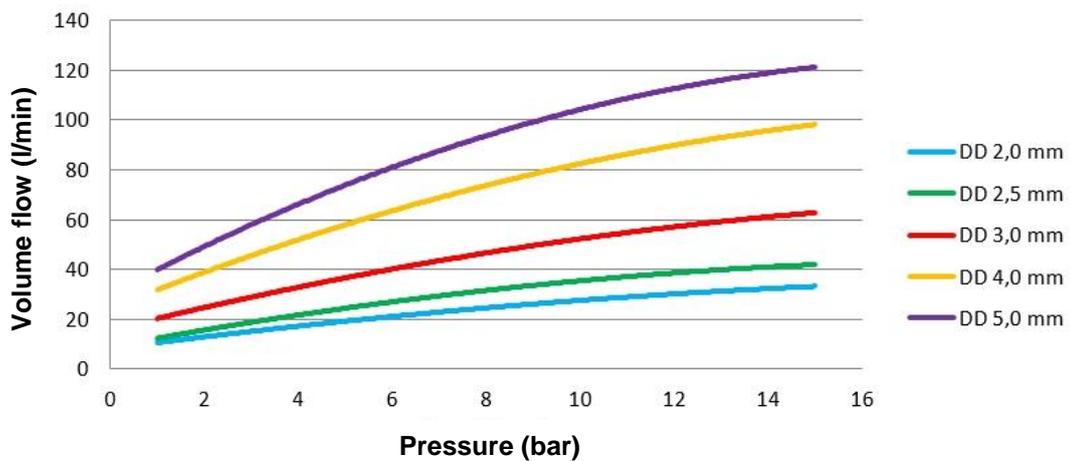
Pressure [bar]	Flow rate	
	[l/min]	m ³ /h
1	28	1.7
2	40.1	2.4
3	47.3	2.8
4	53.6	3.2
5	59.3	3.6
6	64.1	3.8
7	68.9	4.1
8	72.9	4.4

Connection 3/4"
Nozzle number 4
Nozzle diameter 4 mm

Pressure [bar]	Flow rate	
	[l/min]	m ³ /h
1	35.4	2.1
2	49.1	2.9
3	60.6	3.6
4	69.1	4.1
5	76.1	4.6
6	82.3	4.9
7	87.8	5.3
8	92.6	5.6

Connection 3/4"
Nozzle number 4
Nozzle diameter 5 mm

Volume flow - pressure diagram



10.3 Dunos O90 F VD performance values

Pressure	Flow rate		
	[bar]	[l/min]	m ³ /h
1	28.2	1.7	Connection 1 1/2" Nozzle number 4 Nozzle diameter 4 mm
2	39.5	2.4	
3	47.6	2.9	
4	54.4	3.3	
5	60.3	3.6	
6	66.5	4.0	
7	71.2	4.3	
8	76.3	4.6	

Pressure	Flow rate		
	[bar]	[l/min]	m ³ /h
1	51.4	3.1	Connection 1 1/2" Nozzle number 4 Nozzle diameter 5 mm
2	61.6	3.7	
3	75.6	4.5	
4	85.5	5.1	
5	95.7	5.7	
6	106.4	6.4	
7	115.1	6.9	
8	122.3	7.3	

Pressure	Flow rate		
	[bar]	[l/min]	m ³ /h
1	59.2	3.6	Connection 1 1/2" Nozzle number 4 Nozzle diameter 6 mm
2	82.6	5.0	
3	101.8	6.1	
4	117.1	7.0	
5	130.5	7.8	
6	142.6	8.6	
7	153.5	9.2	
8	164.4	9.9	

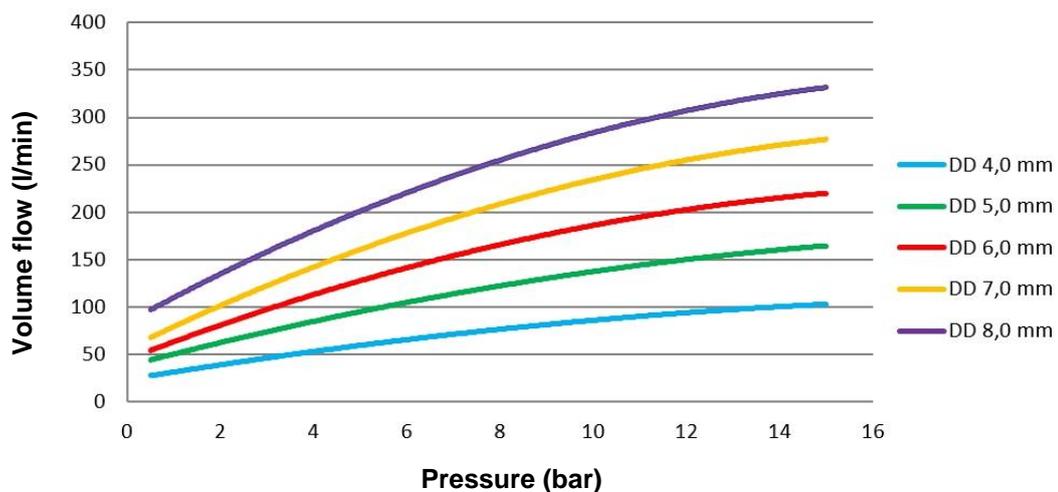
Pressure [bar]	Flow rate	
	[l/min]	m ³ /h
1	74.4	4.5
2	103.8	6.2
3	128.4	7.7
4	147.2	8.8
5	162.9	9.8
6	179.8	10.8
7	194.1	11.6
8	208.2	12.5

Connection 1 1/2"
Nozzle number 4
Nozzle diameter 7 mm

Pressure [bar]	Flow rate	
	[l/min]	m ³ /h
1	100.2	6.0
2	137.7	8.3
3	169.8	10.2
4	191.1	11.5
5	207.6	12.5
6	224.3	13.5
7	240.2	14.4
8	253.6	15.2

Connection 1 1/2"
Nozzle number 4
Nozzle diameter 8 mm

Volume flow - pressure diagram



11 Masthead

Original Assembly Manual

Dunos O50 F / Dunos O90 F

May 2020 version

Revision 0

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12 Declaration of Incorporation

Original Declaration of Incorporation (translated from the German)

Manufacturer / Authorised representative	AquaDuna GmbH & Co. KG Ferdinand-von-Steinbeis-Ring 31 D-75447 Sternenfels, GERMANY
Authorised representative for the compilation of the technical documentation	Frank Zeitler AquaDuna GmbH & Co. KG Ferdinand-von-Steinbeis-Ring 31 D-75447 Sternenfels, GERMANY

Product description

DO - target jet cleaners

The manufacturer declares that the above mentioned product is a partly completed machine according to the Machinery Directive 2006/42/EC. The above mentioned product is exclusively intended for installation in a machine or plant. For this reason, the product does not yet comply with all requirements of the Machinery Directive.

The specific technical documentation referred to in Annex VII Part B has been established. The person authorised to compile the technical documentation may, upon a justifiable request, present the documentation for inspection within a reasonable time.

The partly completed machinery must not be put into service until it has been established that the installation into which this partly completed machinery is to be incorporated complies with the provisions of the Machinery Directive.

The above mentioned product meets the requirements of the following directives and harmonised standards:

- Machinery Directive 2006/42/EC
- DIN EN ISO 12100:2011-03

Sternenfels, 15/05/2020



Frank Zeitler
Managing Director