

IKEUCHI

Air nozzles



“The Fog Engineers”

IKEUCHI EUROPE B.V.



The Sound of Silence

Air, wind, sound, noise...

The world lives thanks to the air of the atmosphere that surrounds us.

The wind has spread the pollen and seeds that have created our nature throughout our world. Sound has accompanied the world since its existence and allows communication between the various beings that inhabit it. However, noise, namely noise pollution, is something that human activity has increased dramatically in recent years.

Thus, silence has become a scarce commodity in our lives.

Industrial, economic and cultural development, urban expansion, unbridled increase of car parks, amongst other reasons, have contributed to the transformation of a wide range of sounds, rich in their beginnings, into noise pollution.

IKEUCHI, "The Fog Engineers", aware of this global problem, has developed systems to try to mitigate noise in applications in which the use of compressed air is necessary in industry, maintaining and even improving their effectiveness.



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Brand motivation



Fog, spray and tiny particles of water in the environment have always been a factor associated with our lives. Crops grow by absorbing water from the environment and soil. People need certain levels of humidity to be able to live comfortably. Therefore, in IKEUCHI, we focus on designing appropriate products for each process, providing the amount of spraying necessary to maximize its performance.

IKEUCHI, leading Japanese manufacturer, places quality as a fundamental pillar.

Comprehensive controls in production and various quality tests are carried out on the nozzles manufactured to ensure that only those that meet the quality standards reach customers. For this reason it is possible to guarantee the spray angles and spray capacities of the nozzles (hydraulic).

IKEUCHI is involved in customer applications giving individual solutions.

IKEUCHI is involved in the processes and applications of each client, offering customized solutions. This involvement in different processes and industries increases the company's knowledge in different manufacturing processes and applications helping to create more precise and innovative solutions.

IKEUCHI story



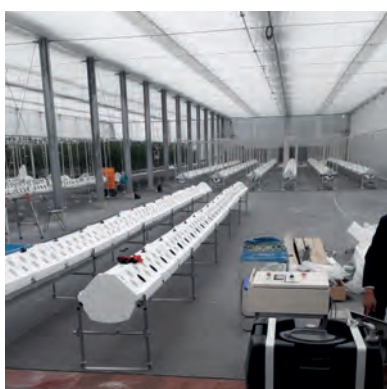
IKEUCHI was founded in 1954 by opening its first factory in the city of Kure in Japan. The growth as a brand was determined thanks to an exhaustive study of the market backed by excellent manufacturing capacity, thus offering the products that customers demanded, such as ceramic nozzle tips. A clear manifestation of the growth was the opening of two new factories in the cities of Nishiwaki and Kure in a short period of time.



IKEUCHI is divided into four departments: cooling division, agriculture division, environment division and humidification division. This categorization offers the possibility of excellent customer service.

After consolidating itself as a leader in the Japanese market, IKEUCHI expanded to the world market by opening offices and factories in different locations. There are currently 7 subsidiary companies, 4 factories in operation and 12 sales offices.

Innovation

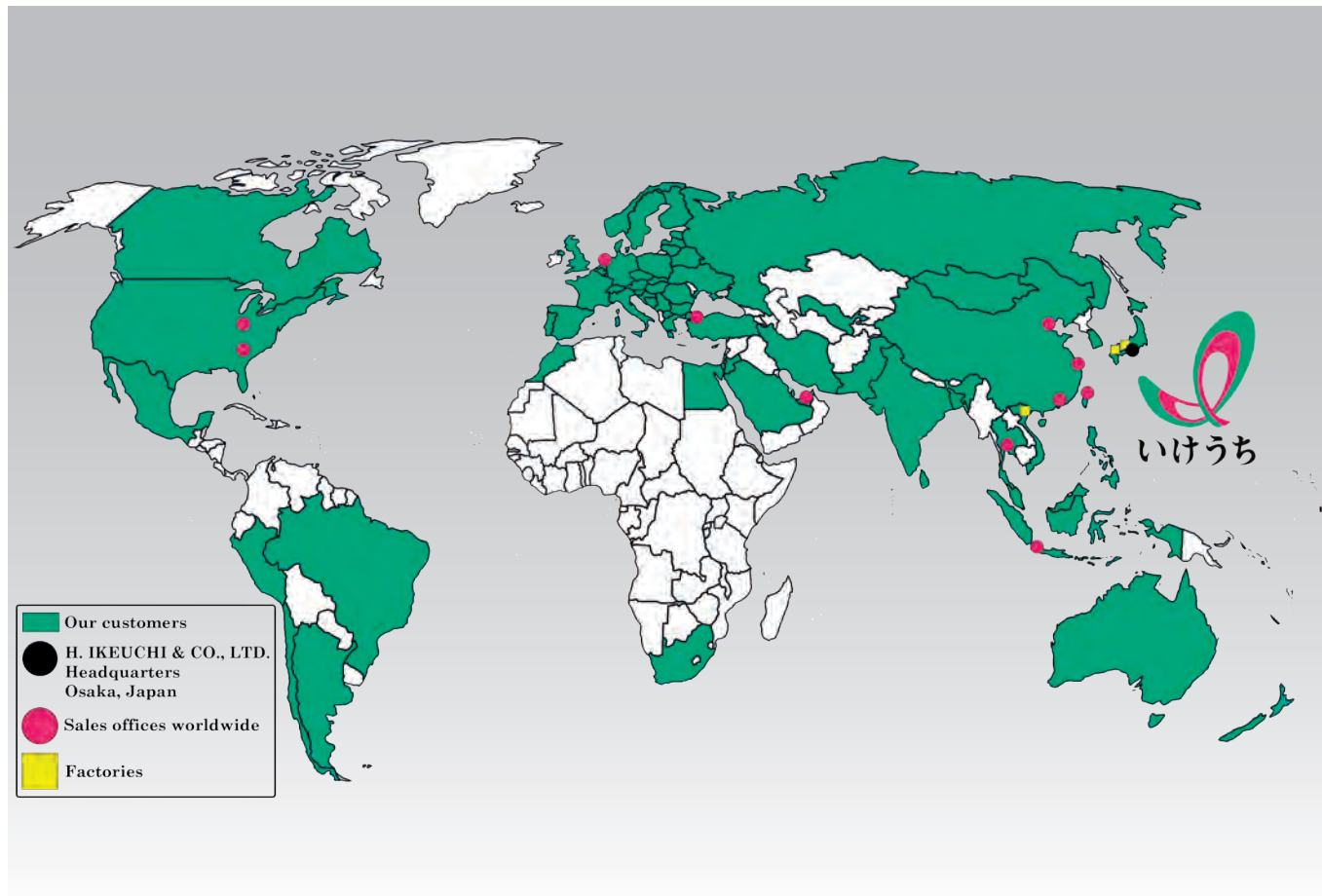


IKEUCHI knows first-hand that product research and development guarantee a prosperous future for customers and the brand. We are the first company to be able to manufacture nozzles with ceramic tips to improve performance in processes that spray chemical products.

There are currently several open research projects of new products in collaboration with universities and different entities. In the different researches, engineers focus on improving existing processes by creating new spraying techniques or finding new applications not known to date.

The creation of knowledge and constant innovation lead to the development of new products, defining the market and making customers grow.

IKEUCHI organization distribution



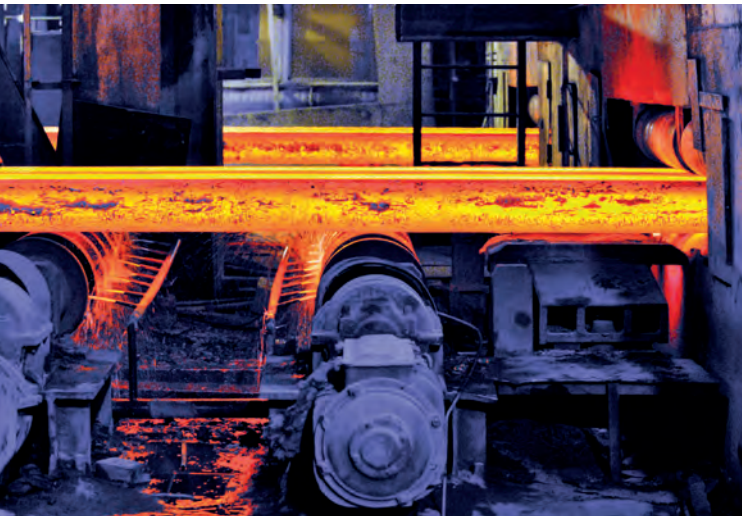
In 2008, **IKEUCHI EUROPE B.V.** has established its headquarters in Amsterdam (the Netherlands) to cover the European as a subsidiary of IKEUCHI Japan, **H. IKEUCHI & CO., LTD.**

After a solid and constant growth for 10 years, in 2018 IKEUCHI EUROPE B.V. moves its central offices to Breukelen in the Netherlands where better access and wider facilities improve opportunities to the company's future growth expectations.

Pursuing these growth aspirations, we have been collaborating with distributors in several countries in Europe to promote our high quality products and serve customers with a local service.



Application industries



Steel

The IKEUCHI nozzles for compressed air and low pressure air nozzles improve the efficiency and noise level in the different iron and steel processes, thus saving air and energy.

- Cooling
- Dry
- Cleaning
- Scanning sensors



Metal

In many machine processes it is necessary to use compressed air manually. With the use of IKEUCHI nozzles, it is possible to improve efficiency and reduce the noise level.

- Cleaning
- Part drive
- Particle removal
- Cooling



Pharmaceutical

In an extremely protected working environment, it is required to control and reduce the noise level, like during the selection and packaging processes in hygienic environments. Therefore, it is recommended to use IKEUCHI nozzles as they are manufactured with high quality standards and in various materials..

- Packaging
- Alignment
- Cleaning
- Humidification

Application Industries

Food

IKEUCHI nozzles, with their low noise level, increase the quality of the work environment in continuous processes with the need for compressed air for different applications.

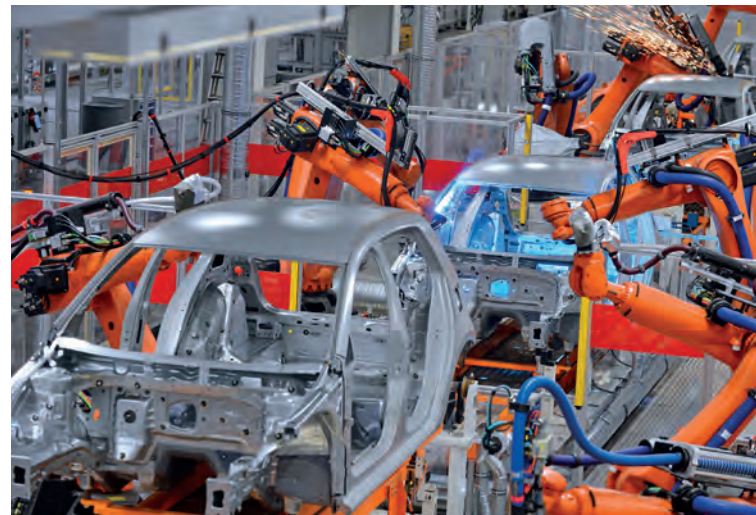
- Cleaning
- Expulsion of defects
- Alignment
- Packaging



Automotive

The use of compressed air is important in different applications in sensitive manufacturing processes. With IKEUCHI air nozzles, high efficiency and reduced air consumption are achieved.

- Cleaning
- Welding coolinga
- Defect expulsion



Packaging/Paper/Bottling

Installing IKEUCHI nozzles increases process quality in the manufacture of intermediate materials and in high-speed processes

- Drying roller cleaning
- Defect expulsion



Savings in compressed air installations in industry



What is compressed air?

Compressed air is a form of energy storage due to its ability to perform work when decompressed. The production of compressed air is carried out, for the most part, with electric power by means of a compressor.

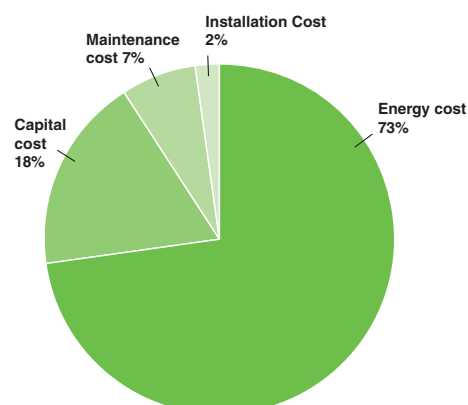
Where is compressed air used?

The vast majority of industrial companies use compressed air in some way or within some equipment, i.e. for surface drying or cleaning.

“In the industry, more than 10% of the electricity used goes to the production of compressed air, varying according to the sector, which in some cases can reach up to 30% of the electrical energy used”.

After assimilating the total cost of a compressed air system during its first 10 years of operation, it is understood that 73% comes from the electrical energy necessary for its operation. The rest of the costs includes the initial investment, maintenance and installation costs.

The energy efficiency of a compressed air installation is very low, since of the total energy provided only



between 8% and 10% becomes useful energy capable of performing a job. The rest is lost in compression, regulation, cooling, dehumidification and leakage in equipments and pipes.

In addition to the compressed air generated by the compression units, it is estimated that 50% is used in nonproductive demand components such as leaks, inappropriate uses of compressed air and artificial demand (excess of the level of air pressure at which our compressed air installation is adjusted above the actual values necessary for it to function properly).

“It is important to study how to improve and reduce its energy consumption, since a large amount of electricity is required to run the installation.”

How to reduce a system’s operating costs?

When it comes to saving on operating costs, there are several measures that can be taken. An installation can be divided into two fundamental parts: one is production, which includes compressors and air treatment; the other is demand, which includes distribution, storage systems and end-use equipment. The correct combination between production and demand leads to a decrease in costs.

There are several ways to make an installation more efficient and reduce its operating costs, such as energy recovery for other functions, pressure reduction, decrease in the number of leaks and optimisation of operations through a correct control and regulation system.

Savings opportunities in a compressed air installation:

Leak control

Installations can have different types of leaks, which can be prevented by performing frequent maintenance. An installation is considered to be in good condition when leaks constitute 10% of production.

Compressor air intake control

For greater compressor performance, it is important that the sucked air is clean and cold. Since the specific volume of air depends on temperature, the colder it is, the more air fits in the compressor, thus improving its performance.

Thermal energy recovery

Because the compression process produces heat, it can be extracted by a cooling circuit and used, for example, to heat the ship or for some other specific process.

Inefficient applications

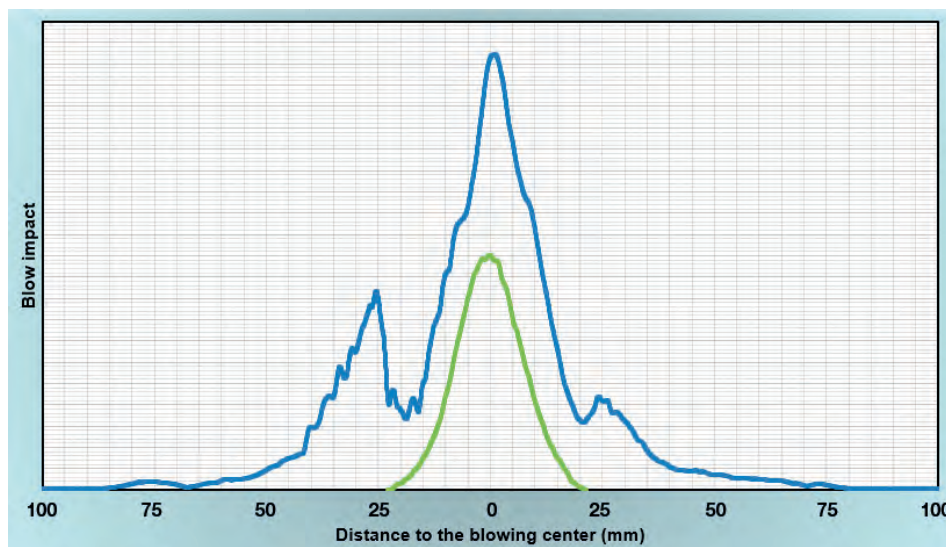
There are parts of the installation that are obsolete or whose operating cost could be reduced with a small investment. This is the case of air nozzles: using nozzles designed for each application instead of a tube increases system efficiency and cuts costs.



Why use IKEUCHI air nozzles

IKEUCHI technical air nozzles have been developed to maximise blowing efficiency. The wide range of models within each series offers the possibility of choosing the most suitable nozzle for each application, optimizing the blowing force and air flow required. This complete design contributes to decreased compressed air costs and a better control of the blowing accuracy of each application.

When the blowing is carried out with a free exhaust pipe, the distribution of the blowing force is irregular and the flow is turbulent, resulting in inefficient blowing. This inefficient spraying involves irregular blowing, reducing the quality of each application. In addition, the problem is increased in multiple nozzle configurations as it is not possible to determine a homogeneous flow along the blowing length.



The graph shows the difference in the distribution of the blowing force between a blue graph open tube and a green graph TF-R series nozzle.

In addition, another great advantage of the use of IKEUCHI technical air nozzles is that they have a lower consumption of compressed air flow compared to free exhaust pipes, thus reducing the installation's operating costs. Compared to a 1/4" free exhaust pipe (free passage diameter of 9.7 mm).

The IKEUCHI model TF-R technical nozzles are able to reduce the flow of compressed air by 79-91%.

As our air nozzles offer a uniform flow distribution, therefore improving the installation's efficiency. Its return on investment time is very short.

BLOWING OUT OF EXHAUST (5 bar)

Tube size	Air consumption (NL/min)	Noise level (dB(A))
1/8"	1,550	102
1/4"	4,170	109
3/8"	4,890	109
1/2"	5,600	116

NOISE REDUCTION WITH IKEUCHI NOZZLES

Model	Replace tube	Reduction (dB)	Noise level reduction	Flow reduction	Flow reduction (%)
1/8M TF-R 8-008 S316-IN	1/8"	25	-83 %	1,330	86 %
1/8M TF-R 8-010 S316-IN	1/8"	19	-73 %	1,190	77 %
1/4M TF-R 8-010 PP-IN	1/4"	26	-84 %	3,810	91 %
1/4M TF-R 8-010 S316-IN	1/4"	26	-84 %	3,810	91 %
1/8M TF-R 8-012 S316-IN	1/8"	14	-61 %	1,010	65 %
1/4M TF-R 8-012 S316-IN	1/4"	21	-77 %	3,630	87 %
1/8M TF-R 8-014 S316-IN	1/8"	11	-53 %	830	54 %
1/4M TF-R 8-014 S316-IN	1/4"	18	-71 %	3,450	83 %
1/4M TF-R 8-016 S316-IN	1/4"	16	-67 %	680	44 %
1/8M TF-F 24-8-010 PPS-IN	1/8"	20	-75 %	1,210	78 %
1/4M TF-FS 42-16-010 PPS	1/4"	24	-82 %	3,510	84 %
1/4M TF-F 42-16-010 PPS	1/4"	25	-83 %	3,515	84 %
1/4M TF-F 42-16-008 S316-IN	1/4"	31	-88 %	3,745	90 %
1/4M TF-F 42-16-010 S316-IN	1/4"	25	-83 %	3,515	84 %
1/4M TF-F 42-16-012 S316-IN	1/4"	23	-80 %	3,245	78 %
3/8M TF-F 121-46-010 PPS	3/8"	23	-80 %	3,060	63 %
1/4M TF-F 50-16-012 S304	1/4"	22	-79 %	3,135	75 %
TF-R 36-012	1/2"	20	-75 %	3,380	60 %
1/4M HF 7-012 S303	1/4"	26	-84 %	3,745	90 %
1/4M HF 14-010 S303	1/4"	21	-77 %	3,550	85 %
1/4M HF 19-010 S303	1/4"	19	-73 %	3,320	80 %
1/4M VZ 150 S303	1/4"	35	-89 %	3,940	94 %
1/4M VZ 200 S303	1/4"	33	-89 %	3,868	93 %
1/4M VZ 250 S303	1/4"	31	-88 %	3,796	91 %
1/4M VZ 300 S303	1/4"	29	-87 %	3,724	89 %
1/4M VZ 350 S303	1/4"	27	-85 %	3,652	88 %
1/4M VZ 400 S303	1/4"	25	-83 %	3,580	86 %
1/4M VZ 450 S303	1/4"	23	-80 %	3,508	84 %
1/4M VZ 500 S303	1/4"	21	-77 %	3,436	82 %
3/8M VZ 550 S303	3/8"	19	-73 %	4,067	83 %
3/8M VZ 600 S303	3/8"	17	-69 %	3,985	81 %
3/8M VZ 650 S303	3/8"	16	-67 %	3,918	80 %
3/8M VZ 700 S303	3/8"	14	-61 %	3,843	79 %
3/8M VZ 750 S303	3/8"	13	-59 %	3,764	77 %
3/8M VZ 900 S303	3/8"	11	-53 %	3,543	72 %
3/8M VZ 1130 S303	3/8"	9	-47 %	3,212	66 %
1/8M CCP 1.0A S303	1/8"	31	-88 %	1,500	97 %
1/4M CCP 1.0A S303	1/4"	38	-88 %	4,120	99 %
1/8M CCP 1.5A S303	1/8"	25	-83 %	1,430	92 %
1/4M CCP 1.5A S303	1/4"	32	-88 %	4,050	97 %
1/8M CCP 2.0A S303	1/8"	19	-73 %	1,344	87 %
1/4M CCP 2.0A S303	1/4"	26	-84 %	3,964	95 %
1/8M CCP 2.5A S303	1/8"	13	-59 %	1,250	81 %
1/4M CCP 2.5A S303	1/4"	20	-75 %	3,870	93 %

Noise Regulations



NORMATIVE NOISE LEVEL AND HAZARDOUS USAGE OF FREE EXHAUST

What is sound?

Sound is an oscillation in air pressure or other means, which can be perceived by the human ear. The number of air pressure oscillations per period of time defines its frequency, while the magnitude of the average pressure defines sound power and intensity.

The frequency of audible sounds is between 20 Hz, bass sounds, and 20,000 Hz, high-pitched sounds, and their intensity ranges between 0 and 140 dB. The frequency of normal conversation ranges between 250 Hz and 4,000 Hz, while words are emitted at an intensity ranging between 30 and 70 dB(A).

Can it become a problem in the working environment?

According to data collected in different surveys on working conditions carried out by the National Occupational Health and Safety Institute, exposure to continued noise can cause irreparable health problems.

It is estimated that 37% of workers are exposed to noise considered annoying, high or very high.

What problems can extended exposure to loud noises cause?

It can cause permanent hearing loss known as **induced hearing or hearing loss due to noise exposure** and implies that hearing gradually deteriorates as a result of exposure to loud noises.

In noise-induced hearing loss, inner ear cells are damaged by exposure to loud noises. Consequently, the ability of cells to collect and transmit sounds to the brain is reduced. Other manifestations of hearing damage are: hearing fatigue, deafness, conversational deafness and acute acoustic trauma.

How to prevent noise-induced hearing loss?

Many people wonder if it is possible to recover from noise-induced hearing loss. The answer unfortunately is no. Once the inner ear cells are damaged by exposure to noise, they cannot recover.

Prevention is the only solution to prevent hearing loss. It can be prevented by reducing the level of noise to which the person is being exposed or by reducing the exposure time to them.

There are national, European and international regulations that regulate the noise levels to which a person can be exposed for a period of time.

How is sound measured?

Since the human ear does not have the same sensitivity for all frequencies, this specific aspect has to be taken into account when making a noise measurement. For this reason, measurement parameters, that follow approximately the same law as the ear in terms of sensitivity as a function of frequency, have been established.

The decibel (dB) is the unit used to measure the intensity of sound. The human ear does not perceive the sound at different frequencies in the same way. To take into account the fact that the human ear perceives especially severe or high-pitched sounds as less intense, **noise is usually measured in decibels with weighting A [dB (A)]**.

The decibel is a deceptive unit, as **small differences in the number of decibels represent a very important variation in the amount of transmitted energy, and therefore in how aggressively it is perceived by humans**. For example, the total dB that is perceived when two 30 dB sounds are heard is not 60 dB, because the combination of individual sound levels is not their sum. In fact, their sound equivalence increases only by 3 dB, so the two sounds together correspond to 33 dB.

The level of continuous equivalent sound pressure weighted $L_{Aeq,T}$ is used in order to measure **the noise level to which the ear is exposed for a certain period of time**. This measurement is based on finding a continuous noise level dB(A) which would produce the same sound energy as the different measurement sounds during the same period of time, i.e. as an average value of sound energy during that period of time.

APPLICABLE LEGISLATIVE AND REGULATORY FRAMEWORK

The regulatory section of the European Union for the protection of workers against risks related to noise exposure is included in Directive 2003/10/EC, which determines a maximum level of equivalent continuous exposure weighted in an 8-hour working day of 87 dB(A). ($L_{Aeq, 8} = 87 \text{ dB(A)}$).

As an example, in Spain, the applicable regulations on the protection of workers' health and safety against risks related to noise exposure are included in **RD 286/2006**. RD 286/2006 establishes a maximum daily weighted equivalent continuous exposure level of 87 dB (A) ($L_{Aeq,d} = 87 \text{ dB(A)}$) with peak levels of 140 dB(A). This means that a worker can be exposed for a maximum of 8 hours at a weighted equivalent continuous exposure level of 87 dB(A). RD 286/2006 establishes some parameters to be complied with to reduce the risk of problems due to noise exposure: training for workers, an annual evaluation of noise exposure, use of individual hearing protectors and signalling in the relevant areas, etc.

The American Occupational Safety and Health Administration (OSHA) establishes the limits considering a weighted average time of a worker during a workday of 8 hours of 90 dBA ($L_{Aeq, 8} = 90 \text{ dB(A)}$).

The American OSHA standard also sets the halving levels at 10 dB(A). This means that an increase of 10 dB(A) would mean a reduction in exposure time to noise by half. For instance, with a weighted average of 92 dB(A), workers can only be exposed to this noise level for 4 hours.

The American National Institute for Occupational Safety and Health (NIOSH) recommends that all worker noise exposure should be kept below the threshold of 85 dB(A) for eight hours to minimise the risk of hearing loss. NIOSH also recommends a 10 dB(A) halving level, which means that each 10 dB(A) increase doubles the amount of noise and halves the exposure time to it.

Research and development



IKEUCHI knows first-hand that research and product development guarantee a prosperous future for customers and the brand. Following the achievements in the line of products for liquid spraying, such as the manufacturing of the first nozzle with a ceramic tip, air nozzles have been designed with the purpose of improving industrial processes.

An exhaustive study of fluid dynamics has resulted in the launch of an exclusive range of technical air nozzles that reduce air consumption, noise levels and improve their efficiency, resulting in greater savings in installations and optimisation of working conditions.

At present, IKEUCHI has several open research lines for new products in collaboration with universities and different entities. In the different investigations, engineers focus on improving existing processes by creating new spraying techniques or finding new applications unknown to date.

The creation of knowledge and constant innovation leads to the development of new products, defining the market and boosting the number of customers.



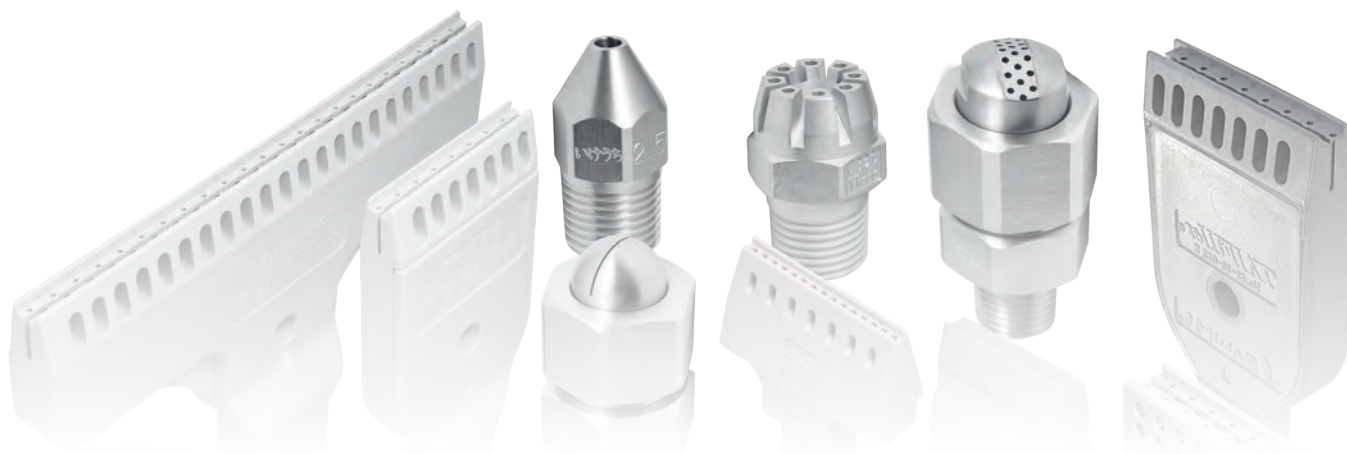
**Lets us improve
the working
environment!**

Quality

IKEUCHI Japan complies with ISO 9001 in its factories in Japan in Nishiwaki and Kure.

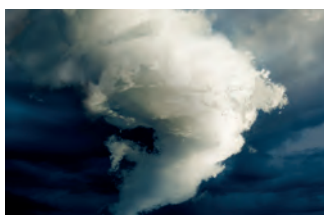
  <p>Certificate of Registration</p>	  <p>Appendix to Certificate of Registration</p>
<p align="center">H.IKEUCHI & CO.,LTD.</p> <p>This is to certify that the above organization's Quality Management System conforms to Requirements of the following standard within the scope described in attached Appendix, and is registered by the JMAQA REGISTRATION CENTER as the result of the assessment.</p> <p>Applicable Standard : JISQ9001:2015(ISO9001:2015) Registration No. : JMAQA-2490 Registration Date : 13 March, 2012 Registration Expiry Date : 12 March, 2021 Registration Revised Date : 6 February, 2018</p> <p align="center">JAPAN MANAGEMENT ASSOCIATION QA REGISTRATION CENTER</p> <p>Senior Executive Management </p> <p align="center">3-1-22 Shiba-Koen Minato-ku Tokyo 105-8522, Japan <small>This is valid to be used in conjunction with attached Appendix.</small></p>	<p align="center">Appendix No. : JMAQA-2490-1 Registration No. : JMAQA-2490</p> <p align="center">H.IKEUCHI & CO.,LTD. 1-13-15, Aomai, Nishi-ku, Osaka, Japan</p> <p>Registration Scope: ①Development, Design, Manufacturing, Sales and Construction of Spray Nozzles and Nozzle-related Systems ②Development, Design, Manufacturing, Sales and Construction of Industrial Air Conditioning Humidification Systems ③Development, Design, Manufacturing, Sales and Construction of Cooling Systems ④Development, Design, Manufacturing, Sales and Construction of Environmental Cooling Systems ⑤Development, Design, Manufacturing, Sales and Construction of Fog Cultivation Systems for Agriculture and Livestock and Production and Sales of Vegetables and Fruits related of Them ⑥After-sale Service to the Above</p> <p>*The following sites are included.* ①Development, Design, Manufacturing, Sales and Construction of Spray Nozzles and Nozzle-related Systems ②Development, Design, Manufacturing, Sales and Construction of Industrial Air Conditioning Humidification Systems ③Development, Design, Manufacturing, Sales and Construction of Cooling Systems ④Development, Design, Manufacturing, Sales and Construction of Environmental Cooling Systems ⑤Development, Design, Manufacturing, Sales and Construction of Fog Cultivation Systems for Agriculture and Livestock and Production and Sales of Vegetables and Fruits related of Them ⑥After-sale Service to the Above HEAD OFFICE: 1-13-15, Aomai, Nishi-ku, Osaka, Japan</p> <p>(Sales and Construction of Spray Nozzles and Nozzle-related Systems) ①Development, Design, Manufacturing, Sales and Construction of Industrial Air Conditioning Humidification Systems ②Development, Design, Manufacturing, Sales and Construction of Cooling Systems ③Development, Design, Manufacturing, Sales and Construction of Environmental Cooling Systems ④Development, Design, Manufacturing, Sales and Construction of Fog Cultivation Systems for Agriculture and Livestock and Production and Sales of Vegetables and Fruits related of Them ⑥After-sale Service to the Above TOKYO BRANCH OFFICE: 1-9-15, Sogame, Minato-ku, Tokyo, Japan</p> <p>(Sales and Construction of Spray Nozzles and Nozzle-related Systems) ⑥After-sale Service to the Above SAITAMA OFFICE: 4-20-1, Minamikuji, Omya-ku, Saitama, Japan YOKOHAMA OFFICE: 2-20-4, Torayura-cho, Kanagawa-ku, Yokohama, Kanagawa, Japan MAZDA OFFICE: 1-14-1, Edono, Maeda-ku, Nagoya, Aichi, Japan HUDDONDA OFFICE: 1-23, Kiyoharacho, Minami-ku, Hiroshima, Japan FUKUOKA OFFICE: 2-1, Sanno, Hakata-ku, Fukuoka, Japan SENDAI BRANCH OFFICE: 1-9-10, Kamaoka, Aoba-ku, Sendai, Miyagi, Japan</p> <p>(Development, Design and Manufacturing of Spray Nozzles and Nozzle-related Systems) ②Development, Design and Manufacturing of Industrial Air Conditioning Humidification Systems ③Development, Design and Manufacturing of Cooling Systems ④Development, Design and Manufacturing of Environmental Cooling Systems ⑤Development, Design, Manufacturing, Sales and Construction of Fog Cultivation Systems for Agriculture and Livestock and Production and Sales of Vegetables and Fruits related of Them ⑥After-sale Service to the Above NIHURAKI FACTORY: 177, Horiyoshi, Nishiwaki, Hyogo, Japan</p> <p>(Development, Design and Manufacturing of Spray Nozzles and Nozzle-related Systems) ②Development, Design and Manufacturing of Industrial Air Conditioning Humidification Systems ③Development, Design and Manufacturing of Cooling Systems ④Development, Design and Manufacturing of Environmental Cooling Systems ⑤Development, Design and Manufacturing of Fog Cultivation Systems for Agriculture and Livestock and Production and Sales of Vegetables and Fruits related of Them ⑥After-sale Service to the Above KURE FACTORY: 1-4-1, Sogame, Kure, Hiroshima, Japan</p> <p>(Development, Design, Manufacturing, Sales and Construction of Fog Cultivation Systems for Agriculture and Livestock and Production and Sales of Vegetables and Fruits related of Them) ⑥After-sale Service to the Above SHIBANO FARM: 108, Shikawacho, Nishiwaki, Hyogo, Japan</p> <p align="center">Registration Revised Date : 6 February, 2018</p> <p align="center">3-1-22 Shiba-Koen Minato-ku Tokyo 105-8522, Japan <small>This is valid to be used in conjunction with attached Certificate.</small></p>

Selection of the correct nozzle



For an application to be efficient and silent, it is necessary to select the correct nozzle, to reduce air consumption as much as possible.

1. TYPES OF BLOWING ACCORDING TO THE APPLICATION



In general, a flat blow is applied to uniform objects that do not contain sharp angles, bends or concave / convex surfaces,

For example, in a multitude of processes of blowing and drying of bands and flat surfaces in motion.

Conical blowing is applied in cases where pieces have irregular shapes or recesses. This type of blowing is widespread in the metal industry, in machining processes, expulsion, etc. In these processes it is important to try to blow with a slight degree of

inclination of up to 15° in the opposite direction, in order to provide an elliptical distribution of the stream jet, thus increasing its contact time with the piece and improving the blowing efficiency.

2. BLOWING FORCE



Depending on the type of application, it is important to determine the necessary force for it, as an insufficient force will not produce the necessary results, and an excessive blowing force will waste energy and generate control problems.

3. DIMENSIONING



We must determine the appropriate dimensions in each application, avoiding dead spaces (with the consequent loss of air), as well as overlaps in the areas of blowing that generate turbulence and high noise levels.

In addition, the blowing distance to the object must be correctly calculated, since a greater force and higher speed of compressed air are produced at a smaller distance.

The main characteristics and dimensions are indicated in the product data sheet

4. MATERIAL



The choice of the appropriate material must be carried out mainly following the parameters below:

- Application temperature.
- Possibility of mechanical or chemical aggressions.
- Environments with hygienic requirements.
- Need for absence of metallic elements.

5. CONSUMPTION AND CONNECTION



It is important to provide the nozzle with the suitable power and connection elements: as it is useless to select the correct nozzle and connect it with accessories and reductions that generate a significant pressure drop, limit the flow, or do not have a sufficient air supply tube section.

On the other hand, it is necessary that the quality of the air is sufficient to avoid any risk of obstruction and premature deterioration.

6. AIR PRESSURE



Once the installation is completed, it is advisable to adjust the air pressure until the minimum is reached, in order for the application to perform correctly. This adjustment will provide significant energy savings and decrease noise levels.

A reduction of noise levels of 10 dB is perceived by the ear as a decrease in half of the noise level. (Information from the NIOSH Institute).

JAPANESE IKEUCHI TECHNOLOGY



IKEUCHI designs and manufactures a wide range of nozzles and mounting accessories to provide innovative solutions in the numerous uses of compressed air (air boosters) and low pressure (air blowers) in today's industry.

All IKEUCHI nozzle designs are made based on high efficiency and a reduced noise level.

Investing in IKEUCHI nozzles means investing in safety and efficiency.

IKEUCHI, with its 65-year experience, manufactures nozzles of exclusive design with high quality technological materials, such as S303, S304, S316L, aluminium A5052, ABS, PP, PPS.

This diversity of materials adapts to most of the needs of the industry. In addition, IKEUCHI engineers can provide custom-made solutions to meet customer's specific needs. (See features on p. 56).





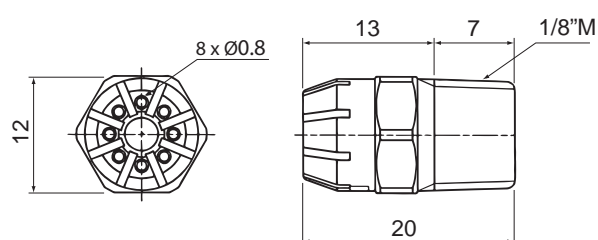
- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a high blowing capacity through its 8 orifices with a free passage diameter of 0.8 mm which generate an effective blow cone.
- Lightweight and compact design.
- Suitable for use with unfiltered air supply where impurities or particles could be observed.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of S316L stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.

Blowing pattern

Round blown



Dimensions (mm)



Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
70	145	220



Material
S316L



Pressure
10 bar



Maximum temperature
400 °C



Thread connection
1/8" male



Weight
7 g



Strength of blowing
2.3 N



Air consumption
220 ℓ/min

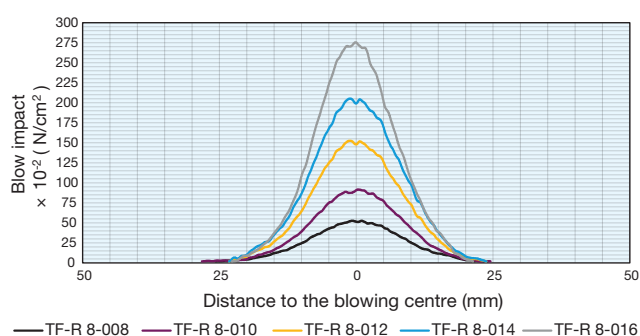


Level of noise
77 dB(A)



Product code
1/8M TF-R 8-008 S316L-IN

TF-R series power (5 bar)



- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a high blowing capacity through its 8 orifices with a free passage diameter of 1 mm which generate an effective blow cone.
- Lightweight and compact design.
- Suitable for use with unfiltered air supply where impurities or particles could be observed.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of S316L stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.



Material
S316L



Pressure
10 bar



Maximum temperature
400 °C



Thread connection
1/8" - 1/4" male



Weight
**7 g (1/8")
12 g (1/4")**



Strength of blowing
3.7 N



Air consumption
360 l/min



Level of noise
83 dB(A)



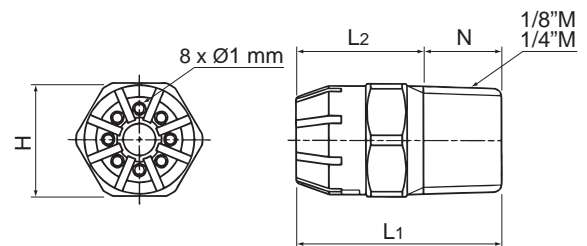
Product code
**1/8M TF-R 8-010 S316L-IN
1/4M TF-R 8-010 S316L-IN**

Blowing pattern

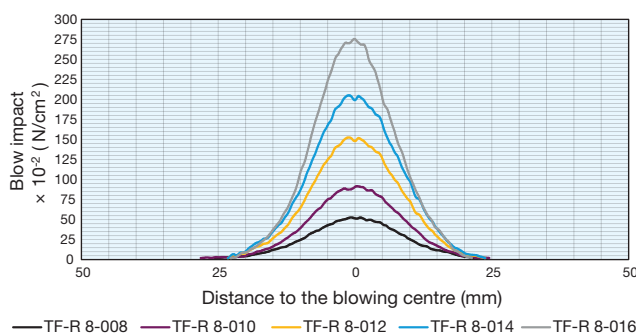
Round blown



Dimensions (mm)



TF-R series power (5 bar)



Connection	Dimensions (mm)				Weight (g)
	L1	L2	H	N	
1/8M	20	13	12	7	7
1/4M	25	15.5	14	9.5	12



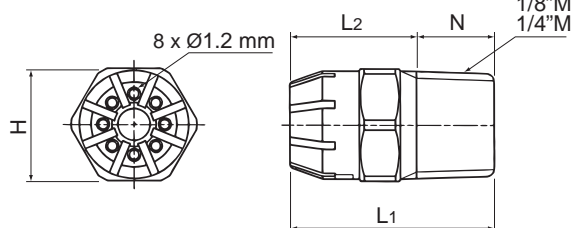
- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a high blowing capacity through its 8 orifices with a free passage diameter of 1.2 mm which generate an effective blow cone.
- Lightweight and compact design.
- Suitable for use with unfiltered air supply where impurities or particles could be observed.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of S316L stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.

Blowing pattern

Round blown



Dimensions (mm)



Connection	Dimensions (mm)				Weight (g)
	L1	L2	H	N	
1/8M	20	13	12	7	7
1/4M	25	15.5	14	9.5	12

Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
180	360	540



Material
S316L



Pressure
10 bar



Maximum temperature
400 °C



Thread connection
1/8" - 1/4" male



Weight
**7 g (1/8")
12 g (1/4")**



Strength of blowing
5.1 N



Air consumption
540 ℓ/min

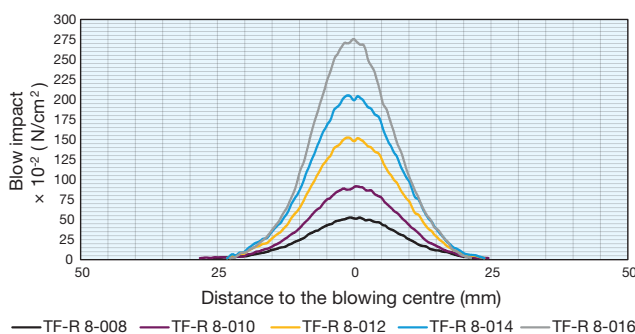


Level of noise
88 dB(A)



Product code
**1/8M TF-R 8-012 S316L-IN
1/4M TF-R 8-012 S316L-IN**

TF-R series power (5 bar)



- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a high blowing capacity through its 8 orifices with a free passage diameter of 1.4 mm which generate an effective blow cone.
- Lightweight and compact design.
- Suitable for use with unfiltered air supply where impurities or particles could be observed.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of S316L stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.



Material
S316L



Pressure
10 bar



Maximum
temperature
400 °C



Thread
connection
1/8" - 1/4"
male



Weight
7 g (1/8")
12 g (1/4")



Strength
of blowing
6.7 N



Air
consumption
720 l/min



Level
of noise
91 dB(A)



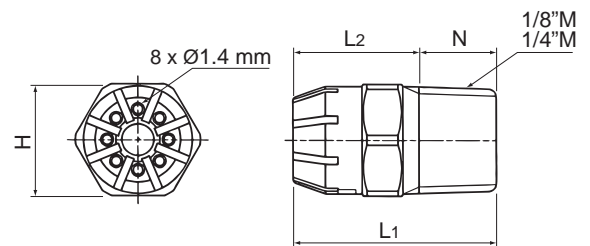
Product code
1/8M TF-R 8-014 S316L-IN
1/4M TF-R 8-014 S316L-IN

Blowing pattern

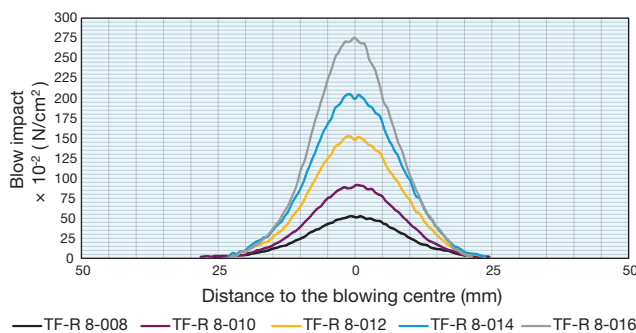
Round blown



Dimensions (mm)



TF-R series power (5 bar)



Connection	Dimensions (mm)				Weight (g)
	L1	L2	H	N	
1/8M	20	13	12	7	7
1/4M	25	15.5	14	9.5	12

Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
240	480	720



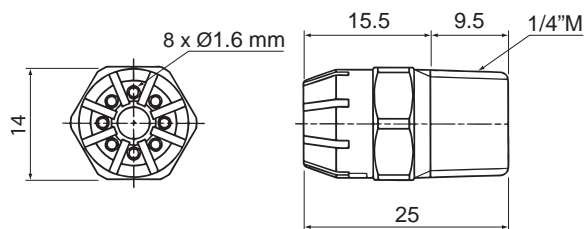
- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a high blowing capacity through its 8 orifices with a free passage diameter of 1.6 mm which generate an effective blow cone.
- Lightweight and compact design.
- Suitable for use with unfiltered air supply where impurities or particles could be observed.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of S316L stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.

Blowing pattern

Round blown



Dimensions (mm)



Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
290	565	870



Material
S316L



Pressure
10 bar



Maximum temperature
400 °C



Thread connection
1/4" male



Weight
12 g



Strength of blowing
10 N



Air consumption
940 ℓ/min

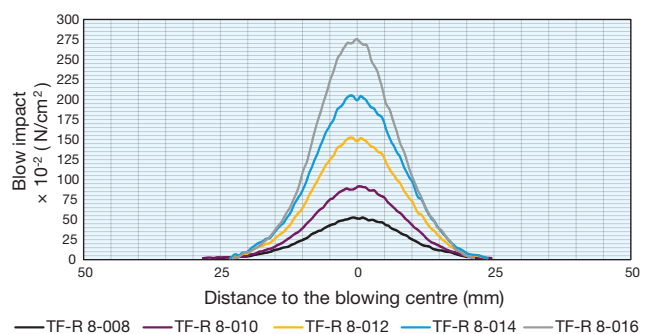


Level of noise
97 dB(A)











Product code
1/4M TF-R 8-016 S316L-IN

TF-R series power (5 bar)



- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a great blowing power through its 36 orifices with a free passage diameter of 1.2 mm which generate an effective blow cone.
- Robust and compact design for use in applications that require high power in tight spaces.
- Suitable for use with unfiltered air supply where impurities or particles could be observed thanks to an optimised interior design.
- Its multi-orifice design prevents clogging.
- Made of S303 stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.



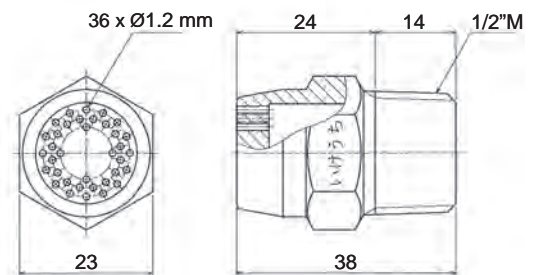
	Material S303		Pressure 10 bar		Maximum temperature 400 °C
	Thread connection 1/2" male		Weight 50 g		Strength of blowing 21 N
	Air consumption 2,220 l/min		Level of noise 98 dB(A)		
	Product code 1/2M TF-R 36-012 S303				

Blowing pattern

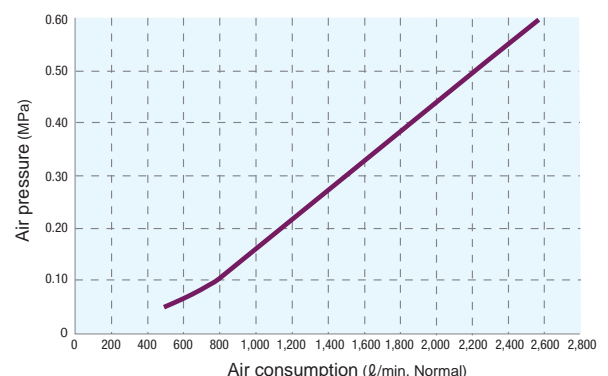
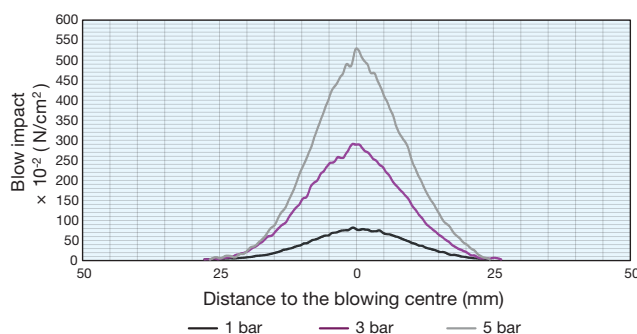
Round blown



Dimensions (mm)

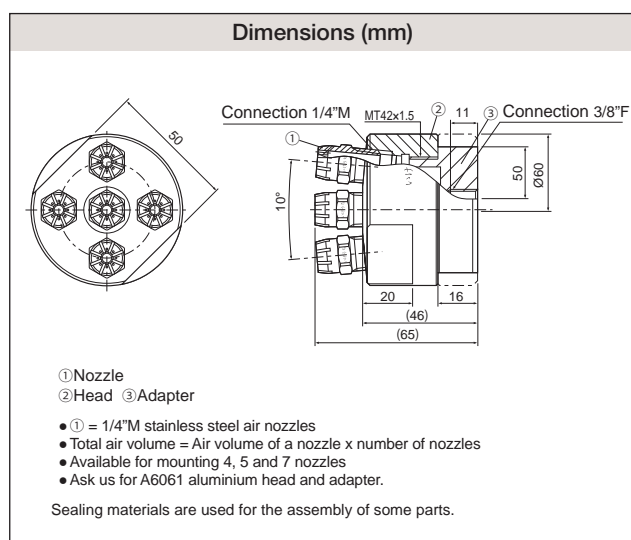


Blow power TF-R 36-012





- Compact adapter head for multi-nozzle assemblies of 4, 5 or 7 nozzles model **TF-R 8-010 / TF-R 8-012 / TF-R 8-014 / TFR 8-016**. By taking full advantage of the space, its ergonomic design allows an effective blow.
- Exclusive design capable of supplying a great blowing power of uniform impact, assuming a great improvement in existing applications.
- Suitable for use with unfiltered air supply where impurities or particles could be observed due to its improved interior design.
- Made of S303 stainless steel, they are highly resistant to both mechanical and chemical aggressions, as well as high temperature.
- Suitable for environments where hygiene is crucial.



Material
S303



Pressure
10 bar



Maximum
temperature
400 °C



Thread
connection
3/8" male



Air
consumption
**Number of nozzles x individual nozzle
consumption ℓ /min**



Product code
3/8M TF-M5R Nozzle Model **S303**
8-010
8-012
8-014
8-016

* Possibility of manufacturing in A6061 aluminium and with 4 or 7 nozzles, for more information contact our sales offices.

Related products

Collector for three TF-M5R



- Air booster nozzle suitable **for the vast majority of applications**. It incorporates a high blowing capacity through its 8 orifices which generate an effective blowing cone.
- Lightweight and compact design. Ideal for use in confined or difficult to reach spaces.
- Suitable for use with unfiltered air supply where impurities or particles could be observed.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Affordable nozzle made of PP that provides great resistance to chemical aggressions and good resistance to high temperature.
- Suitable for environments where hygiene is crucial.

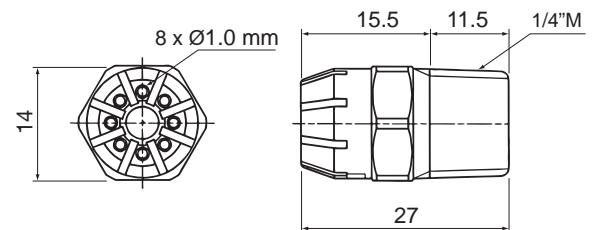











Blowing pattern

Round blown

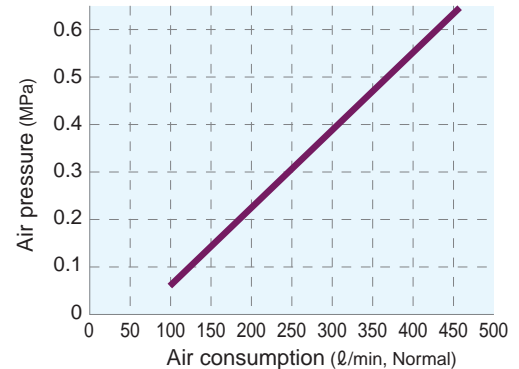
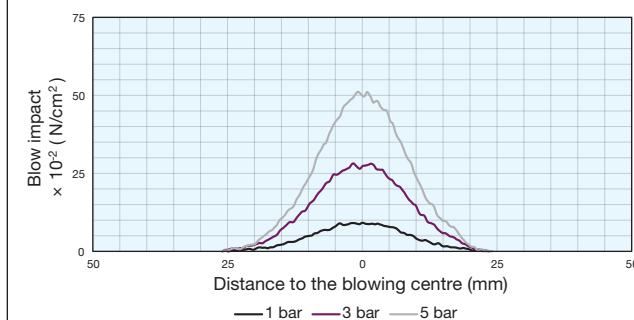


Dimensions (mm)



	Material PP		Pressure 7 bar		Maximum temperature 60 °C
	Thread connection 1/4" male		Weight 2 g		Strength of blowing 3.7 N
	Air consumption 365 l/min		Level of noise 77 dB(A)		
	Product code 1/4M TF-R 8-010 PP-IN				

Blowing power



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
125	245	360



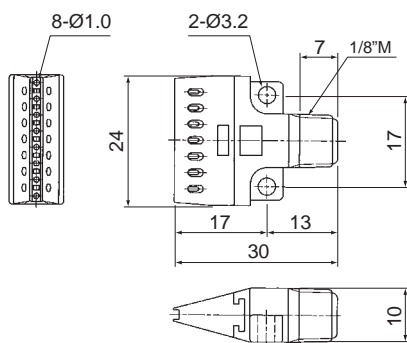
- Air booster nozzle appropriate for applications where flat blowing is required in hard to reach areas or tight spaces. High blowing power through its 8 orifices which generate an effective flat blow.
- Lightweight and ultra-compact design.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Manufactured in PPS by injection, they provide high resistance to chemical aggressions and good resistance to high temperature.
- Suitable for environments where hygiene is crucial.

Blowing pattern

Flat blowing



Dimensions (mm)



Adhesive is necessary for the assembly of some parts.



Material
PPS



Pressure
7 bar



Maximum
temperature
120 °C



Thread
connection
1/8" male



Weight
4 g



Strength
of blowing
3.21 N



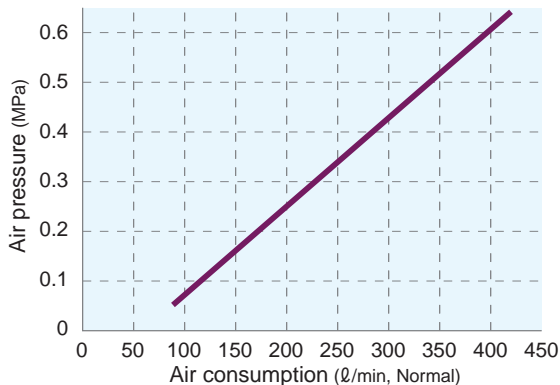
Air
consumption
340 l/min



Level
of noise
82 dB(A)



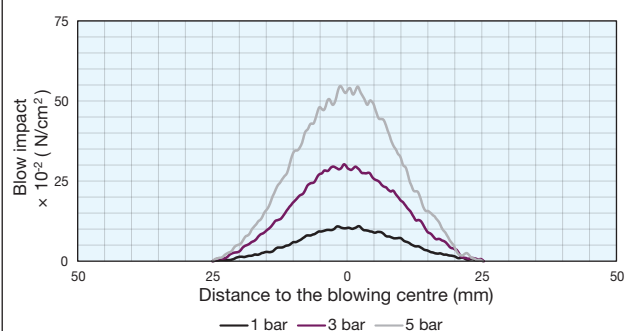
Product code
1/8M TF-F 24-8-010 PPS-IN



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
115	225	340

Blowing power



- Air booster nozzle appropriate for applications where flat blowing is required in hard to reach areas or tight spaces. High blowing power through its 16 orifices which generate an effective flat blow.
- Thanks to its innovative design, it guarantees a considerable reduction in energy consumption by doubling its blowing power.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Lightweight design with a more compact body that makes it ideal for installations with small spaces.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Manufactured in PPS, they have a high resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

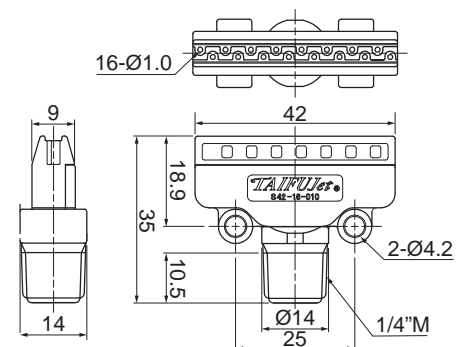


Blowing pattern

Flat blowing



Dimensions (mm)



Material
PPS



Pressure
7 bar



Maximum
temperature
120 °C



Thread
connection
1/4" male



Weight
9 g



Strength
of blowing
6.5 N



Air
consumption
660 l/min

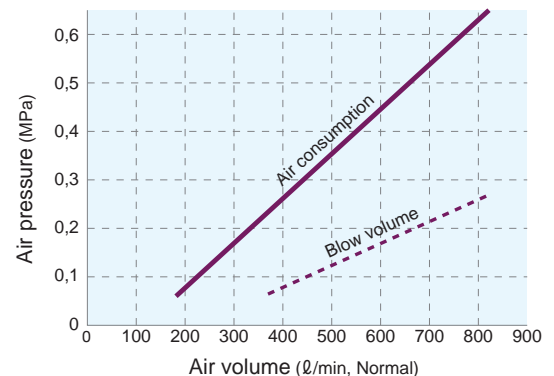
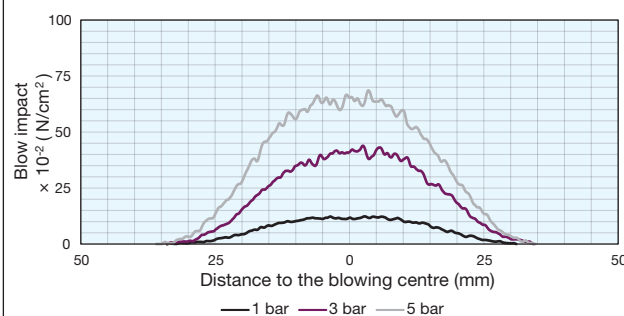


Level
of noise
85 dB(A)



Product code
1/4M TF-FS 42-16-010 PPS

Blowing power



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
215	440	660



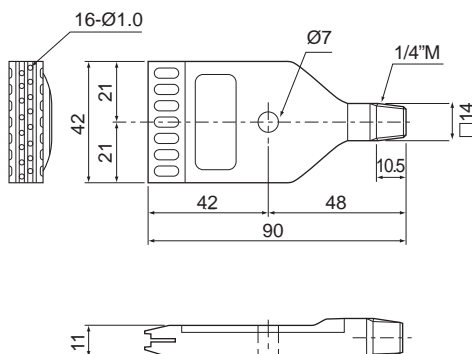
- Air booster nozzle suitable for applications where a flat laminar blow is required. High blowing power through its 16 orifices which generate an effective flat blow.
- It presents a considerable reduction in energy expenditure by doubling its blowing power due to its innovative design.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Lightweight design compared to the stainless-steel model.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Manufactured in PPS that provides great resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

Blowing pattern

Flat blowing



Dimensions (mm)



Material
PPS



Pressure
7 bar



Maximum
temperature
120 °C



Thread
connection
1/4" male



Weight
30 g



Strength
of blowing
5.9 N



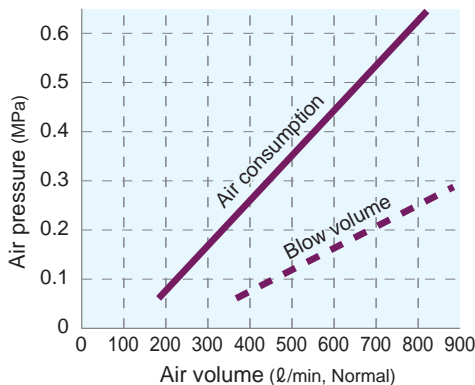
Air
consumption
660 l/min



Level
of noise
85 dB(A)



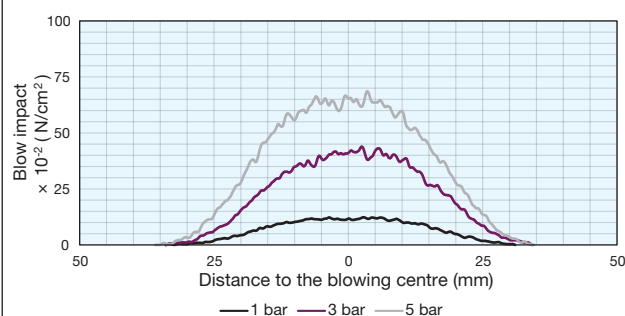
Product code
1/4M TF-F 42-16-010 PPS



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
215	440	660

Blowing power



- Air booster nozzle suitable for applications where a wide laminar blow is required. High blowing power through its 46 orifices which generate an effective flat blow.
- Thanks to its innovative design, it guarantees a considerable reduction in energy consumption by doubling its blowing power.
- Blowing width three times greater than the one of the nozzles TF-F 42 and TF-FS 42.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Manufactured in PPS that provides great resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

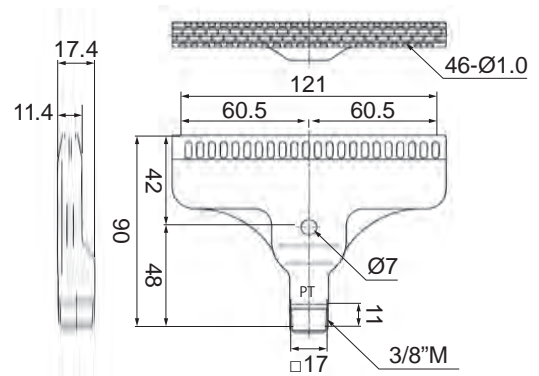


Blowing pattern

Flat blowing



Dimensions (mm)



Material
PPS



Pressure
7 bar



Maximum
temperature
120 °C



Thread
connection
3/8" male



Weight
62 g



Strength
of blowing
17 N



Air
consumption
1,830 l/min

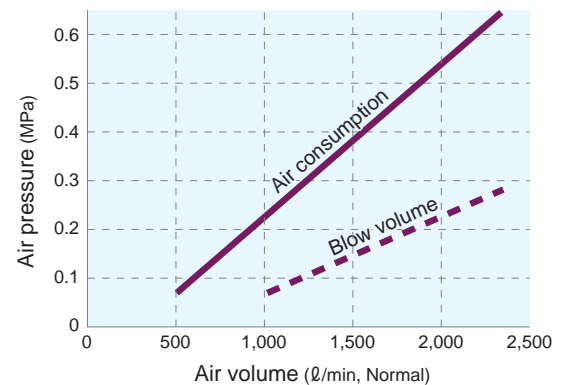
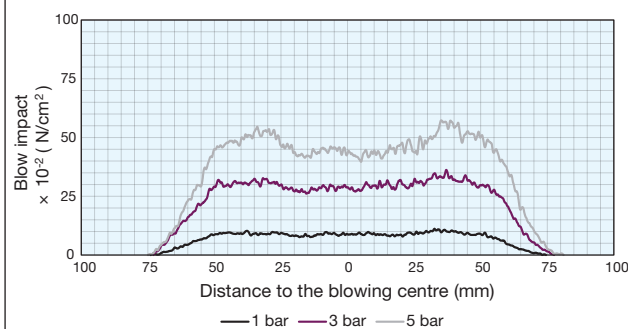


Level
of noise
86 dB(A)



Product code
3/8M TF-F 121-46-010 PPS

Blowing power



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
610	1,220	1,830



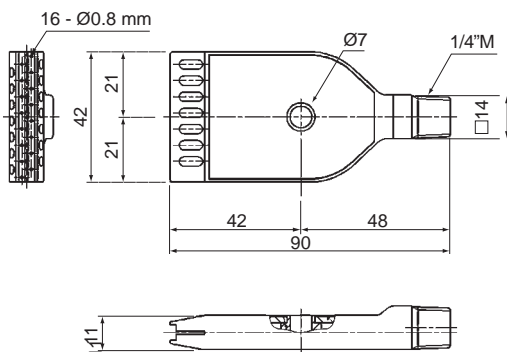
- Air booster nozzle suitable for applications where a flat laminar blow is required. High blowing power through its 16 orifices with a free passage diameter of 0.8 mm, which generate an effective flat blow.
- It presents a considerable reduction in energy expenditure by doubling its blowing power due to its innovative design.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Robust and innovative design.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of injected S316L stainless steel that provides high resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

Blowing pattern

Flat blowing



Dimensions (mm)



Material
S316L



Pressure
10 bar



Maximum
temperature
400 °C



Thread
connection
1/4" male



Weight
144 g



Strength
of blowing
3.68 N



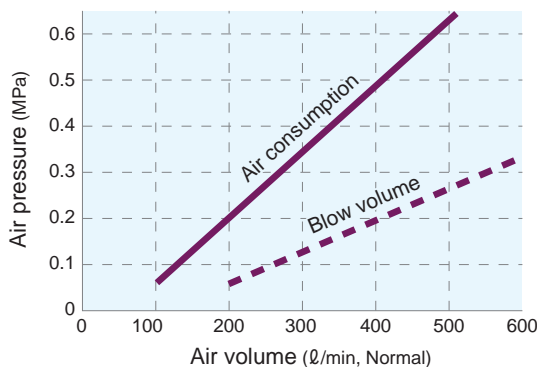
Air
consumption
425 l/min



Level
of noise
79 dB(A)



Product code
1/4M TF-F 42-16-008 S316L-IN



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
140	280	425

- Air booster nozzle suitable for applications where a flat laminar blow is required. High blowing power through its 16 orifices with a free passage diameter of 1 mm, which generate an effective flat blow.
- It presents a considerable reduction in energy expenditure by doubling its blowing power due to its innovative design.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Robust and innovative design.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of injected S316L stainless steel that provides great resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

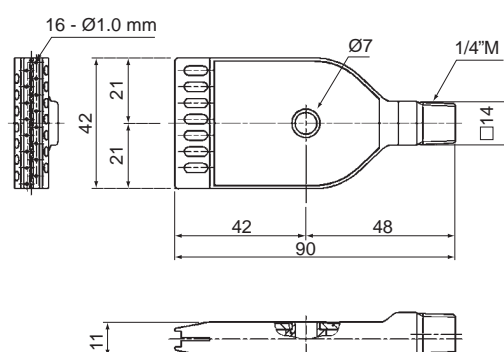











Blowing pattern

Flat blowing

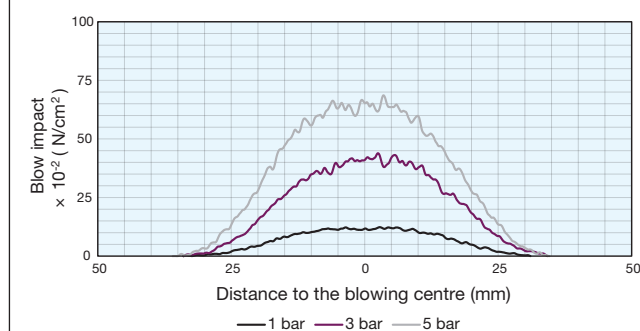


Dimensions (mm)

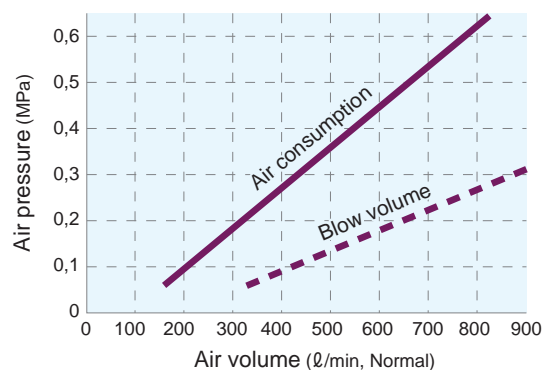


 Material S316L	 Pressure 10 bar	 Maximum temperature 400 °C
 Thread connection 1/4" male	 Weight 144 g	 Strength of blowing 5.9 N
 Air consumption 655 l/min	 Level of noise 84 dB(A)	
 Product code 1/4M TF-F 42-16-010 S316L-IN		

Blowing power



For more information about other models of the TF-F 42 series, contact us.



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
215	435	655



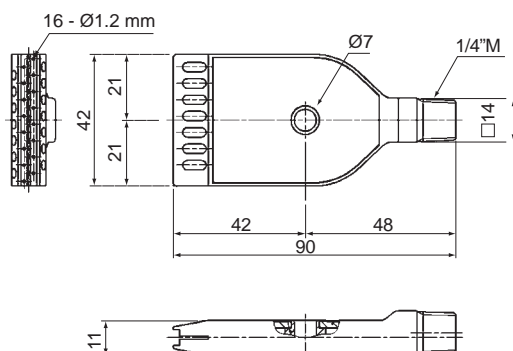
- Air booster nozzle suitable for applications where a flat laminar blow is required. High blowing power through its 16 orifices with a free passage diameter of 1.2, which generate an effective flat blow.
- It presents a considerable reduction in energy expenditure by doubling its blowing power due to its innovative design.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Robust and innovative design.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of injected S316L stainless steel that provides high resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

Blowing pattern

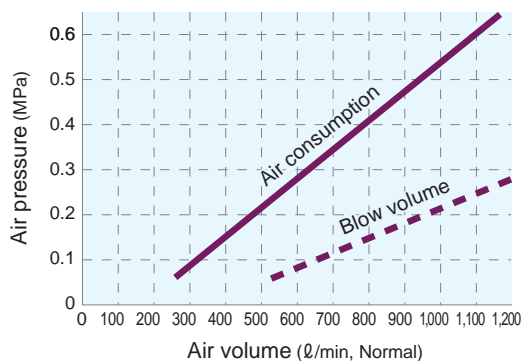
Flat blowing



Dimensions (mm)



Material S316L	Pressure 10 bar	Maximum temperature 400 °C
Thread connection 1/4" male	Weight 144 g	Strength of blowing 8.4 N
Air consumption 925 l/min	Level of noise 86 dB(A)	Product code 1/4M TF-F 42-16-012 S316L-IN



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
300	605	925

- Air booster nozzle suitable for applications where a powerful flat and laminar blow is required. High blowing power through its 16 orifices which generate an effective flat blow for most applications in the industry.
- Thanks to its innovative design, it guarantees a considerable reduction in energy consumption by doubling its blowing power.
- Uniform distribution of the blow in multi-nozzle assemblies thanks to its interior design.
- Blowing width greater than the one of the nozzles TF-F 42 and TF-FS 42.2.
- **In addition to its high effectiveness, it presents a very low noise level. (The human ear interprets a reduction of noise by 10 dB(A) as 50% less noise.)**
- Its multi-orifice design prevents clogging, not exceeding 2.1 bar of static pressure, according to safety regulations.
- Made of stainless steel S304 that provides great resistance to mechanical, chemical and high temperature aggressions.
- Suitable for environments where hygiene is crucial.

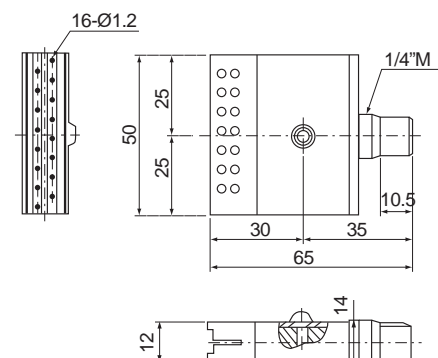











Blowing pattern

Flat blowing

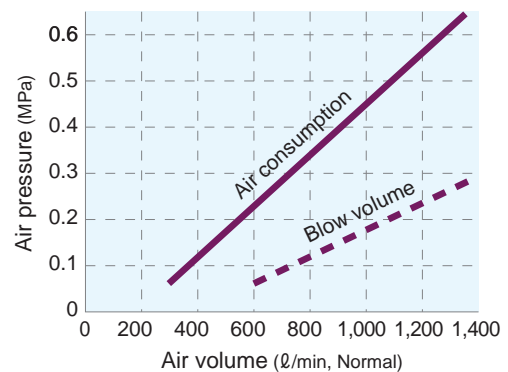
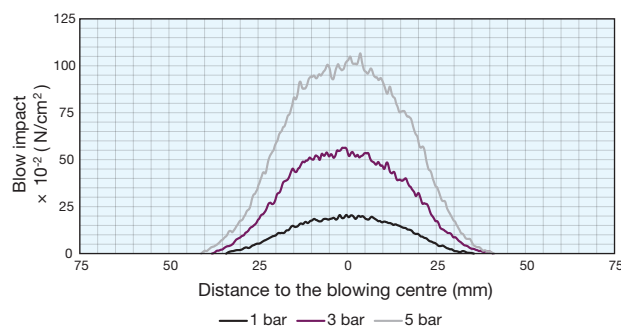


Dimensions (mm)



 Material S304	 Pressure 10 bar	 Maximum temperature 400 °C
 Thread connection 1/4" male	 Weight 140 g	 Strength of blowing 11.5 N
 Air consumption 1,035 l/min	 Level of noise 87 dB(A)	 Product code 1/4M TF-F 50-16-012 S304

Blowing power



Consumption (l/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
345	685	1,035



- Compact air nozzle model HF 7-012 made of stainless steel S303 that shows high resistance to high temperature, abrasion and corrosion.
- The blow outlet design achieves a uniform flat blow.
- Detachable nozzle for better cleaning.
- **Noise level reduction by more than 10 dB compared to a single hole nozzle.**



Material
S303



Pressure
7 bar



Maximum
temperature
400 °C



Thread
connection
1/4" male



Weight
70 g



Strength
of blowing
4.2 N



Air
consumption
425 ℓ/min



Level
of noise
83 dB(A)

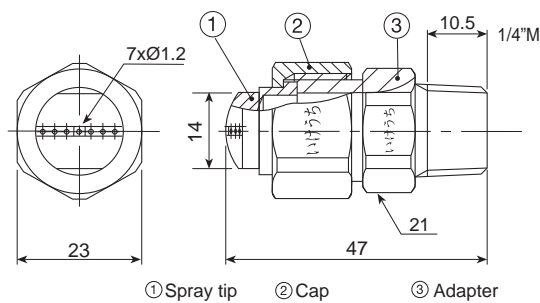


Product code
1/4M HF 7-012 S303

Blowing pattern



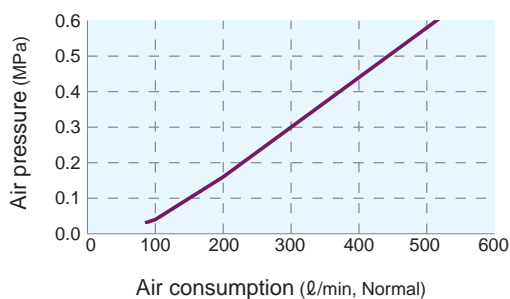
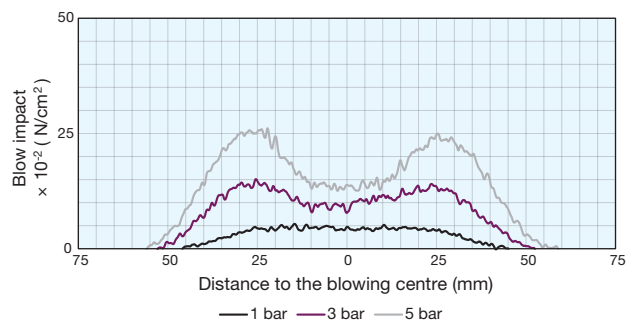
Dimensions (mm)



Spray width and thickness (mm)

Pressure	0.1 MPa		0.3 MPa		0.4 MPa	
Distance	Width	Thickness	Width	Thickness	Width	Thickness
50 mm	60	40	60	60	60	60
150 mm	110	80	120	120	120	120
300 mm	150	120	190	150	200	160










Blowing power



Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
140	280	425

- Compact air nozzle model HF 7-012 made of stainless steel S303 that shows high resistance to high temperature, abrasion and corrosion.
- The blow outlet design achieves a uniform flat blow.
- Detachable nozzle for better cleaning.
- **Noise level reduction by more than 10 dB compared to a single hole nozzle.**

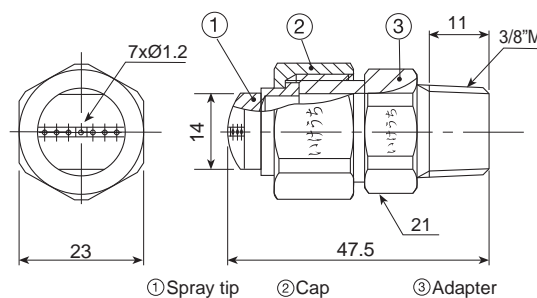
 Material S303	 Pressure 7 bar	 Maximum temperature 400 °C
 Thread connection 3/8" male	 Weight 75 g	 Strength of blowing 4.2 N
 Air consumption 425 ℓ/min	 Level of noise 83 dB(A)	
 Product code 3/8M HF 7-012 S303		



Blowing pattern



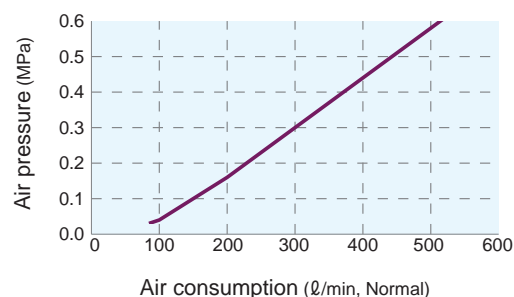
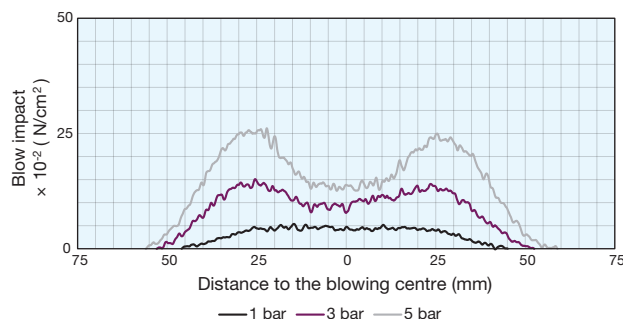
Dimensions (mm)



Spray width and thickness (mm)

Pressure	0.1 MPa		0.3 MPa		0.4 MPa	
Distance	Width	Thickness	Width	Thickness	Width	Thickness
50 mm	60	40	60	60	60	60
150 mm	110	80	120	120	120	120
300 mm	150	120	190	150	200	160

Blowing power



Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
140	280	425



- Compact air nozzle model HF 14-010 manufactured in stainless steel S303 that shows high resistance to high temperature, abrasion and corrosion.
- The blow outlet design achieves a uniform flat blow.
- Detachable nozzle for better cleaning.
- **Noise level reduction by more than 10 dB compared to a single hole nozzle.**



Material
S303



Pressure
7 bar



Maximum temperature
400 °C



Thread connection
1/4" male



Weight
70 g



Strength of blowing
5.7 N



Air consumption
620 ℓ/min



Level of noise
88 dB(A)

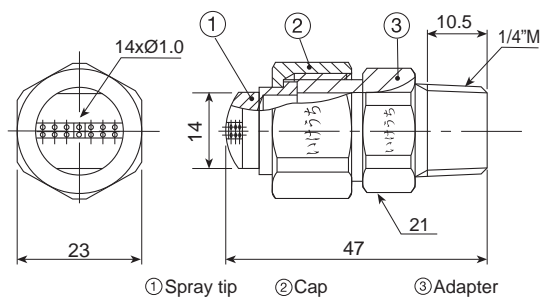


Product code
1/4M HF 14-010 S303

Blowing pattern

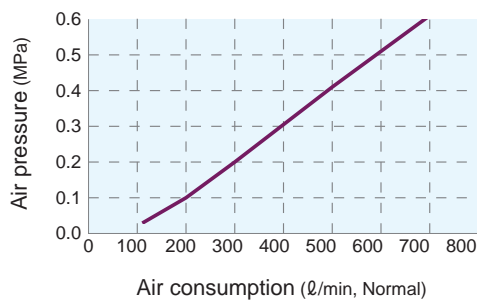


Dimensions (mm)



Spray width and thickness (mm)

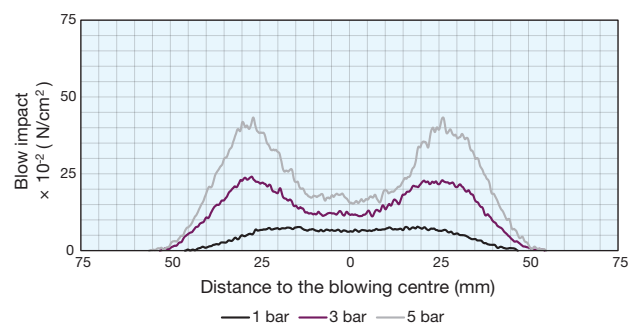
Pressure	0.1 MPa		0.3 MPa		0.4 MPa	
Distance	Width	Thickness	Width	Thickness	Width	Thickness
50 mm	60	40	70	60	80	60
150 mm	120	80	140	120	150	120
300 mm	170	120	200	150	220	160



Consumption (ℓ/min, Normal)










0.1 MPa	0.3 MPa	0.5 MPa
210	420	620

Blowing power

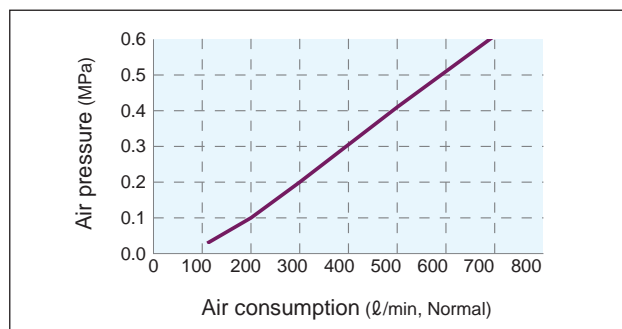
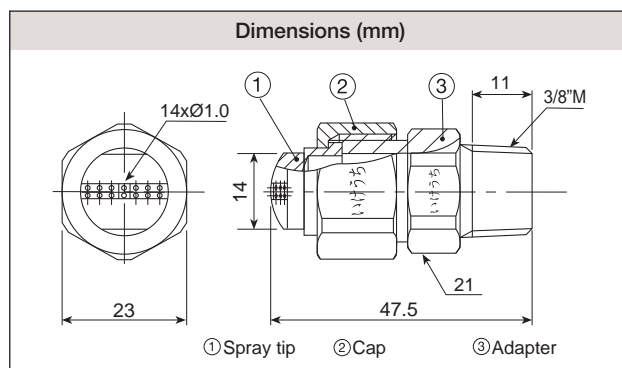
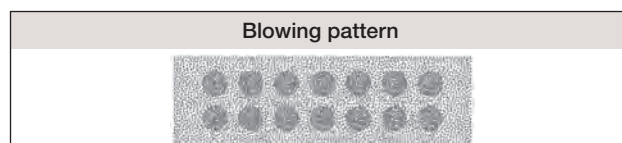
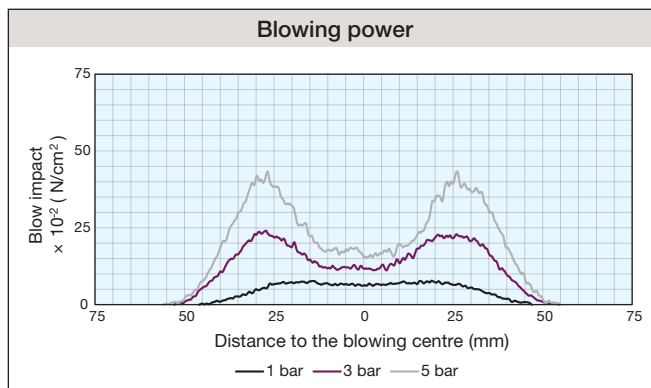


- Compact air nozzle model HF 14-010 manufactured in stainless steel S303 that shows high resistance to high temperature, abrasion and corrosion.
- The blow outlet design achieves a uniform flat blow.
- Detachable nozzle for better cleaning.
- **Noise level reduction by more than 10 dB compared to a single hole nozzle.**



 Material S303	 Pressure 7 bar	 Maximum temperature 400 °C
 Thread connection 3/8" male	 Weight 75 g	 Strength of blowing 5.7 N
 Air consumption 620 ℓ/min	 Level of noise 88 dB(A)	
 Product code 3/8M HF 14-010 S303		

Spray width and thickness (mm)						
Pressure	0.1 MPa		0.3 MPa		0.4 MPa	
Distance	Width	Thickness	Width	Thickness	Width	Thickness
50 mm	60	40	70	60	80	60
150 mm	120	80	140	120	150	120
300 mm	170	120	200	150	220	160



Consumption (ℓ/min, Normal)		
0.1 MPa	0.3 MPa	0.5 MPa
210	420	620



- Compact air nozzle model HF 19-010 manufactured in stainless steel S303 that shows high resistance to high temperature, abrasion and corrosion.
- The blow outlet design achieves a uniform flat blow.
- Detachable nozzle for better cleaning.
- **Noise level reduction by more than 10 dB compared to a single hole nozzle.**



Material
S303



Pressure
7 bar



Maximum
temperature
400 °C



Thread
connection
1/4" male



Weight
70 g



Strength
of blowing
8.6 N



Air
consumption
850 ℓ/min

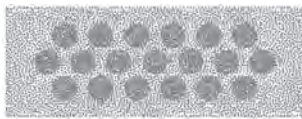


Level
of noise
90 dB(A)

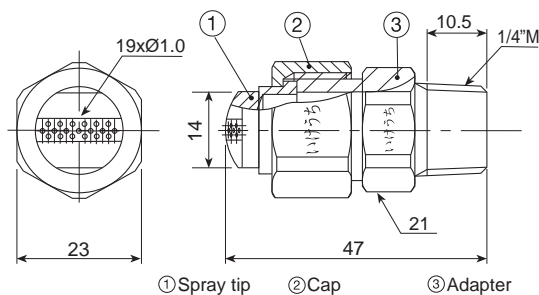


Product code
1/4M HF 19-010 S303

Blowing pattern



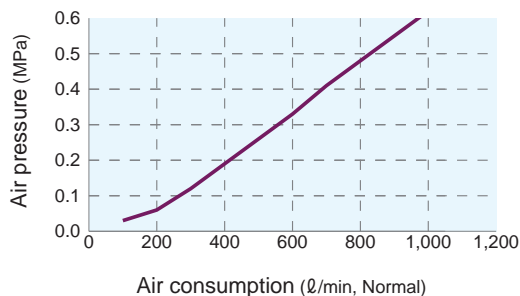
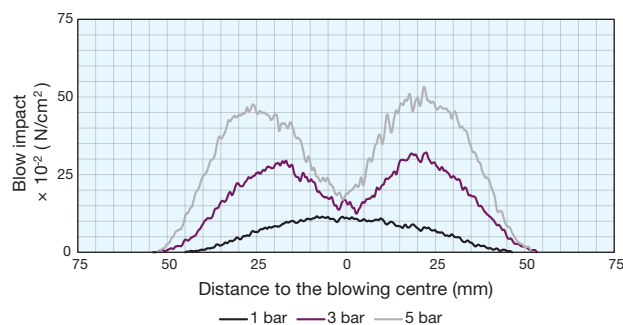
Dimensions (mm)



Spray width and thickness (mm)

Pressure	0.1 MPa		0.3 MPa		0.4 MPa	
Distance	Width	Thickness	Width	Thickness	Width	Thickness
50 mm	60	40	80	60	80	60
150 mm	120	80	140	120	150	120
300 mm	180	120	210	150	230	160

Blowing power



Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
275	560	850

- Compact air nozzle model HF 19-010 manufactured in stainless steel S303 that shows high resistance to high temperature, abrasion and corrosion.
- The blow outlet design achieves a uniform flat blow.
- Detachable nozzle for better cleaning.
- **Noise level reduction by more than 10 dB compared to a single hole nozzle.**



Material
S303



Pressure
7 bar



Maximum temperature
400 °C



Thread connection
3/8" male



Weight
75 g



Strength of blowing
8.6 N



Air consumption
850 ℓ/min



Level of noise
90 dB(A)

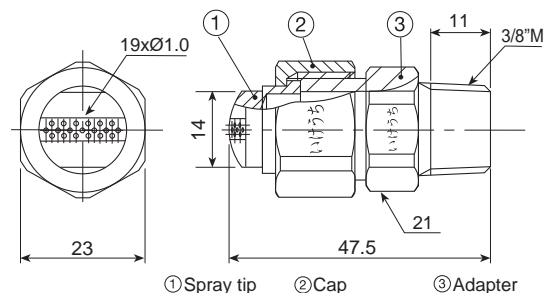


Product code
3/8M HF 19-010 S303

Blowing pattern



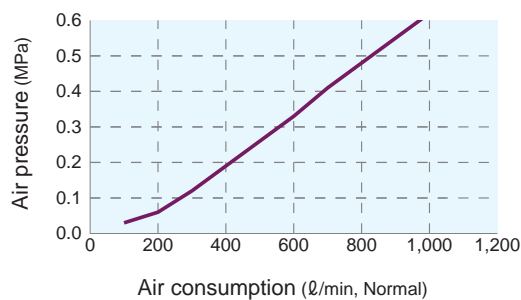
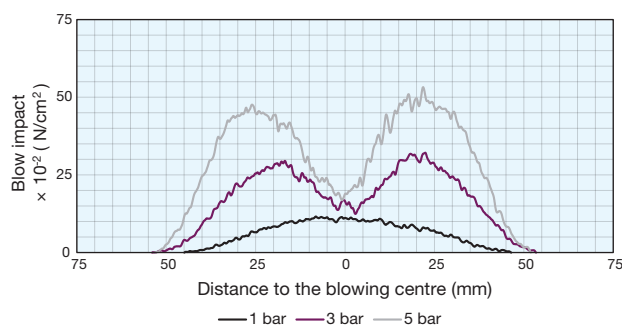
Dimensions (mm)



Spray width and thickness (mm)

Pressure	0.1 MPa		0.3 MPa		0.4 MPa	
Distance	Width	Thickness	Width	Thickness	Width	Thickness
50 mm	60	40	80	60	80	60
150 mm	120	80	140	120	150	120
300 mm	180	120	210	150	230	160

Blowing power



Consumption (ℓ/min, Normal)

0.1 MPa	0.3 MPa	0.5 MPa
275	560	850



- Compact air nozzle model VZ made of stainless steel S303 with high resistance to high temperature, abrasion and corrosion.
- Compact nozzle with a large coverage area thanks to the head design, which achieves a 90° angle spray.
- Detachable nozzle for better cleaning.



Material
S303



Pressure
7 bar



Maximum
temperature
400 °C



Thread
connection
1/4" male



Weight
44 g



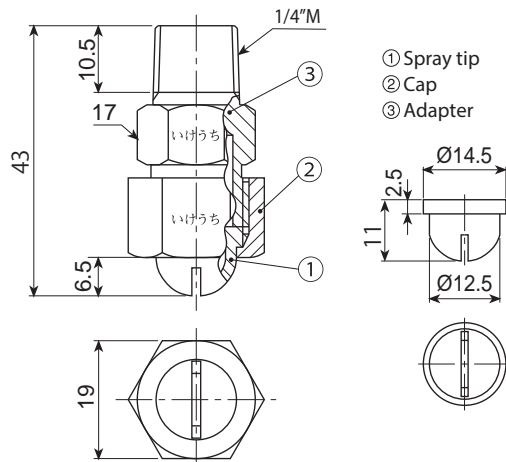
Product code
1/4M VZ 150-500 S303

Blowing pattern

Flat blowing



Dimensions (mm)

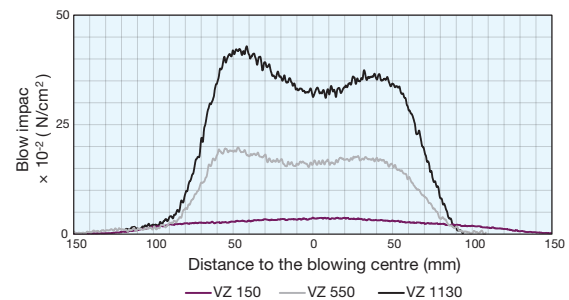


Building:

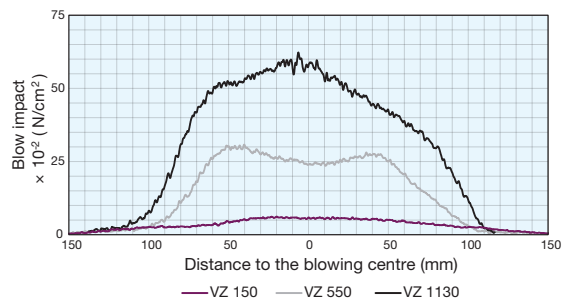
- It is made up of three parts: spray tip, cap and adapter.
- Worn-out spray tip can be replaced separately.
- The cap and the adapter are interchangeable with those of standard flat spray nozzles of three-piece structure (for liquids).

*The appearance and dimensions may vary slightly depending on the materials and codes of the nozzles.

Blowing power (3 bar)









Blowing power (5 bar)



Spray angle	Air Capacity (Code)	Force (N) (5 bar)	Air capacity (ℓ/min. Normal)						Steam capacity (kg/h)						Free passage diameter (Ø mm)	dB(A)
			0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa		
90	150	1.2	55.7	77.6	116	154	230	307	2.62	3.56	5.27	6.97	10.3	13.7	0.2	70
	200	2.2	73.1	102	152	202	302	402	3.44	4.67	6.92	9.14	13.6	17.9	0.3	72
	250	3.1	90.5	126	188	250	374	498	4.26	5.78	8.57	11.3	16.8	22.2	0.4	74
	300	4.1	108	150	224	298	446	594	5.08	6.90	10.2	13.5	20.0	26.5	0.5	75
	350	5.0	125	175	261	346	518	690	5.90	8.00	11.9	15.7	23.2	30.7	0.6	77
	400	6.0	143	199	297	394	590	786	6.72	9.12	13.5	17.9	26.5	35.0	0.7	79
	450	7.0	160	223	333	443	662	882	7.54	10.2	15.2	20.0	29.7	39.3	0.8	81
	500	7.9	177	247	369	491	734	977	8.36	11.3	16.8	22.2	32.9	43.5	0.9	82

*Standard data at 3 bar.

- Compact air nozzle model VZ made of stainless steel S303 with high resistance to high temperature, abrasion and corrosion.
- Compact nozzle with a large coverage area thanks to the head design, which achieves a 90° angle spray.
- Detachable nozzle for better cleaning.

	Material S303		Pressure 7 bar		Maximum temperature 400 °C
	Thread connection 3/8" male		Weight 73 g		Product code 3/8M VZ 550-1130 S303

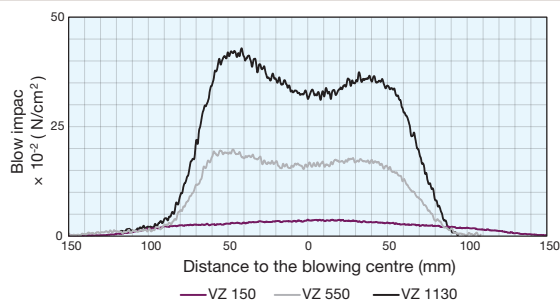


Blowing pattern

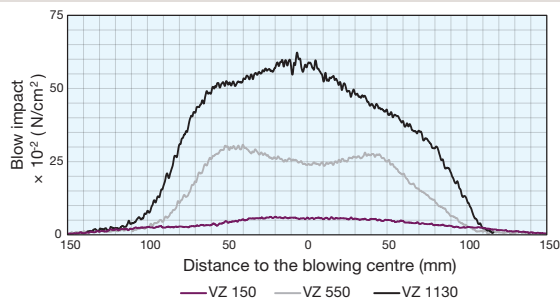
Flat blowing



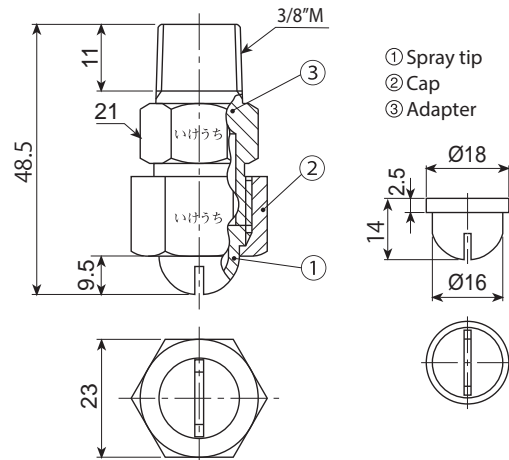
Blowing power (3 bar)



Blowing power (5 bar)



Dimensions (mm)



Building:

- It is made up of three parts: spray tip, cap and adapter.
- Worn-out spray tip can be replaced separately.
- The cap and the adapter are interchangeable with those of standard flat spray nozzles of three-piece structure (for liquids).

*The appearance and dimensions may vary slightly depending on the materials

Spray angle	Air Capacity (Code)	Force (N) (5 bar)	Air capacity (ℓ/min. Normal)						Steam capacity (kg/h)						Free passage diameter (Ø mm)	dB(A)
			0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa		
90	550	8.9	199	278	414	551	823	1.096	9.38	12.7	18.8	24.9	36.9	48.8	0.6	84
	600	9.8	219	305	455	605	905	1.205	10.3	14.0	20.7	27.4	40.6	53.7	0.7	86
	650	10.8	235	328	489	650	972	1.295	11.1	15.0	22.3	29.4	43.6	57.7	0.8	87
	700	11.8	253	353	526	700	1.047	1.394	11.9	16.2	24.0	31.7	46.9	62.1	0.8	89
	750	12.7	272	380	566	753	1.126	1.500	12.8	17.4	25.8	34.1	50.5	66.8	0.9	90
	900	13.7	326	454	677	901	1.347	1.794	15.3	20.8	30.8	40.7	60.4	79.9	1.1	92
	1130	14.6	406	566	844	1.122	1.678	2.235	19.1	25.9	38.4	50.8	75.2	99.5	1.4	94

*Standard data at 3 bar.



- Air nozzle made of stainless steel S303 with high resistance to temperature, abrasion and corrosion.
- 4 models available with different blowing powers.
- Designed for precision blowing, it achieves a solid stream jet blow by concentrating all the power at one point.
- Designed for accuracy in hard to reach areas.



Material
S303



Pressure
10 bar



Maximum
temperature
400 °C



Thread
connection
1/8" male



Weight
7.2 g



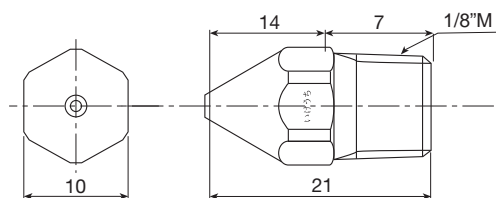
Product code
1/8M CCP 1.0A S303
1/8M CCP 1.5A S303
1/8M CCP 2.0A S303
1/8M CCP 2.5A S303

Blowing pattern

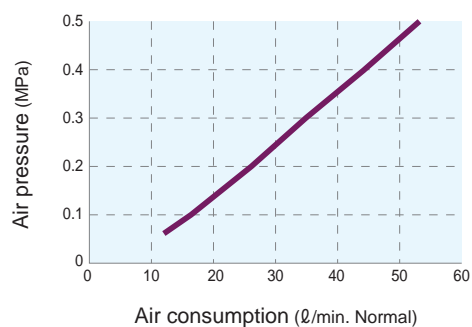
Solid stream jet blow



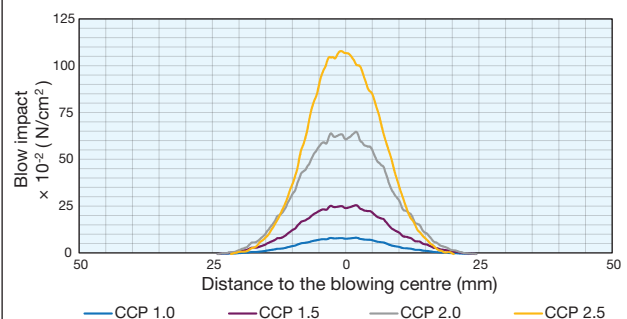
Dimensions (mm)



Orifice diameter Ø 1.0 mm



Blowing power (5 bar)



Ø Orifice diameter (Code)	Force (N) (5 bar)	Air consumption (l / min. Normal)					Orifice diameter (mm)	dB (A)
		0.1 MPa	0.2 MPa	0.3 MPa	0.4 MPa	0.5 MPa		
Ø1.0A	0.5	17	26	35	44	53	1.0	71
Ø1.5A	1.1	40	60	80	100	120	1.5	77
Ø2.0A	2.0	70	104	138	172	206	2.0	83
Ø2.5A	3.1	109	162	215	268	321	2.5	89

*Standard data at 5 bar.

- Air nozzle made of stainless steel S303 with high resistance to temperature, abrasion and corrosion.
- 4 models available with different blowing powers.
- Designed for precision blowing, it achieves a solid stream jet blow by concentrating all the power at one point.
- Designed for accuracy in areas of difficult access.



Material
S303



Pressure
10 bar



Maximum
temperature
400 °C



Thread
connection
1/4" male



Weight
19 g



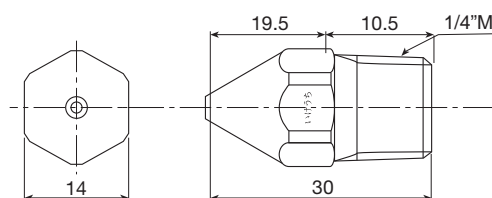
Product code
1/4M CCP 1.0A S303
1/4M CCP 1.5A S303
1/4M CCP 2.0A S303
1/4M CCP 2.5A S303

Blowing pattern

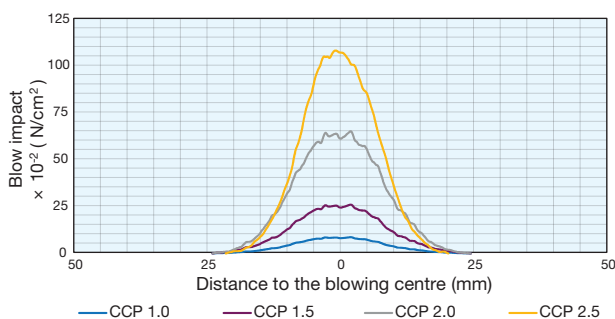
Solid stream jet blow



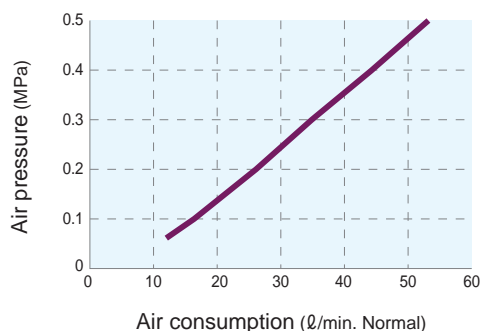
Dimensions (mm)



Blowing power (5 bar)



Orifice diameter Ø 1.0 mm

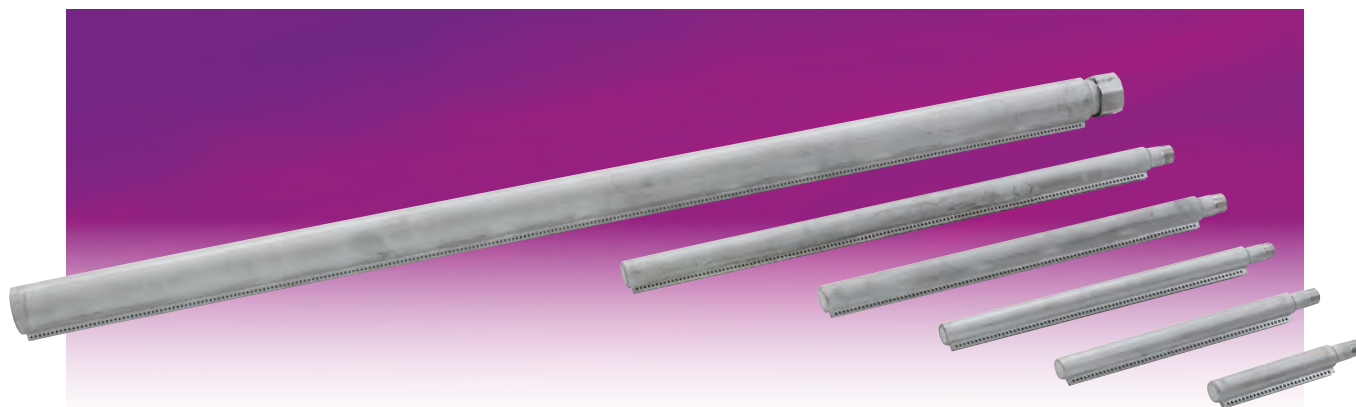


Ø Orifice diameter (Code)	Force (N) (5 bar)	Air consumption (l /min. Normal)					Orifice diameter (mm)	dB (A)
		0.1 MPa	0.2 MPa	0.3 MPa	0.4 MPa	0.5 MPa		
Ø1.0A	0.5	17	26	35	44	53	1.0	71
Ø1.5A	1.1	40	60	80	100	120	1.5	77
Ø2.0A	2.0	70	104	138	172	206	2.0	83
Ø2.5A	3.1	109	162	215	268	321	2.5	89

*Standard data at 5 bar.



"The Fog Engineers"
IKEUCHI EUROPE B.V.



- Long flat air booster made of S304 stainless steel, with an innovative interior design for a homogeneous distribution of the blowing force along its entire blowing length.
- Suitable for use in applications where space is reduced due to absence of threaded nozzles.
- Available in 13 different sizes covering a blow range from 100 to 1,400 mm in length. You can incorporate a single entry or two entries, one at each end, in lengths greater than 500 mm.
- Unique blow design that achieves total coverage of the area to be blown, increasing the efficiency of the operation.
- Manufactured in materials with high resistance to mechanical, chemical and high temperature aggressions.



Material
S304



Pressure
10 bar



Maximum
temperature
400 °C



Thread
connection
1/2" - 1 1/2" male



Air
consumption
**TP-PF 150
2,415 l/min**



Level
of noise
**TP-PF 150
90 dB(A)**



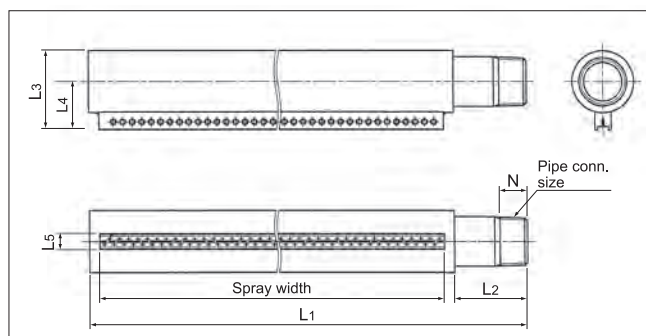
Product code
Connection Model **TF-PF** connector **S304**

Blowing pattern

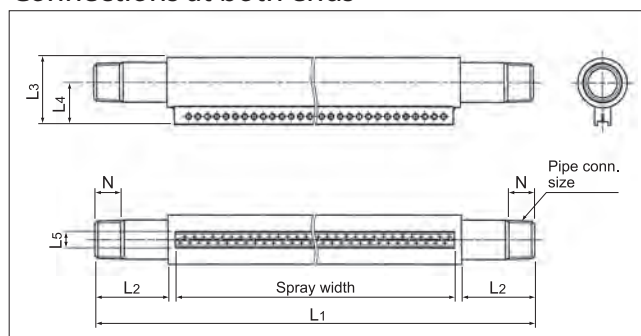
Flat blowing



Connection at one end



Connections at both ends

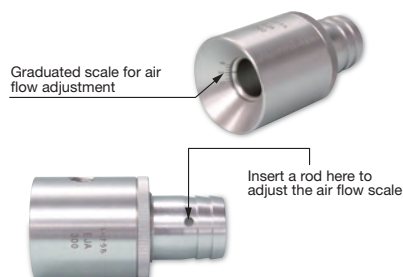
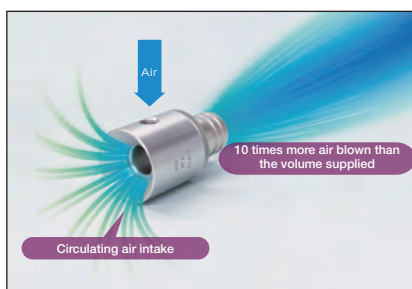


Product code	Pipe conn. size	Dimensions (mm)						Mass (g)
		L1	L2	L3	L4	L5	N	
100- 40-010	1/2M	156	40	37	23	9	14	360
150- 58-010		203	40	37	23	9	14	500
200- 78-010		254	40	37	23	9	14	640
300-118-010		357	40	37	23	9	14	850
400-156-010		455	40	37	23	9	14	1,100
500-196-010	3/4M	557	40	44	27	9	15	2,000
600-234-010		655	40	44	27	9	15	2,400
700-274-010		758	40	44	27	9	15	2,800
800-312-010	1M	856	40	52	31	9	18	3,200
900-352-010		959	40	52	31	9	18	5,100
1000-390-010		1,056	40	52	31	9	18	5,600
1200-468-010		1,257	40	52	31	9	18	6,700
1400-546-010	1 1/2M	1.457	40	70	40	9	20	13,800

Product code	Pipe conn. size*	Dimensions (mm)						Mass (g)
		L ₁	L ₂	L ₃	L ₄	L ₅	N	
500-196-010	2-1/2M	597	40	37	23	9	14	1,750
600-234-010		695	40	37	23	9	14	2,050
700-274-010		798	40	37	23	9	14	2,400
800-312-010	2-3/4M	896	40	44	27	9	15	3,250
900-352-010		999	40	44	27	9	15	3,650
1000-390-010		1,096	40	44	27	9	15	4,000
1200-468-010	2-1M	1,297	40	44	27	9	15	4,750
1400-546-010		1,497	40	52	31	9	18	8,800

*For both-end connection type, pipe connection size is indicated as "the number of inlets"- "thread size".

- The air booster nozzle, thanks to their unique design, amplify the air outlet flow by 10 times, resulting in a very low compressed air consumption.
- Built-in flow adjustment valve for precise adjustment of air output flow and input consumption.
- Large flow through the orifice.



Material
S303



Pressure
6 bar



Maximum temperature
90 °C



Product code
1/8F EJA 150 S303
1/4F EJA 300 S303
3/8F EJA 450 S303
3/8F EJA 750 S303



Thread connection
1/8"-1/4"-3/8" female

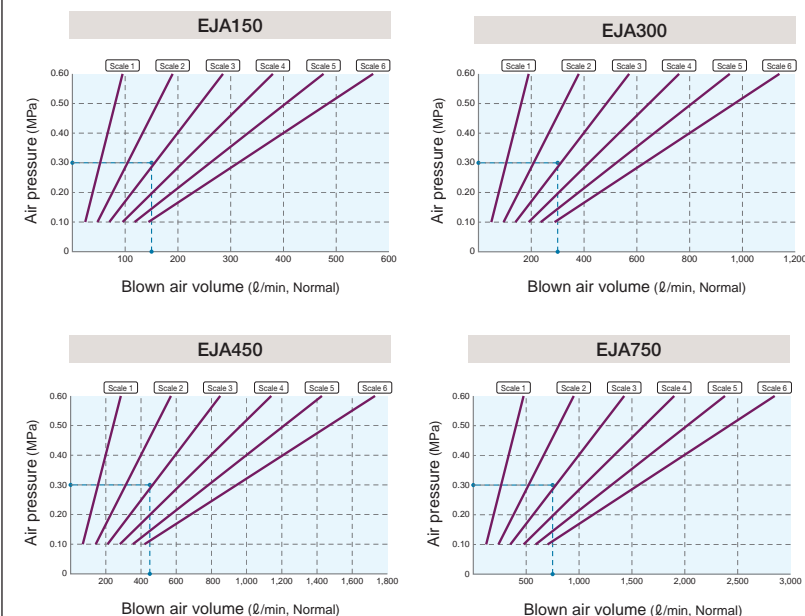


Weight
405 - 2,370 g

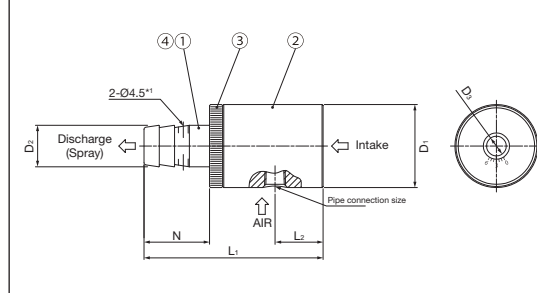


Air consumption
1,720 - 22,500 l/min

Volume of air blown



Dimensions (mm)



Pipe connection size	External dimensions (mm)					Mass (g)
	L1	L2	ØD1	ØD2	ØD3	
1/8F	82	22	38	19	9	405
1/4F	91	24	50.8	32	20	700
3/8F (450)	101	27	76.3	50.8	40	1,520
3/8F (750)	104	29	101.6	76.3	62	2,370

Figures with () indicate the air capacity codes.

Component	Material
① Body	S303
② Adapter	S303
③ Lock nut	S303
④ Board	NBR

*1) Unlocking hole with adjustment rod.

Code	Pipe connection size	Air consumption (l/min, Normal)*2				
		0.1 MPa	0.2 MPa	0.3 MPa	0.4 MPa	0.5 MPa
150	1/8F	71	109	150	193	238
300	1/4F	142	219	300	386	476
450	3/8F	212	328	450	579	714
750	3/8F	354	546	750	965	1,190

*2) Measured with the air flow adjustment scale set to "3".



- Very compact air nozzle, model made of stainless steel S304 with great resistance to temperature, abrasion and corrosion.
- Designed for a minimum pressure loss that improves impact and reduces consumption.
- Large blow coverage area compared to standard nozzle thanks to the head design.
- Suitable for tight spaces.



Material
S304



Pressure
1 bar



Maximum temperature
400 °C



Thread connection
1/8"-1/4" male



Weight
10 - 16 g



Strength of blowing
1.9 - 2.3 N (0.5 bar)



Air consumption
275-365 l/min (0.5 bar)

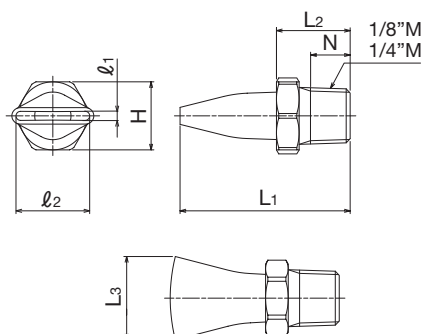


Level of noise
78-79 dB(A) (0.5 bar)



Product code
**1/8M SAP 13-15 S304
1/4M SAP 17-15 S304**

Dimensions

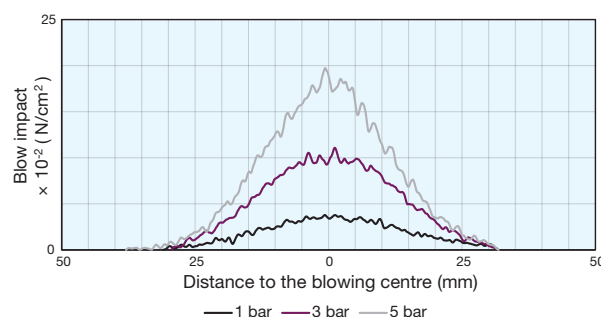


Pipe conn. size	Dimensions (mm)							Mass (g)
	L1	L2	L3	L4	L5	H	N	
1/8M	29	13	14.7	1.5	13	12	7	10
1/4M	37	17.5	18.9	1.5	17	14	10.5	16

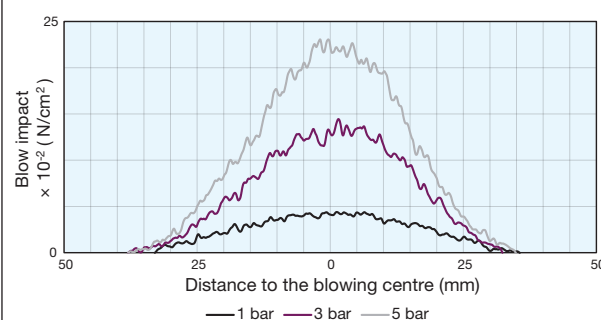
Pipe conn. size	Air consumption (l/min, Normal)				
	10 kPa	20 kPa	30 kPa	40 kPa	50 kPa
1/8M	120	170	208	239	266
1/4M	167	235	287	330	368

Air compressor can be used.
(The table above shows the air consumption)

SAP 13-15 Blowing power












SAP 17-15 Blowing power












- Nozzle for low pressure round blow pattern.
- Made of ABS and aluminium A5052 to achieve a light weight and high strength.
- Able to reduce the energy cost to one-third compared to the consumption of compressed air nozzles.
- Unique design that provides a higher flow rate compared to the flow rate supplied.
- The TF-BR model achieves very low noise levels.

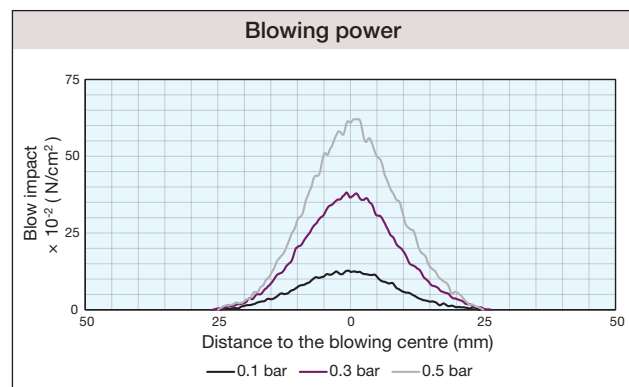
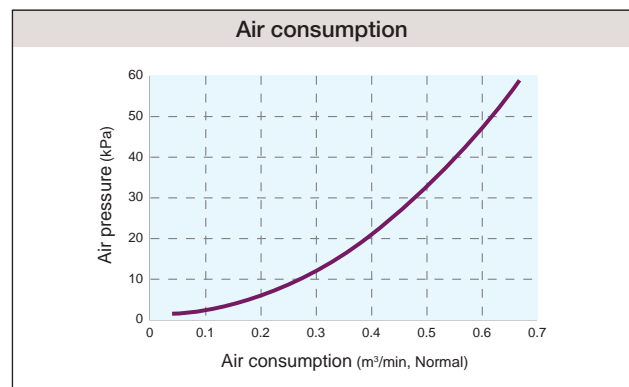
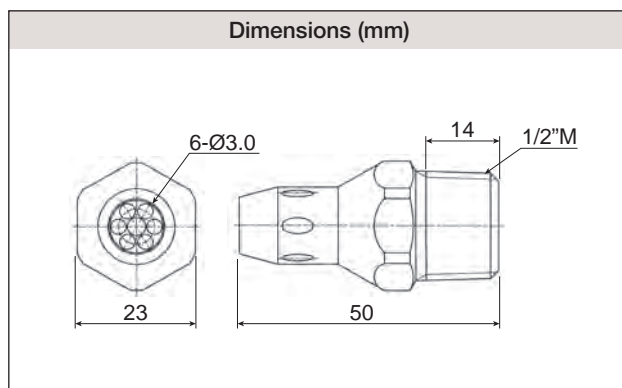
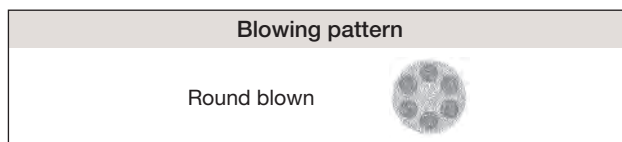


 Material ABS	 Pressure 1 bar	 Maximum temperature 80 °C
 Thread connection 1/2" male	 Weight 8 g	 Strength of blowing 0.5 N
 Air consumption 630 l/min	 Level of noise 88 dB(A)	 Product code 1/2M TF-BR 6-030 ABS

*Calculated at standard pressure 0.5 bar.










 Material A5052	 Pressure 1 bar	 Maximum temperature 400 °C
 Thread connection 1/2" male	 Weight 20 g	 Strength of blowing 0.5 N
 Air consumption 630 l/min	 Level of noise 88 dB(A)	 Product code 1/2M TF-BR 6-030 A5052

*Calculated at standard pressure 0.5 bar.












- Nozzle for low pressure flat blow pattern.
- Made of ABS and aluminium A5052 to achieve a light weight and high strength.
- Able to reduce the energy cost to one-third compared to the consumption of compressed air nozzles.
- Unique design that provides a higher flow rate compared to the flow rate supplied.
- The TF-BF model achieves very low noise levels.



 Material ABS	 Pressure 1 bar	 Maximum temperature 80 °C
 Thread connection 1/2" male	 Weight 26 g	 Strength of blowing 0.6 N
 Air consumption 730 l/min	 Level of noise 86 dB(A)	 Product code 1/2M TF-BF 42-8-030 ABS

*Calculated at standard pressure 0.5 bar.

 Material A5052	 Pressure 1 bar	 Maximum temperature 316 °C
 Thread connection 1/2" male	 Weight 65 g	 Strength of blowing 0.6 N
 Air consumption 730 l/min	 Level of noise 86 dB(A)	 Product code 1/2M TF-BF 42-8-030 A5052

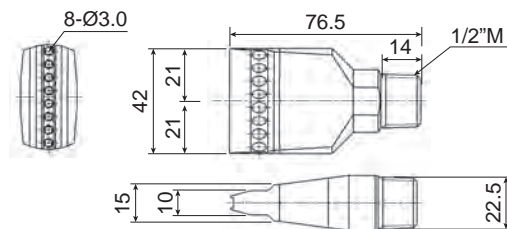
*Calculated at standard pressure 0.5 bar.

Blowing pattern

Flat blowing

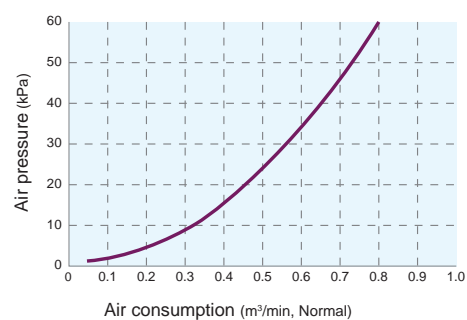


Dimensions (mm)

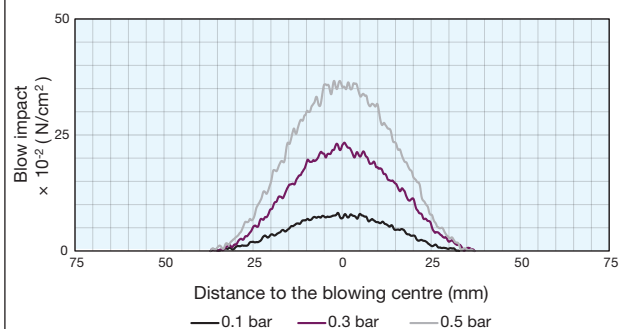


Adhesive is used for assembly of some parts.

Air consumption



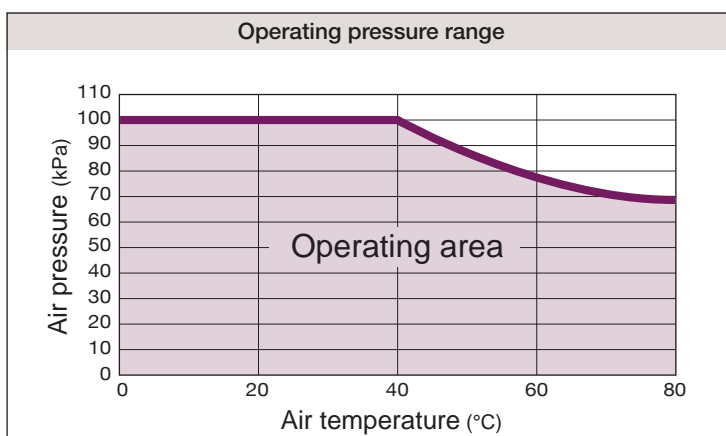
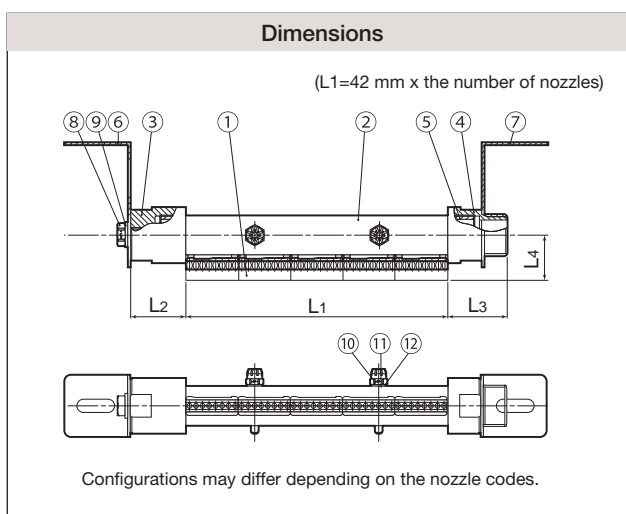
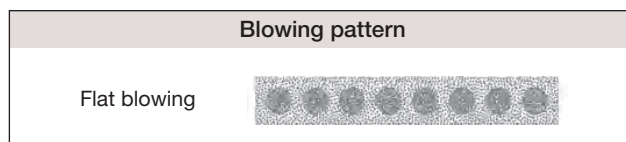
Blowing power





- Blowing manifold for low pressure blowing, made of HTPVC high strength material with PPS nozzle tip, which provides a light weight and a compact design.
- Suitable for use in applications where space is reduced.
- Customisable blow coverage measures in multiples of 42 mm to a length of 1,596 mm which saves operating costs.
- Unique design of the blow head to achieve a large coverage area increasing efficiency.

	Material PPS (nozzle tip) HTPVC (pipe head)		Pressure 1 bar		Maximum temperature 80 °C
	Weight 180 - 3,900 g		Thread connection 1" - 2½" male		Air consumption 1,720 - 22,500 l/min
	Air consumption standard model 3.8 - 20 m³/min (0.5 bar)		Blow hole size 3.0 mm		
	Product code 1M TF-BPF 210-40-030 PPS+HTPVC (210 mm) 1*1/2M TF-BPF 420-80-030 PPS+HTPVC (420 mm) 2M TF-BPF 630-120-030 PPS+HTPVC (630 mm) 2*1/2M TF-BPF 1008-192-030 PPS+HTPVC (1.008 mm)				



Pipe conn.size	No. of nozzle tips	Dimensions (mm)				Mass (g)	
		L1	L2	L3	L4	TAIFUJet	Plate
1M	2 - 5	84 - 210	45	48	36	180 - 270	200
1½M	6 - 13	252 - 546	56	66	44	530 - 840	500
2M	14 - 22	588 - 924	66	73	50	1,350 - 1,830	500
2½M	23 - 38	966 - 1,596	74	84	58	2,940 - 3,900	500

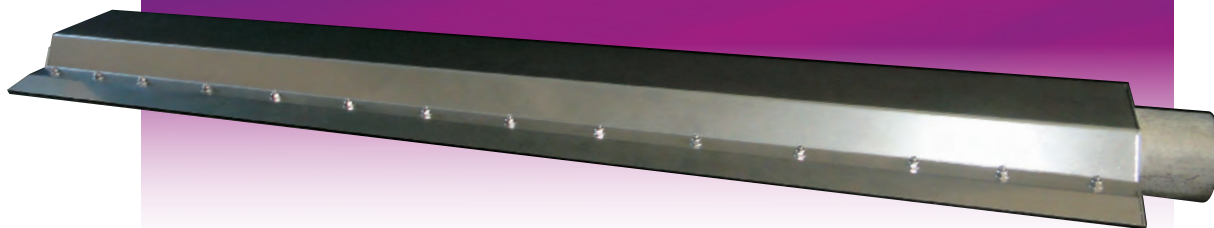
No.	Component	Material	Note
①	Nozzle tip	PPS	
②	Pipe	HTPVC	
③	Cap	HTPVC	PPS for 2½"
④	Adapter	HTPVC	PPS for 2½"
⑤	Sleeve	HTPVC	
⑥	Plate (Fixed)	S304	Optional
⑦	Plate (Loose)	S304	Optional
⑧	Bolt (M10)	S304	Optional
⑨	Washer (10)	S304	Optional
⑩	Bolt (M6)	S304	
⑪	Packaging	PTFE	
⑫	Washer(6)	S304	

Sealing materials are used for the assembly of some parts.

AVAILABLE IN ALUMINIUM



For more information contact one of our sales offices.



- Blow manifold suitable for low pressure blow.
- Made of stainless steel S304 for high resistance.
- Interior design optimised for minimum pressure loss and maximum blowing power.
- Compact design with a fine blowing profile ideal for installation between rollers or tight spaces.
- Customisable blow coverage measures from 400 mm to 1,200 mm and slit openings of 0.5 mm or 1 mm.
- Higher energy savings compared to usual blow manifolds.



Material
S304



Pressure
1 bar



Maximum
temperature
400 °C



Weight
**1,900 -
7,400 g**



Connection
**D38, D50
y D65**



Air spray capacity
**3.4 - 15.49 m³/min
(0.5 bar)**



Air
consumption
1,720 - 22.500 l/min



Standard collector references

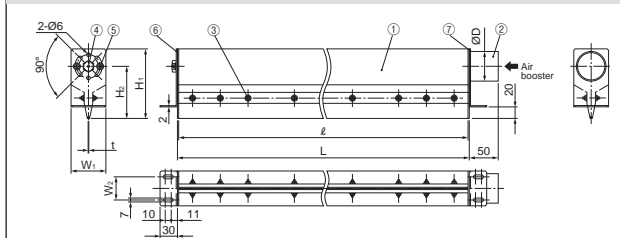
D38 **SLNB** **400** x **0.5** **S304-S-A**
Size air Length Opening
entrance of blowing of slit
D38 **400** **0.5**
D50 **600** **1**
D65 **800**
 1.000
 1.200

Blowing pattern

Flat blowing



Dimensions (mm)

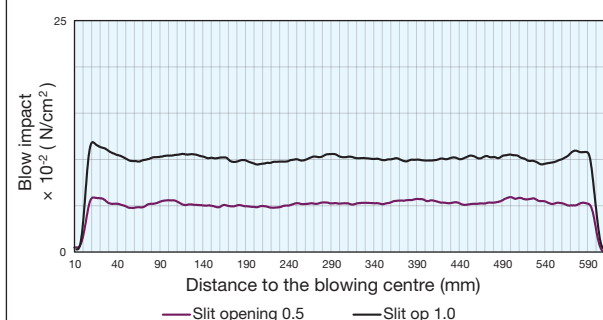


① Body ② Inlet pipe ③ Adjusting bolt (M4) ④ Bolt (M10) ⑤ Bolt (M5) ⑥ Bracket

Air inlet type	Slit length ℓ (mm)	Slit opening t (mm)	Dimensions (mm)						Mass (kg)
			L	H ₁	H ₂	W ₁	W ₂	ØD	
D38	400	0.5	404	105	80	50	30	38.0	1.9
	600		604						2.7
	800		804						3.5
	1,000		1,004						4.3
	1,200		1,204						5.9
D50	1,200		1,204	120	90	60	40	50.8	5.9
D38	400	1.0	404	105	80	50	30	38.0	1.9
	600		604	120	90	60	40	50.8	3.2
	800		804						4.1
D65	1,000		1,004	140	102.5	75	50	63.5	6.2
	1,200		1,204						7.4

The appearance and dimensions may vary slightly depending on the materials and codes of the nozzles.

Blowing power (SLNB 600 - 0.06 bar)



For specific information on some model of this series, consult one of our offices.

Slit length (mm)	Slit opening (mm)	Air consumption (m³/min, Normal)*					
		5 kPa	10 kPa	15 kPa	20 kPa	25 kPa	30 kPa
400	0.5	0.97	1.60	2.01	2.58	3.01	3.40
600		1.45	2.39	3.18	3.87	4.51	5.10
800		1.94	3.19	4.24	5.17	6.01	6.80
1,000		2.42	3.99	5.30	6.46	7.52	8.50
1,200		2.91	4.79	6.36	7.75	9.02	10.20
400	1.0	1.91	2.81	3.52	4.13	4.67	5.16
600		2.87	4.22	5.28	6.19	7.00	7.74
800		3.82	5.62	7.04	8.23	9.34	10.33
1,000		4.78	7.03	8.80	10.32	11.67	12.91
1,200		5.73	8.43	10.56	12.39	14.01	15.49

*The above air consumption is for reference only and subject to design changes.

- It allows adjustment of the spray direction in a range of 50 degrees, as well as precise alignment of the nozzle after connecting it to a pipe.
- Thread sizes available from 1/8" to 3/4" for pipe connection.
- The UT stainless steel series is designed to withstand high pressures up to 15 MPa.
- Designed for accuracy in hard to reach areas.
- Made of S303 steel. Optional in S316 steel or others.



Metallic adapter references

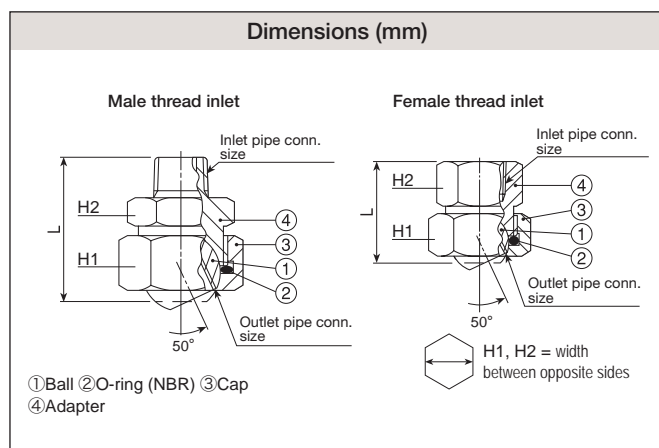
UT	1/8"M	x	1/8"F	S303
	Inlet pipe conn. size**		Outlet pipe conn. size**	
	1/8"M - 1/8"F		1/8"F	
	1/4"M - 1/4"F		1/4"F	
	3/8"M - 3/8"F		3/8"F	
	1/2"M - 1/2"F		1/2"F	
	3/4"M - 3/4"F		3/4"F	



Material
S303
O-ring NBR

***"M" indicates male thread ("R" is the ISO standard) and "F" indicates female thread ("Rc" ISO standard) example: 1/8M = R1/8", 1/8F = Rc1/8".

*Use UT-S303 at a pressure below 15 MPa.



Ball joint code (Inlet x Outlet)	Inlet pipe conn. size	Outlet pipe conn. size	Dimensions (mm)			Mass (g)	
			L	H1	H2	S303	B
UT 1/8M × 1/8F	R1/8	Rc1/8	32,5	22	21	56	60
UT 1/4M × 1/8F	R1/4	Rc1/8	36,0	22	21	60	65
UT 1/4M × 1/4F	R1/4	Rc1/4	39,5	29	24	100	110
UT 3/8M × 1/4F	R3/8	Rc1/4	40,0	29	24	110	115
UT 3/8M × 3/8F	R3/8	Rc3/8	47,5	35	30	190	205
UT 1/2M × 1/2F	R1/2	Rc1/2	54,5	41	41	325	350
UT 3/4M × 3/4F	R3/4	Rc3/4	61,5	50	46	490	525
UT 1/8F × 1/8F	Rc1/8	Rc1/8	28,5	22	21	63	69
UT 1/4F × 1/8F	Rc1/4	Rc1/8	28,5	22	21	58	63
UT 1/4F × 1/4F	Rc1/4	Rc1/4	33,5	29	24	110	120
UT 3/8F × 1/4F	Rc3/8	Rc1/4	33,5	29	24	100	110
UT 3/8F × 3/8F	Rc3/8	Rc3/8	44,5	35	30	220	235
UT 1/2F × 1/2F	Rc1/2	Rc1/2	48,5	41	41	375	405
UT 3/4F × 3/4F	Rc3/4	Rc3/4	55,5	50	46	560	600

NOTE: Do not use UT ball joint adapter under conditions where sudden change of water pressure occurs.



- It allows adjustment of the spray direction in a range of 50 degrees, as well as precise alignment of the nozzle after connecting it to a pipe.
- The spray direction can be adjusted while spraying with pressures up to 0.3 MPa.
- Without O-ring. Easy manual installation, without tools.
- Half the weight of those made of metal.
- Economical nozzle due to injection moulding.



Material
Adapter and cap: FRPP
Ball: FRPP + PP + EPDM

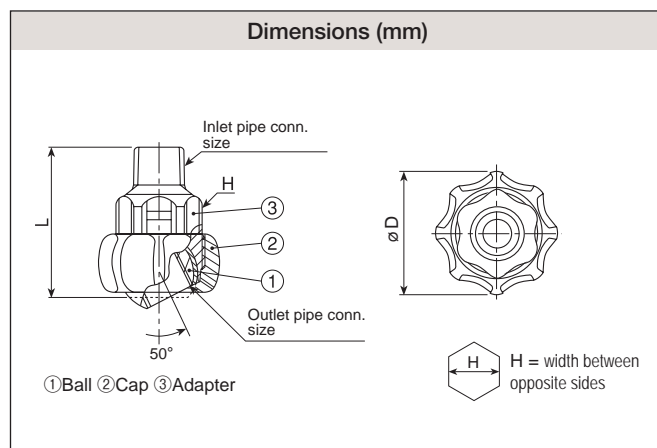


Plastic adapter references

UT	1/8" M	x	1/8" F	FRPP-IN
	Inlet pipe conn. size**		Outlet pipe conn. size**	
	1/8" M		1/8" F	
	1/4" M		1/4" F	
	3/8" M			

***"M" indicates male thread ("R" is the ISO standard) and "F" indicates female thread ("Rc" ISO standard) example: 1/8M = R1/8", 1/8F = Rc1/8".

*Use UT-FRPP at a pressure below 1 MPa (at room temperature).



Ball joint code (Inlet x Outlet)	Inlet pipe conn. size	Outlet pipe conn. size	Dimensions (mm)			Mass (g)
			L	H	ØD	
UT 1/8M x 1/8F	R1/8	Rc1/8	38.0	21	32	12
UT 1/4M x 1/8F	R1/4	Rc1/8	40.0	21	32	13
UT 1/4M x 1/4F	R1/4	Rc1/4	40.0	21	32	12
UT 3/8M x 1/8F	R3/8	Rc1/8	41.0	21	32	13
UT 3/8M x 1/4F	R3/8	Rc1/4	41.0	21	32	12

NOTE: Do not use UT ball joint adapter under conditions where sudden change of water pressure occurs.

- Possible to rotate 360° for a better adjustment of the spray direction.
- Includes lock to keep the nozzle direction fixed.
- The stabilising function suppresses the internal turbulent flow.
- Resists pressures up to 3 MPa.
- The secure design prevents parts from falling when the lock is released.
- Attachable to threaded nozzles of R1/4".



Material
Adapter: SCS13
Bolt: S303
E-ring: S304
O-ring: NBR

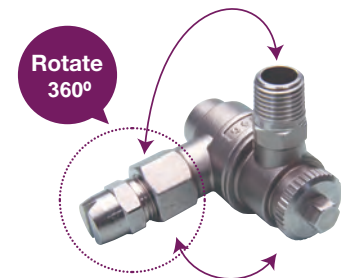


Weight
146 g

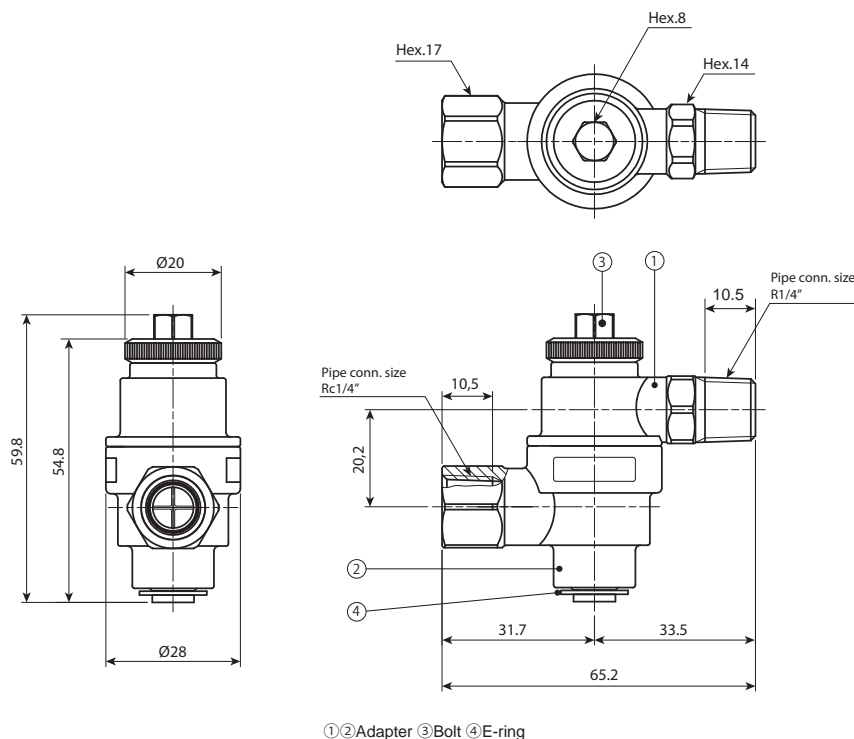


Product code
WUT 1/4M x1/4F SCS13

(Photos: WUT universal joint with a spray nozzle)



Dimensions (mm)



PRECAUTIONS FOR USE:

- The bolt may become loose due to vibration if screwed by hand. Tighten with a torque wrench to **6 Nm**.
- The maximum working pressure is **3 MPa**.
- When used with a solid stream jet nozzle, a slightly turbulent flow occurs.

Model	Distance (mm)	100	200	300
	Reference	Pressure 5 bar / 0.5 MPa		
	TF-R 8-008 S316	50	91	132
	TF-R 8-010 S316	50	91	132
	TF-R 8-012 S316	50	91	132
	TF-R 8-014 S316	50	91	132
	TF-R 8-016 S316	50	91	132
	TF-R 36-012	50	91	132
	TF-M5R 8-010	100	150	200
	TF-M5R 8-012	100	150	200
	TF-M5R 8-014	100	150	200
	TF-M5R 8-016	100	150	200
	TF-R 8-010 PP-IN	50	91	132
	TF-F 24-8-010 PPS-IN	50	91	132
	TF-FS 42-16-010 PPS	70	103	144
	TF-F 42-16-008 S316	70	103	144
	TF-F 42-16-010 S316	70	103	144
	TF-F 42-16-012 S316	70	103	144
	TF-F 121-46-010 PPS	150	143	184
	TF-F 42-16-010 PPS	70	103	144
	TF-F 50-16-012 S304	80	107	148
	HF 7-010	100	141	182

Model	Distance (mm)	100	200	300
	Reference	Pressure 5 bar / 0.5 MPa		
	HF 14-010	100	141	182
	HF 19-010	100	141	182
	VZ 150	344	544	944
	VZ 200	336	536	936
	VZ 250	329	529	929
	VZ 300	321	521	921
	VZ 350	213	513	913
	VZ 400	306	506	906
	VZ 450	298	498	898
	VZ 500	291	491	891
	VZ 550	283	483	883
	VZ 600	276	476	876
	VZ 650	268	468	868
	VZ 700	261	461	861
	VZ 750	253	453	853
	VZ 900	246	446	846
	VZ 1130	238	438	838
	CCP 1	50	91	132
	CCP 1,5	50	91	132
	CCP 2	50	91	132
	CCP 2,5	50	91	132
	TF BR ABS	50	91	132
	TF BR A5052	50	91	132
	TF-BF ABS	70	103	144
	TF-BF A5052	70	103	144
	SAP 13 (0,5 bar)	70		
	SAP 17 (0,5 bar)	70		

Unit Conversion

	μm	mm	cm	m	in	ft
Length	1	1×10^3	1×10^{-4}	1×10^{-6}	3.94×10^{-5}	3.28×10^{-6}
	1×10^3	1	0.1	1×10^{-3}	3.94×10^{-2}	3.28×10^{-3}
	1×10^4	10	1	1×10^{-2}	3.94×10^{-1}	3.28×10^{-2}
	1×10^6	1×10^3	100	1	3.94×10	3.28
	2.54×10^4	25.4	2.54	2.54×10^{-2}	1	8.33×10^{-2}
	3.05×10^5	3.05×10^2	3.05×10	3.05×10^{-1}	12	1

	cm^2	m^2	in^2	ft^2
Area	1	1×10^{-4}	0.155	1.08×10^{-3}
	1×10^4	1	1.55×10^3	10.8
	6.45	6.45×10^{-4}	1	6.94×10^{-3}
	9.30×10^2	9.30×10^{-2}	1.44×10^2	1

Others

	cm^3	ℓ	$\text{m}^3 (\text{k}\ell)$	ft^3	imperial gal.	U.S. gal.
Volume	1	1×10^{-3}	1×10^{-6}	3.53×10^{-5}	2.2×10^{-4}	2.64×10^{-4}
	1×10^3	1	1×10^{-3}	3.53×10^{-2}	0.220	0.264
	1×10^6	1×10^3	1	353	220	264
	2.83×10^4	28.3	2.83×10^{-2}	1	6.23	7.48
	4.55×10^3	4.55	4.55×10^{-3}	0.16	1	1.2
	3.79×10^3	3.79	3.79×10^{-3}	0.134	0.833	1

Viscosity	1P = 100 cP 1St = 100 cSt
Mass	1kg \approx 2.21 lb 1lb \approx 0.454 kg
Temperature	$[^\circ\text{F}] \approx ([^\circ\text{C}] \times 9/5) + 32$ $[^\circ\text{C}] \approx 5/9 ([^\circ\text{F}] - 32)$

	MPa	bar	kg/cm^2	$\text{lb}/\text{in}^2 (\text{psi})$	atm	mmHg	mmH ₂ O (mmAq)
Pressure	1	10	10.2	145	9.87	7.5×10^3	1.02×10^5
	0.1	1	1.02	14.5	0.987	750	1.02×10^4
	0.098	0.981	1	14.2	0.968	736	1×10^4
	6.89×10^{-3}	0.069	0.070	1	0.068	51.7	703
	0.101	1.01	1.03	14.7	1	760	1.03×10^4
	1.33×10^{-4}	1.33×10^{-3}	1.36×10^{-3}	0.019	1.32×10^{-3}	1	13.6
	9.81×10^{-6}	9.81×10^{-5}	1×10^{-4}	1.42×10^{-3}	9.68×10^{-5}	0.074	1

	ℓ/min	m^3/min	m^3/h	in^3/h	ft^3/h	Imperial gal./min	U.S. gal./min
Flow	1	1×10^{-3}	0.06	3.66×10^3	2.12	0.22	0.264
	1×10^3	1	60	3.66×10^6	2.12×10^3	220	264
	16.7	0.017	1	6.10×10^4	35.3	3.67	4.40
	2.73×10^{-4}	2.7×10^{-7}	1.64×10^{-5}	1	5.79×10^{-4}	6.01×10^{-5}	7.22×10^{-5}
	0.472	4.72×10^{-4}	0.028	1.73×10^3	1	0.104	0.125
	4.55	4.55×10^{-3}	0.273	1.66×10^4	9.63	1	1.20
	3.79	3.79×10^{-3}	0.227	1.39×10^4	8.02	0.833	1

The standard and optional materials available for the nozzles are shown in the material section of each series of nozzles, using the material codes listed below.

The nozzle materials and parts are detailed as well as the characteristics of resistance for each material in its exposure to the most common chemical agents in the tables. For special applications, contact us.

Metals	
Material code	Material
S303.....	Stainless steel 303
S304.....	Stainless steel 304
S316.....	Stainless steel 316
S316L.....	Stainless steel 316L
S321.....	Stainless steel 321
SCS13.....	Die-cast stainless steel equivalent to S304
SCS14.....	Die-cast stainless steel equivalent to S316

Plastics	
Material code	Material
PP.....	Polypropylene
PPS.....	Polyphenylene sulfide
HTPVC.....	Heat-treated polyvinyl chloride
PTFE.....	Polytetrafluoroethylene
PE.....	Polyethylene
ABS.....	Acrylonitrile butadiene styrene

Rubbers	
Material code	Material
FKM.....	Fluoro rubber
NBR.....	Nitrile rubber

Materials Items		Metals					Plastics						Rubbers	
		S303	S304	S316	S316L	S321	PP	PPS	HTPVC	PTFE	PE	ABS	NBR	FKM
Chemical resistance	Hydrochloric acid	×	×	×	×	×	○	○	○	○	○	△	×	○
	Concentrated hydrochloric acid	×	×	×	×	×	△	○	○	○	○	△	×	○
	Sulphuric Acid (35%)	×	×	×	×	×	○	○	○	○	○	△	×	○
	Concentrated sulphuric acid	×	×	○	○	○	×	△	○	○	△	×	×	○
	Nitric acid (35%)	○	○	○	○	○	×	△	○	○	○	×	×	○
	Concentrated nitric acid	△	○	△	△	△	×	×	×	○	×	×	×	○
	Acetic acid	△	○	○	○	○	○	○	○	○	△	×	○	○
	Caustic soda	○	○	○	○	○	○	○	○	○	○	△	○	△
	Aqueous ammonia	○	○	○	○	○	○	○	○	○	○	○	○	×
	Acetone	○	○	○	○	○	○	○	×	○	×	×	×	×
	Trichlorethylene	○	○	○	○	○	△	○	×	○	△	×	△	○
	Ethyl alcohol	○	○	○	○	○	○	○	○	○	△	△	○	○
Heat resistance	Adequate (°C)	400	400	400	400	400	80	170	50	100	60	80	90	150
	Short-term use only (°C)	800	800	800	800	800	90	180	70	150	80	90	120	200

○: Compatible △: Compatible for short term ×: Not compatible

Note: The heat resistance (operating temperature limit) of the spray nozzles varies considerably depending on the operating conditions, environment, liquid spray, etc.



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