

MATRIX | Pneumatic Division

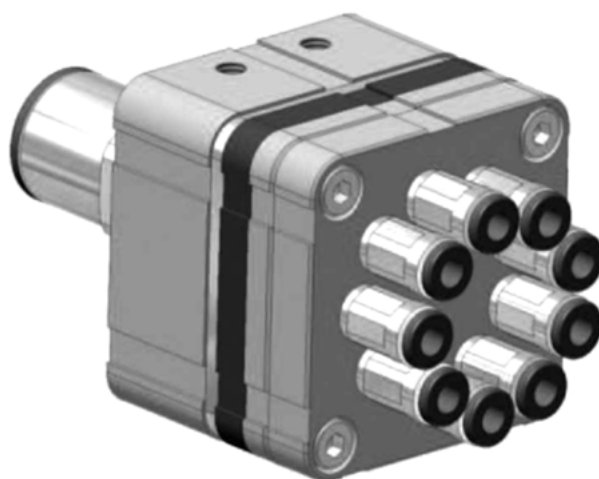
High performance ejection solutions for sorting and recycling applications

# 890 Series



Innovative patented technology, outstanding dynamic performances, ultra-fast and precise response times, proven reliability and unmatched operating life characteristics. Cost-effective flexible solutions expressly developed to match the requirements of modern sorting and recycling systems supported by professional knowhow and specific expertise

**multiejector**  
technology



MATRIX | Pneumatic Division

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## MATRIX | Pneumatic Division | 890 Series

High performance ejection solutions for sorting and recycling applications

Modern sorting and recycling systems require extremely high performances for the ejection and long operating life. To better match the technical requirements of such applications MATRIX developed a wide range of products and solutions centered on the innovative 890 Series solenoid multi-ejectors.

Based on the proven Zero Internal Friction (ZIF) patented technology, the 890 Series multi-ejectors grant unmatched dynamic performances (up to 1500 Hz) and durability characteristics over 4 billion cycles. To better accomplish the requirements of each specific application, such products are available in several flow rate, performance and mounting configurations.

### 890 Series | Model 899

High performance multi-ejectors

Modular architecture: n.9 independent 2/2 NC outlets

Flow rate: 100, 140, 180 l/min @ 6 bar x 9 outlets

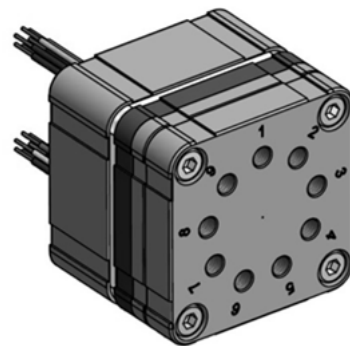
Response time: < 1 ms

Pressure range: 2-8 bar

Electric connection: IP62 integrated cables

Footprint: 46x46 mm

Weight: 230 gr



### 890 Series | Model 894

High performance multi-ejectors

Modular architecture: n.4 independent 2/2 NC outlets

Flow rate: 200, 280, 360 l/min @ 6 bar x 4 outlets

Response time: < 1 ms

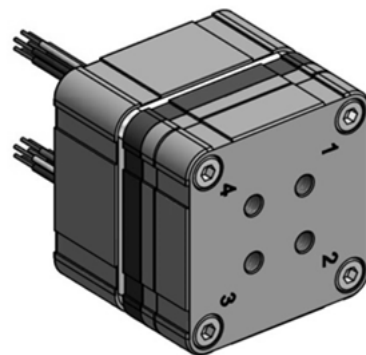
Pressure range: 2-8 bar

Electric connection: IP62 integrated cables

Footprint: 46x46 mm

Weight: 230 gr

*Also available in optional multi-flow configuration*



### 890 Series | Model 893

High performance multi-ejectors

Modular architecture: n.4 independent 2/2 NC outlets

Flow rate: 300, 400, 500 l/min @ 6 bar x 3 outlets

Response time: < 1 ms

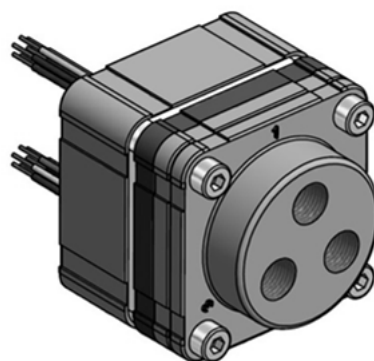
Pressure range: 2-8 bar

Electric connection: IP62 integrated cables

Footprint: 46x46 mm

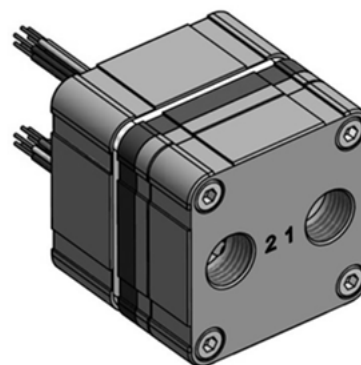
Weight: 230 gr

*Also available in optional multi-flow configuration*



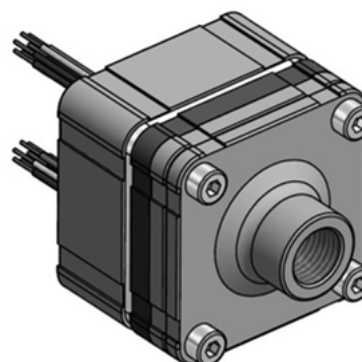
## 890 Series | Model 892

High performance multi-ejectors  
 Modular architecture: n.2 independent 2/2 NC outlets  
 Flow rate: 400, 550, 680 l/min @ 6 bar x 4 outlets  
 Response time: < 1 ms  
 Pressure range: 2-8 bar  
 Electric connection: IP62 integrated cables  
 Footprint: 46x46 mm  
 Weight: 230 gr  
*Also available in optional multi-flow configuration*



## 890 Series | Model 891

High performance multi-ejectors  
 Modular architecture: n.1 2/2 NC outlet  
 Flow rate: 900, 1200, 1600 l/min @ 6 bar x 1 outlet  
 Response time: < 1 ms  
 Pressure range: 2-8 bar  
 Electric connection: IP62 integrated cables  
 Footprint: 46x46 mm  
 Weight: 230 gr  
*Also available in optional multi-flow configuration*



## 890 Series | Typical configurations

Product Series   Model	Flow rate	P range	Max freq.	Service life	Footprint	Cfg.
890 Series   MX899	100 l/min x 9 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   MX899	100 l/min x 9 @ 6 bar	2-4 bar	500 Hz	4 bln cycles	46 x 46 mm	KE
890 Series   MX899	50 l/min x 9 @ 4 bar	2-4 bar	1000 Hz	4 bln cycles	46 x 46 mm	H4
890 Series   MX899	50 l/min x 9 @ 4 bar	2-4 bar	1500 Hz	4 bln cycles	46 x 46 mm	H5
890 Series   NX899	140 l/min x 9 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   NX899	85 l/min x 9 @ 4 bar	2-4 bar	500 Hz	4 bln cycles	46 x 46 mm	KE
890 Series   OX899	170 l/min x 9 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   OX899	105 l/min x 9 @ 4 bar	2-4 bar	500 Hz	4 bln cycles	46 x 46 mm	KE
890 Series   MX894	200 l/min x 4 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   NX894	280 l/min x 4 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   OX894	360 l/min x 4 @ 6 bar	2-8 bar	400 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   MX893	300 l/min x 3 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   NX893	420 l/min x 3 @ 6 bar	2-8 bar	500 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   OX893	520 l/min x 3 @ 6 bar	2-8 bar	400 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   MX892	400 l/min x 2 @ 6 bar	2-8 bar	450 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   NX892	550 l/min x 2 @ 6 bar	2-8 bar	400 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   OX892	680 l/min x 2 @ 6 bar	2-8 bar	400 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   MX891	900 l/min x 1 @ 6 bar	2-8 bar	450 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   NX891	1260 l/min x 1 @ 6 bar	2-8 bar	400 Hz	0,5 bln cycles	46 x 46 mm	KK
890 Series   OX891	1600 l/min x 1 @ 6 bar	2-8 bar	350 Hz	0,5 bln cycles	46 x 46 mm	KK

## GMN890 Series

High performance compressed air supply manifold units and nozzle manifolds

To further support the integration of the 890 Series multi-ejectors in each specific sorting system, MATRIX developed several specific solutions capable to simplify the pneumatic circuit layout and remarkably improve the performance and reliability of the sorting process. In order to match the requirements of each application such solutions include compressed air supply manifolds, nozzles manifolds, integrated ejection modules, multi-channel speed-up driver boards and custom plug-in units. The expertise and knowhow guaranteed by our engineering team, the innovative technologic platform and the attitude for cooperation are key factors of our successful solutions.

Outlets / nozzles: multiples of 8 or 9 (depending on the multi-ejectors configuration)

Flow rate configurations: depending on 890 Series multi-ejector ejector model

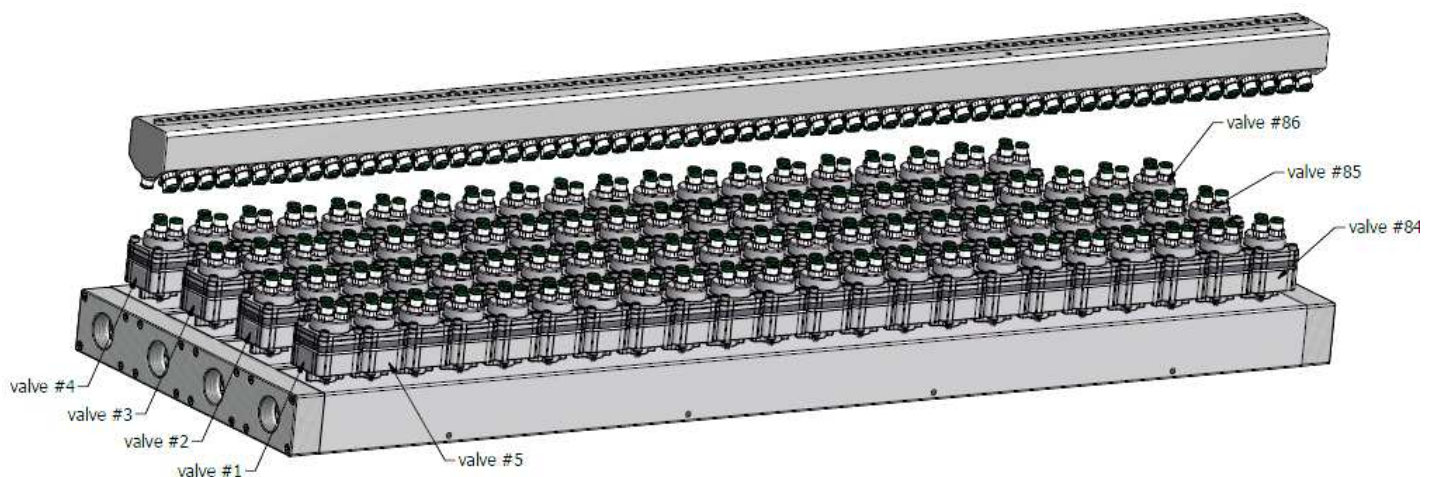
Response time: down to 1 ms

Pressure range: 2-8 bar

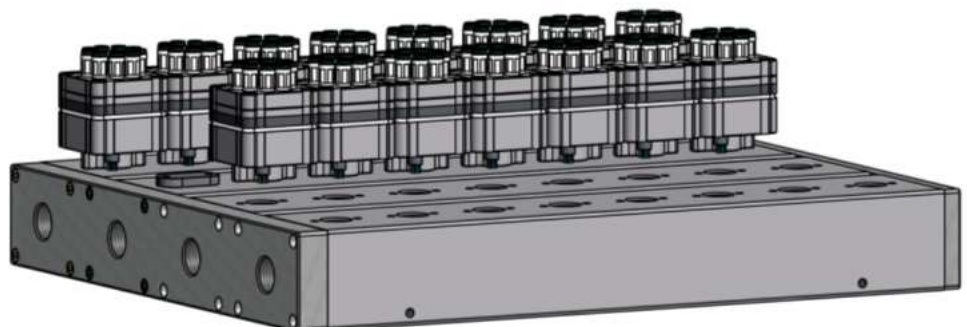
Electric connections: IP62 integrated cables

Pneumatic connections: depending on design

*Custom configurations available upon request*



Made of high quality aluminum alloy precisely machined they allow a remarkable layout optimization and eliminate all possible contamination issues related to the air quality or manufacturing processes being 100% inspected and tested. This flexible solution can be tailored to fit each equipment type concerning the flow rate, the number of nozzles, the pitch and several other features. The compressed air supply manifolds are designed for the direct mounting of the 890 Series multi-ejectors and to properly grant the required air volume. The system is equipped with a nozzles manifold with push-in fittings designed upon the specifications of each application.



## Ejection nozzle manifolds

Modular ejection nozzles manifolds

Nozzles design: circular or rectangular

Nozzles size / diameter: depending on ejector model and application

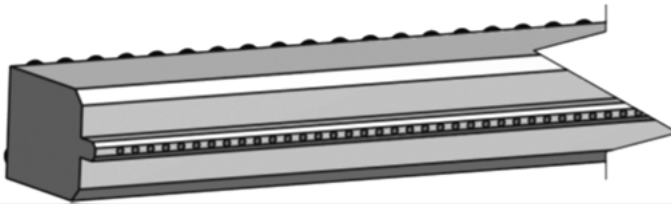
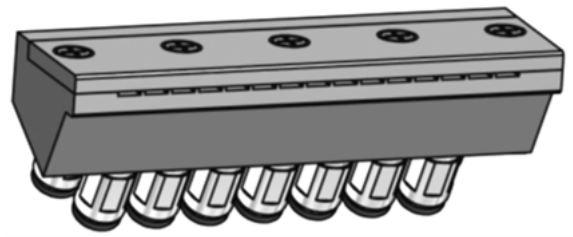
Shape: customizable

Pitch: from 2,35 mm\* (depending on ejector model and configuration)

Pneumatic connections: push-in fittings

*Custom configurations available upon request*

\* single row



Professional knowhow in fluid dynamics and years of experience in the field lead to the design of specialized nozzle manifolds focused on general purpose applications or product specific requirements. Made of high quality aluminum alloy these units offer the highest quality and precision to perfectly match the requirements of each system layout.

## HSDB930 | HSDB990 Series

High performance multi-channel speed-up driver boards

Number of channels: up to 9

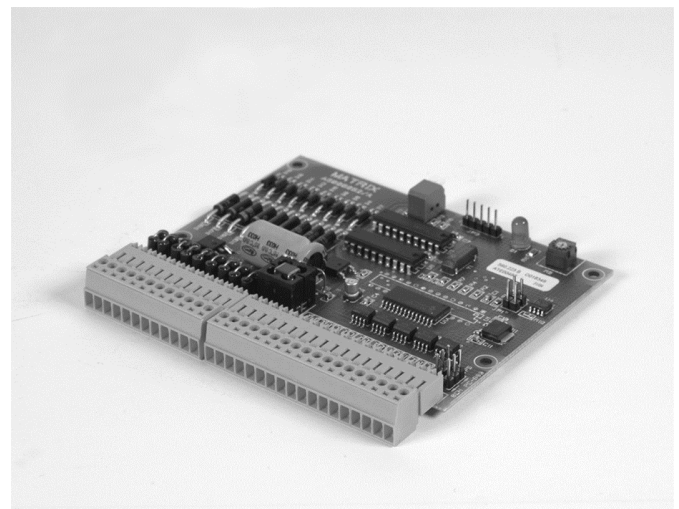
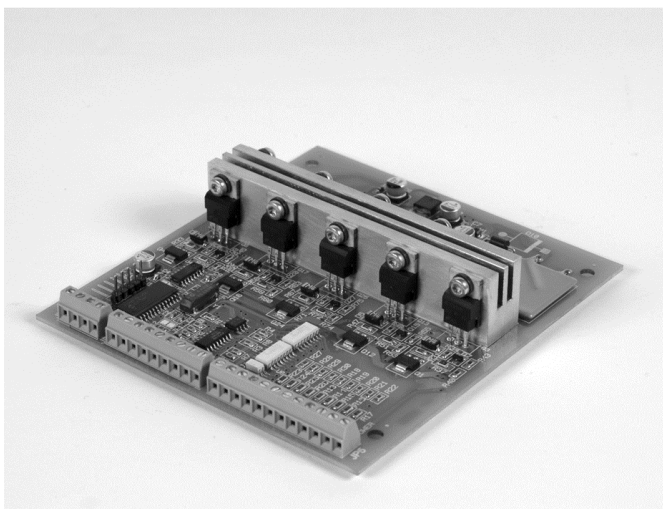
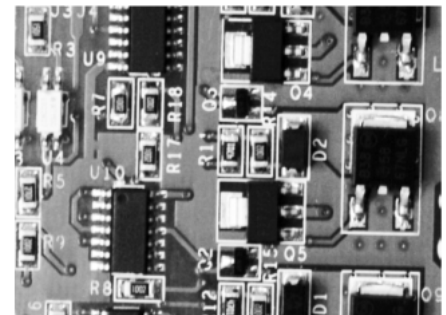
Power supply: 24 VDC

Logic input signals: 5 - 24 VDC

Max operating frequency: 500 Hz (depending on ejector model and configuration)

Electric connections: terminal block, multiple board connectors

*Custom configurations available upon request*

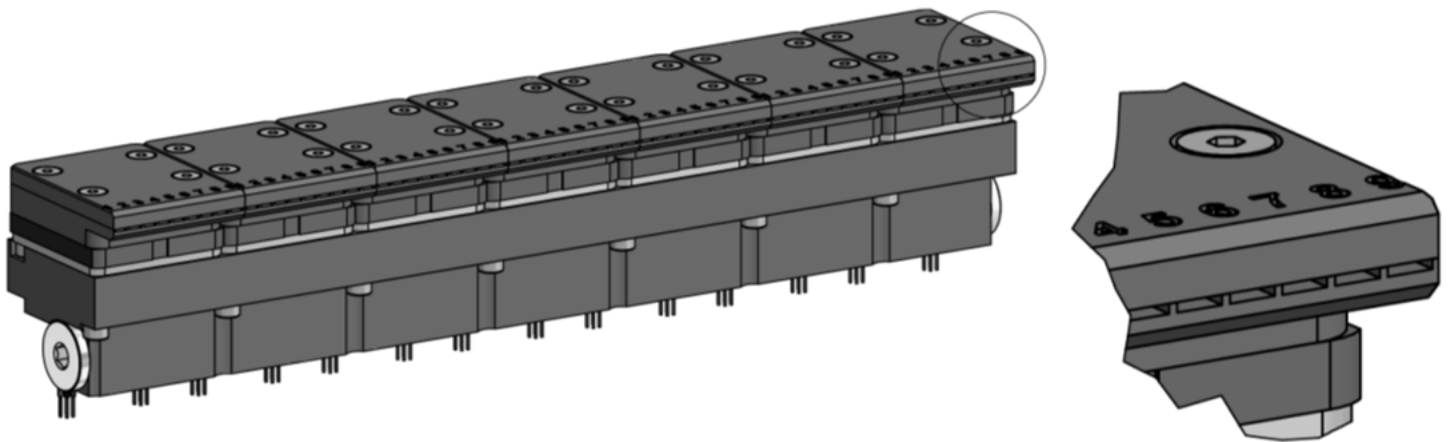


## GS890 Series integrated ejection modules for rice sorting applications



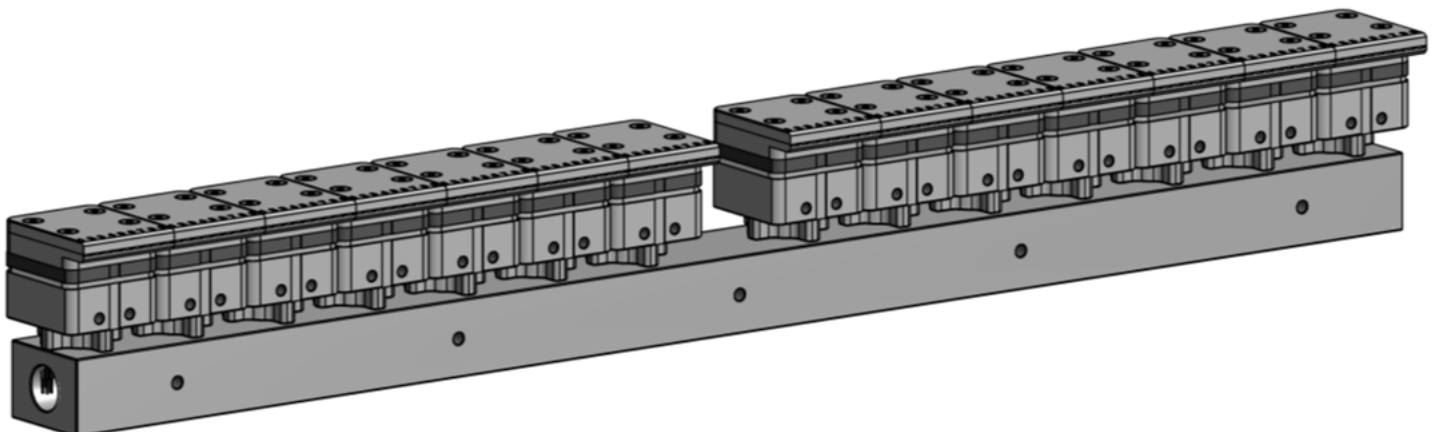
A continuous improvement process led to the design of an innovative technical solution for rice and seeds sorting machines capable to revolutionize their current layout, characterized by extremely high dynamic performances and optimal system integration.

In order to further improve the unmatched performances of the 890 Series multi-ejectors and better accomplish the increasing requirements of modern rice and seeds sorting equipments, this solution includes in a compact design a compressed air supply manifold supporting a special 890 Series multi-ejectors configuration with an integrated modular nozzles interface with equalized rectangular outlets. Each module can be customized to perfectly match the slides/chutes design and the required number of nozzles.

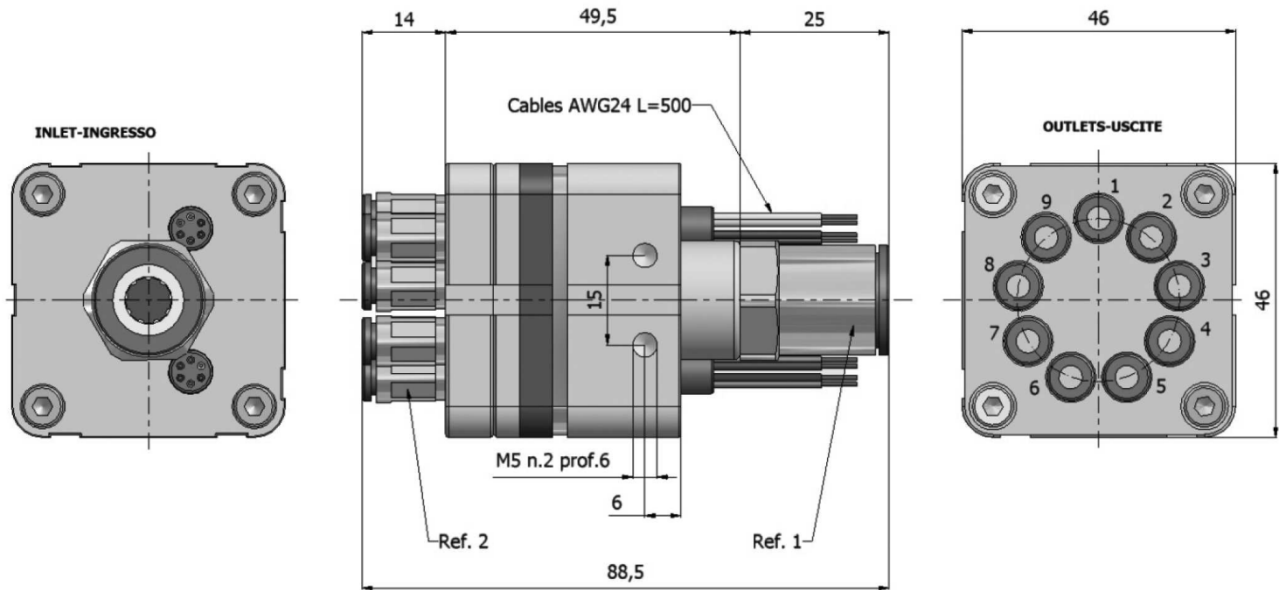


Aside from the proven performance and reliability typical of the 890 Series multi-ejectors, this innovative technical solution grants the following remarkable advantages:

- overall pneumatic system optimization (compact dimensions, reduced pneumatic connections, integrated air supply manifold, integrated nozzles, shortened air passages)
- 100% functional and quality inspection of the whole pneumatic circuit
- plug-in solutions for easier and trouble-free installation
- individual multi-ejectors easily replaceable
- innovative modular design to easily fit different sorter configurations and number of chutes
- available in several flow rate configurations (100, 140 or 180 l/min. at 6 bar)
- cost effective and flexible solution

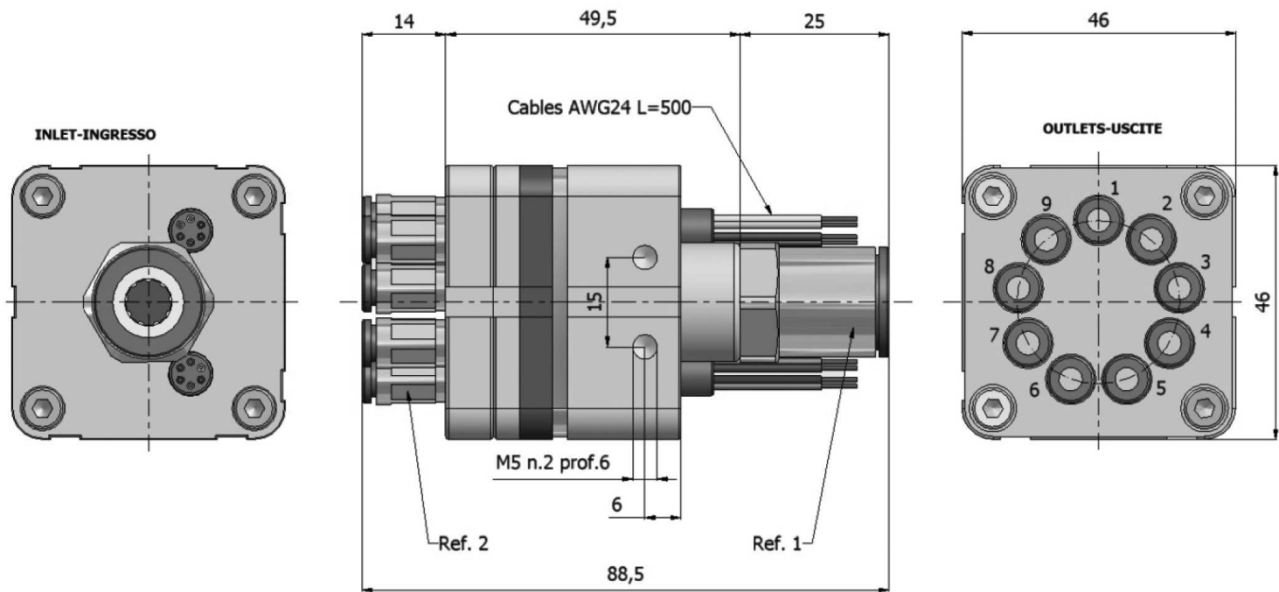


## 890 Series | Model 899 | MX899 configurations



Part number	<b>MX899900C2KK</b>	<b>MX89990XC2KE</b> <small>NEW</small>	<b>MX89990XC2H4</b> <small>NEW</small>	<b>MX89990XC2H5</b> <small>NEW</small>
Type   Function	2/2   NC	2/2   NC	2/2   NC	2/2   NC
Media	Non-lubricated dry air	Non-lubricated dry air	Non-lubricated dry air	Non-lubricated dry air
Media temp. range	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C
Operating temp. range	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C
Filtration requirement	40µ	40µ	40µ	40µ
Lubrication	Not required	Not required	Not required	Not required
Max operating frequency (2-4 bar)	500 Hz	500 Hz	1000 Hz	1500 Hz
Max duty cycle (@ max freq.)	50 %	50 %	50 %	50 - 54 %
Service life	0,5 bln cycles	4 bln cycles	4 bln cycles	4 bln cycles
Max leakage	0,2 sccm	0,2 sccm	0,2 sccm	0,2 sccm
IP protection class	IP62	IP62	IP62	IP62
Pressure range	2-8 bar	2-4 bar	2-4 bar	2-4 bar
Static flow rate	100 l/min @ 6 bar	65 l/min @ 4 bar	50 l/min @ 4 bar	50 l/min @ 4 bar
Opening response time	0,9 ms @ 4 bar	0,9 ms @ 4 bar	0,8 ms @ 4 bar	0,6 ms @ 4 bar
Closing response time	0,9 ms @ 4 bar	0,9 ms @ 4 bar	0,5 ms @ 4 bar	0,5 ms @ 4 bar
P=0 to P=max	< 0,5 ms	< 0,5 ms	< 0,2 ms	< 0,2 ms
P=max to P=0	< 0,5 ms	< 0,5 ms	< 0,2 ms	< 0,2 ms
Coil resistance	27 Ohm	27 Ohm	15 Ohm	8 Ohm
Speed-up voltage	24 VDC	24 VDC	24 VDC	24 VDC
Typical speed-up time	1 ms @ 4 bar	1 ms @ 4 bar	0,55 ms @ 4 bar	0,36 ms @ 4 bar
Speed-up current	0,8 Amp	0,8 Amp	0,8 Amp	1,2 Amp
Holding voltage	5 VDC	5 VDC	5 VDC	2,5 VDC
Holding current	0,2 Amp	0,2 Amp	0,3 Amp	0,3 Amp
Holding power consumption	1 W	1 W	1,5 W	0,8 W

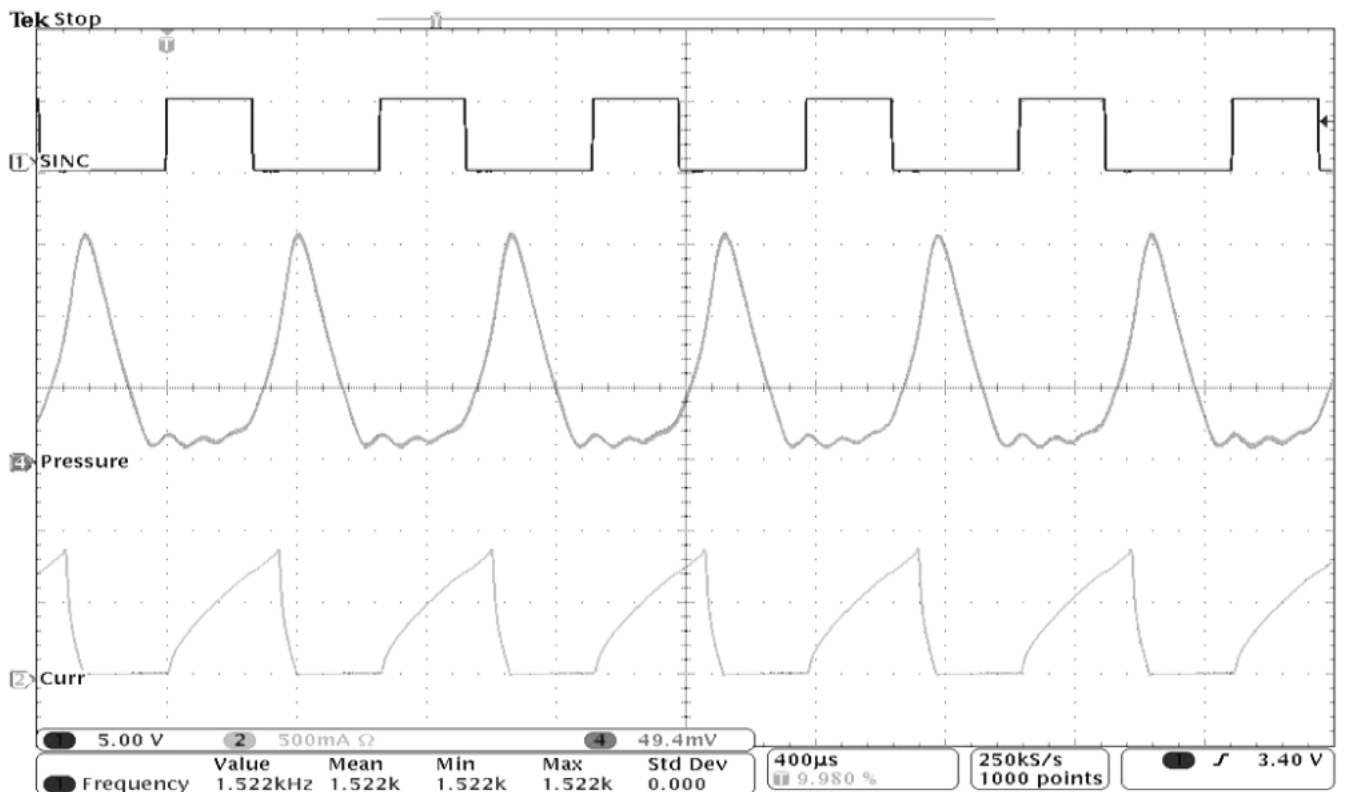
## 890 Series | Model 899 | NX899 and OX899 configurations



Partnumber	<b>NX899900C2KK</b>	<b>NX89990XC2KE</b> <small>NEW</small>	<b>OX899900C2KK</b>	<b>OX89990XC2KE</b> <small>NEW</small>
Type   Function	2/2   NC	2/2   NC	2/2   NC	2/2   NC
Media	Non-lubricated dry air	Non-lubricated dry air	Non-lubricated dry air	Non-lubricated dry air
Media temp. range	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C
Operating temp. range	-10°C to +50°C 90%Rh max	-10°C to +50°C	-10°C to +50°C	-10°C to +50°C
Filtration requirement	40µ	40µ	40µ	40µ
Lubrication	Not required	Not required	Not required	Not required
Max operating frequency (2-4 bar)	500 Hz	500 Hz	500 Hz	500 Hz
Max duty cycle (@ max freq.)	50%	50%	50%	50%
Service life	0,5 bln cycles	4 bln cycles	0,5 bln cycles	4 bln cycles
Max leakage	0,2 sccm	0,2 sccm	0,2 sccm	0,2 sccm
IP protection class	IP62	IP62	IP62	IP62
Pressure range	2-8 bar	2-4 bar	2-8 bar	2-4 bar
Static flow rate	140 l/min @ 6 bar	85 l/min @ 4 bar	170 l/min @ 6 bar	105 l/min @ 4 bar
Opening response time	1,1 ms @ 4 bar	1,1ms @ 4 bar	1,3 ms @ 4 bar	1,3 ms @ 4 bar
Closing response time	0,9 ms @ 4 bar	0,9 ms @ 4 bar	0,9 ms @ 4 bar	0,9 ms @ 4 bar
P=0 to P=max	< 1 ms	< 1 ms	< 1 ms	< 1 ms
P=max to P=0	< 1 ms	< 1 ms	< 1 ms	< 1 ms
Coil resistance	27 Ohm	27 Ohm	27 Ohm	27 Ohm
Speed-up voltage	24 VDC	24 VDC	24 VDC	24 VDC
Typical speed-up time	1,2 ms @ 4 bar	1,2 ms @ 4 bar	1,4 ms @ 4 bar	1,4 ms @ 4 bar
Speed-up current	0,8 Amp	0,8 Amp	0,8 Amp	0,8 Amp
Holding voltage	5 VDC	5 VDC	5 VDC	5 VDC
Holding current	0,2 Amp	0,2 Amp	0,2 Amp	0,2 Amp
Holding power consumption	1 W	1 W	1 W	1 W



## 890 Series | MX89990XC2H5 performance test



## 890 Series | Typical sorting and recycling applications

Industrial processing systems based on optical (line-scan CCD cameras), metal detection, X-ray, laser, NIR, multi-sensors or chemical analysis for products classification and separation or contaminants and defective products removal.

Food industry: rice, nuts, seeds, cereals, legumes, corn, blackberries, blueberries, olives, fruit, coffee, tea, beans, peas, lentils, pistachios, dried fruit and vegetables, fresh cut, diced fruit and vegetables, salads, seafood, etc.

Plastic industry: plastic flakes (PET, PE, PP, PVC), pellet, bulk products, etc.

Chemical / Pharmaceutical industry: pills, tablets, bulk products

Mining / Natural resources industry: industrial minerals (calcite, limestone, quartz, talc, salt, feldspar, etc.), ferrous and non-ferrous metals (iron, nickel, copper, aluminum, etc.), precious metals (gold, silver, platinum, etc.), gemstones (diamonds, emeralds, rubies, etc.), ore, coal, sand, gravel, etc.

Recycling industry: glass cullet, plastics, metals, wood, paper, e-waste, household waste, automotive recycling, etc.

Other industries: raw materials, bulk products, tobacco, etc.

## AOD | Application Oriented Development

MATRIX Pneumatic Division has long been committed in the design and development of innovative technical solutions focused on the fulfillment of the technical requirements of all applications where compact dimensions, high dynamic performances and long lasting operating life are success key factors.

These solutions are the result of the Application Oriented Development approach sponsored by MATRIX, whereby the Company knowhow, skills and technology allow to offer custom tailored solutions based on the specific needs of each application and offering new perspectives and design opportunities.

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