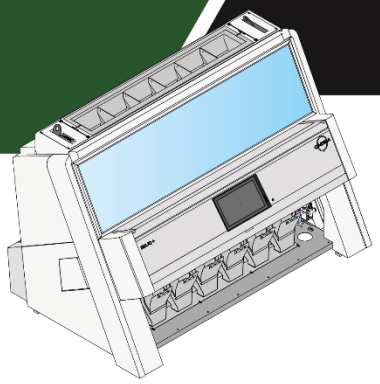
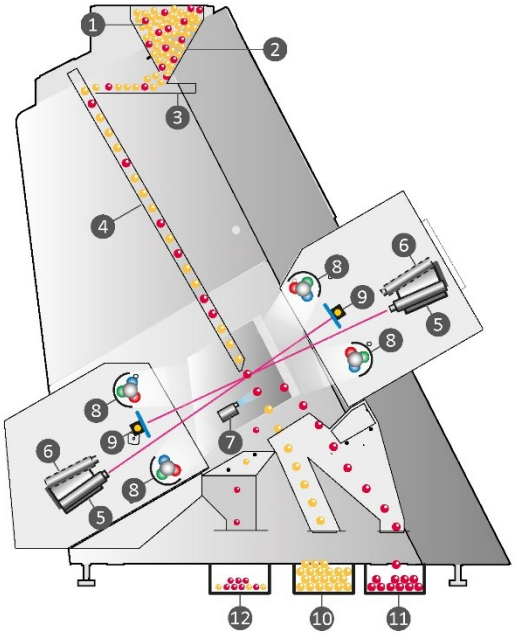
Optical Sorting

# SEA.IQ PLUS



As standard in the basic version, the **SEA.IQ PLUS** color sorting machine from Cimbria offers the **highest multispectral Full-Color technology with built-in ultra-high resolution NIR infrared, can be combined with SWIR multispectral cameras** to meet the most demanding quality standards in any application field



## PROCESS

1. Product to sort
2. In-feed hopper
3. Vibrating feeder
4. Feeding chute
5. Full-Color cameras with integrated NIR
6. InGaAs cameras (optional)
7. Ejectors
8. Lights
9. Backlights
10. Sorted flow output
11. Reject flow output
12. Bounce output


## MAIN CHARACTERISTICS

- Up to 4 sections for simultaneous resorting
- Available configured with re-sorting, re-resorting or reverse sorting
- Image acquisition perfectly conform to reality
- Color analysis like that of the human eye
- Can be controlled and reprogrammed even remotely with the customer's specific recipes

## ELECTRONICS

- Easy-to-replace electronic boards
- Auto-diagnostics and auto-calibration functions ensure operational best performances
- Ethernet connection allows real-time monitoring and remote assistance
- OPC System (option)

## EXPULSION SYSTEM

- Standard 5 mm pitch - N.63 Ejectors per chute
- 3.3 mm pitch (option) - N. 96 Ejectors per chute
- Solenoid valves working speed up to 1,000 cycles /s, guaranteed up to 2 billion cycles
- Time and duration of ejection adjusted according to needs

## OPTICAL SYSTEM

- The basic version uses Full-color RGB multispectral cameras with integrated NIR (front /rear) with 4096 pixels. The inspection system recognizes 16 million colors plus infrared which combined with an optical resolution of 0.08 mm sees beyond the human eye
- Additional SWIR InGaAs cameras
- 25,000 Hz scan speed
- The software can check up to 14 families of defects
- Shape-sizing (shape control) integrated in the system
- Control and adjustment of the size of the defects
- Active LED light and background

## MECHANICS

- 320 mm wide chutes
- Available from 1 to 6 channels
- Splitting of a channel in 50:50 (optional)
- Pressurization and airtight structure prevent dust entering
- Automatic programmable cleaning system
- Cooling system to grants the ideal temperature inside the optical boxes
- Simplified maintenance and cleaning
- Pre-arrangement for the aspiration system installation



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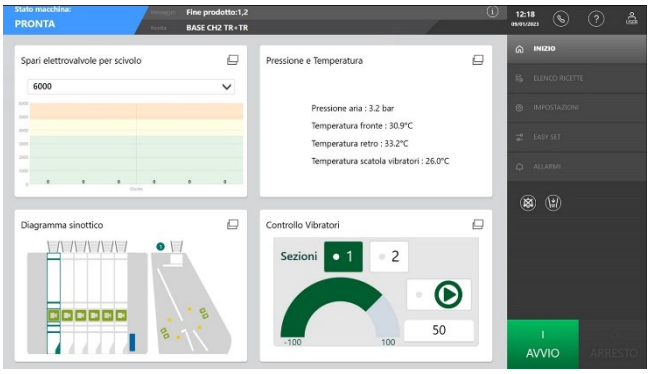
## HMI

- Windows 10® operating system allows easy use and smart connection to customer networks
- High visibility in low light conditions thanks to its HD 21,5"full color touch screen
- Intuitive graphics and multilingual interface to program and control recipies in an easy and fast way
- Easily customizable recipes with no storage limit, named according to the operator's needs
- Mark-good mark-bad function
- Out of good programming mode
- Active synoptic system with machine status (vibrators and sensitivity)
- Machine status and control of the production capacity
- Real-time statistics (e.g. rejects/s, throughput, reject/channel and others)
- Data backup
- Product control inside the hopper (level sensors)
- PLC status
- Alarms and instructions to restore functionality



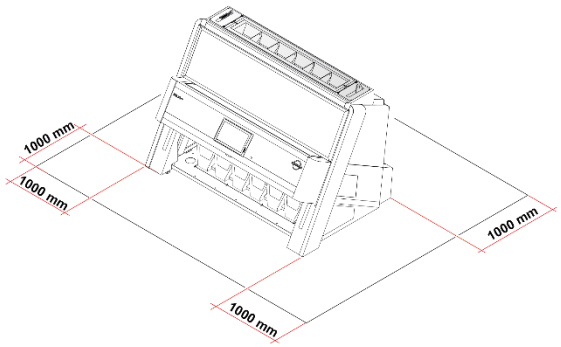

## SEA.IQ PLUS CONFIGURATION

| Front | |
|---|---|
| **SEA.IQ PLUS** | **Standard version: Full-Color RGB cameras + integrated NIR /channel (front /rear) – 5 mm pitch** |
| **SEA.IQ PLUS R** | **Standard version + additional multi-frequency SWIR cameras on the rear – 5 mm pitch** |
| **SEA.IQ PLUS RR** | **Standard version + additional multi-frequency SWIR cameras on the front and rear – 5 mm pitch** |
| **SEA.IQ PLUS s** | **Standard version: Full-Color RGB cameras + integrated NIR /channel (front /rear) – 3.3 mm pitch** |
| **SEA.IQ PLUS Rs** | **Standard version + additional multi-frequency SWIR cameras on the rear – 3.3 mm pitch** |
| **SEA.IQ PLUS RRs** | **Standard version + additional multi-frequency SWIR cameras on the front and rear – 3.3 mm pitch** |

* On request, the pre-wired **Plus** version is available to accept additional cameras in future

## EXTERNAL EQUIPMENT REQUIRED FOR THE CORRECT WORKING*

- 230 V - 50 Hz single-phase power supply
- Voltage stabilizer (strictly necessary)
- Pneumatic system including rotary compressor, tank, filters and dryer
  - ISO 8573-1:2010 [5:4:3] for NON-FOOD PRODUCTS *
  - ISO 8573-1:2010 [1.2.1] for FOOD PRODUCTS *[1]
- 1" minimum diameter air supply hose
- Supporting frame (Minimum one meter of free space each sides)
- Infeed and discharging hoppers (optional Cimbria supply)
- Product conveyors systems
- Fast internet connection




**** Customer must provide and install the above***
****[1] Minimum legal requirements***

****Leave at least one meter of free space around the sorter***



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# SEA.IQ PLUS

## TECHNICAL DATA

- White RAL 9003 Standard (custom colors as option)
- Working temperature in workrooms min +5°C max+35°C
- IP 55 protection
- CE conformity certificate
- 2006/42/CE on machinery safety
- 2014/30/CE on Electromagnetic Compatibility
- Compatible with UL and CSA standards
- ATEX standards Certificate (option)
- MOCA certificate (option)

## MACHINE TECHNICAL DATA

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |
| No. of vibrating feeders/chutes | | 1 | 2 | 3 | 4 | 5 | 6 |
| No. of cameras (front+rear) | | 2-4 | 4-8 | 6-12 | 8-16 | 10-20 | 12-24 |
| No. ejectors/chutes 5 mm pitch | | 63 | 126 | 189 | 252 | 315 | 378 |
| No. ejectors/chutes 3,3 mm pitch | | 96 | 192 | 288 | 384 | 480 | 576 |
| Compressed air consumption (max value at 6 bar) | l/min | 320 | 640 | 960 | 1280 | 1600 | 1920 |
| | $m^3/h$ | 19 | 38 | 58 | 77 | 96 | 115 |
| Compressed air hose | Ø [inch] | 1" | | | | | |
| Power supply/frequency | V/Hz | 230V – 50/60 Hz | | | | | |
| Power absorption 5 mm pitch (max. value) | A | 4 | 5,9 | 9,8 | 11,7 | 14,6 | 16,5 |
| Power consumption 5 mm pitch (max. value) | Kw | 0,9 | 1,3 | 2,1 | 2,5 | 3,2 | 3,6 |
| Power absorption 3,3 mm pitch (max. value) | A | 4,3 | 6,6 | 10,9 | 13,1 | 16,4 | 18,7 |
| Power consumption 3,3 mm pitch (max. value) | Kw | 1 | 1,5 | 2,3 | 2,8 | 3,6 | 4 |
| Intake manifold | n° | 1 | 2 | 2 | 2 | 2 | 2 |
| Manifold diameter | Ø [mm] | 100 | 100 | 118 | 118 | 118 | 118 |

## ASPIRATION SYSTEM

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $m^3/h$ | l/min | $m^3/h$ | l/min | $m^3/h$ | l/min | $m^3/h$ | l/min | $m^3/h$ | l/min | $m^3/h$ | l/min |
| **Air Aspiration** | 500 | 8333 | 1000 | 16667 | 1500 | 25000 | 1500 | 25000 | 2500 | 41667 | 2500 | 41667 |

*For a correct use of the aspiration system consider a head of 150mm $H^2O$ (~0.015 bar)
**Minimum flow values required to the machine to process a highly polluted product

## DIMENSIONS (mm/in)

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | in | mm | in | mm | in | mm | in | mm | in | mm | in |
| **Length** | 1720 | 67,71 | 1720 | 67,71 | 2400 | 94,49 | 2400 | 94,49 | 3100 | 122,04 | 3100 | 122,04 |
| **Width** | 1887 | 74,29 | 1887 | 74,29 | 1887 | 74,29 | 1887 | 74,29 | 1887 | 74,29 | 1887 | 74,29 |
| **Height** | 2090 | 82,28 | 2090 | 82,28 | 2090 | 82,28 | 2090 | 82,28 | 2090 | 82,28 | 2090 | 82,28 |

## WEIGHT (Kg/lbs)

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kg | lbs | Kg | lbs | Kg | lbs | Kg | lbs | Kg | lbs | Kg | lbs |
| **Weigh** | 970 | 2138 | 1050 | 2315 | 1220 | 2690 | 1500 | 3307 | 1520 | 3351 | 1600 | 3527 |



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