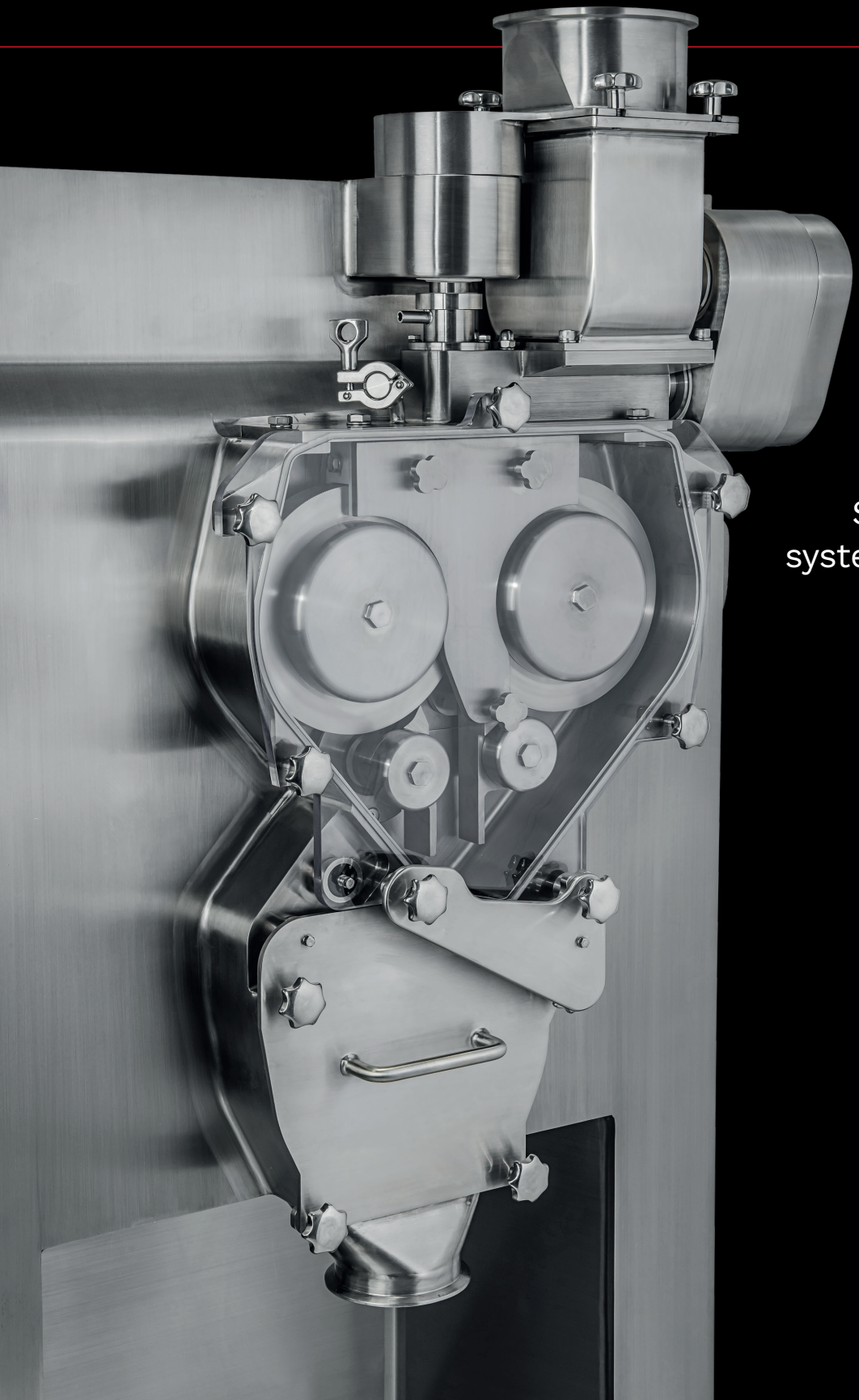
# CCS SERIES
## CONTAINED COMPACTION SYSTEMS



Scalable dry granulation systems for pharmaceutical, chemical and food applications

FITZPATRICK®

# FITZPATRICK CCS SERIES
## THE PERFECT CONTAINED COMPACTION SOLUTION

**Fitzpatrick is committed to improving the performance and profitability of our customers' powder processing operations.**

**We continually invest in customer-driven innovative solutions and provide long-term global support via our highly technical customer service and spare parts network.**

### Scalability from lab to full production

Fitzpatrick's CCS Series offers a truly scalable equipment growth path. As customers progress from research and development all the way through to full production, results obtained on the smaller models are fully transferable to the larger systems.
**Learn more, page 6.**

### Simple controls aiding an automated, repeatable process

Fitzpatrick's CCS Series is delivered with intuitive, easy-to-understand software powering fully automated controls, thereby removing the risk of human error.
**Learn more, page 8.**

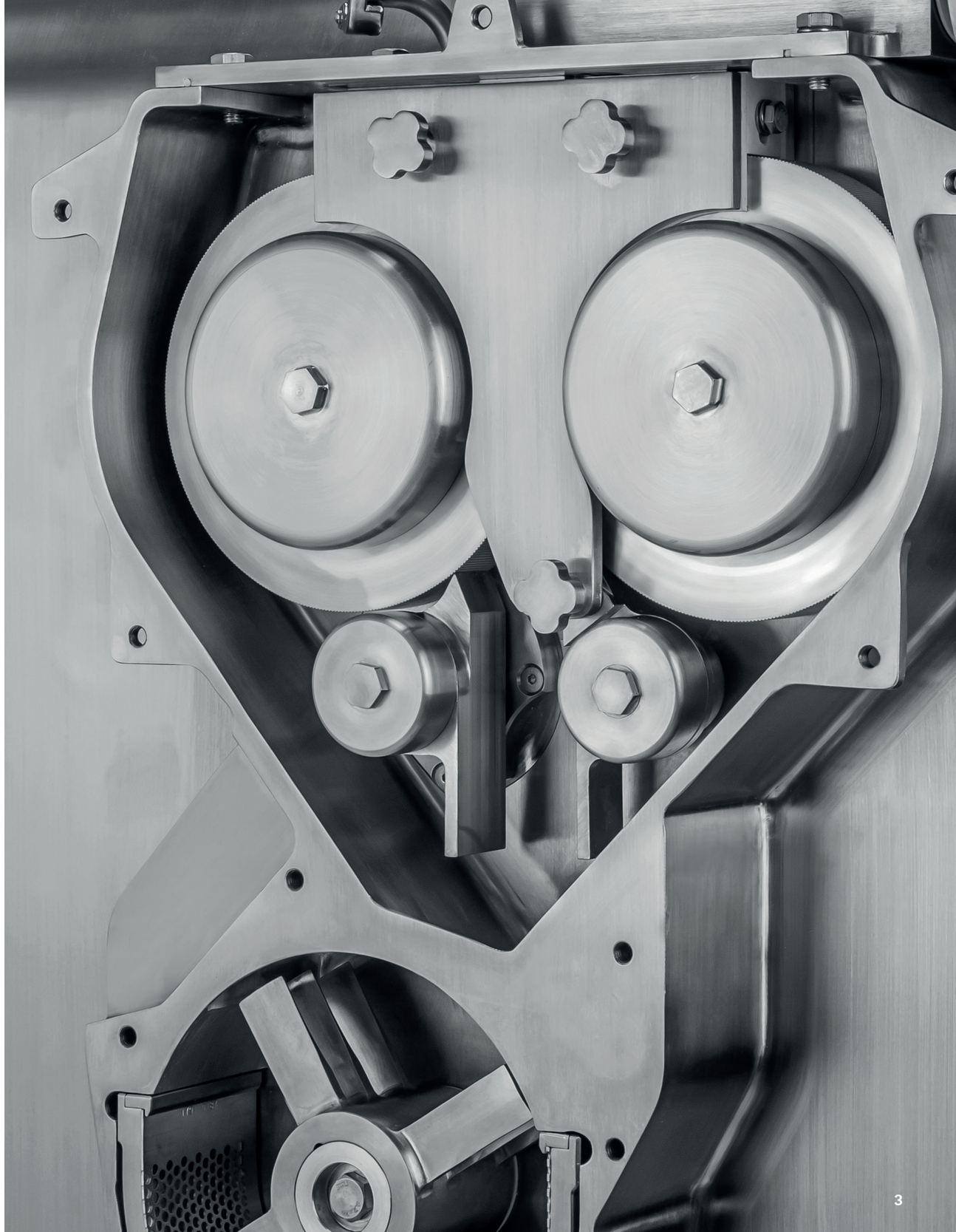
### Class-leading product design and manufacturing, built to last

Fitzpatrick's longevity and diverse process experience has helped to steer the design of world-class products and enhanced engineering capabilities.
**Learn more, page 10.**

### Improved profitability with minimal maintenance and reduced downtime

Fitzpatrick's CCS Series has been designed with the user in mind. Equipment is simple to maintain with fewer parts to remove during cleaning cycles, maximizing up-time.
**Learn more, page 12.**

RECOGNIZED AS A WORLD LEADER IN ROLL COMPACTION EQUIPMENT FOR DRY GRANULATION



# MARKET LEADING DESIGN
## IMPROVES END PRODUCT CONSISTENCY

1. Scalable compaction production from 200 g to 400 kg/hr
2. Precise dosing from automatically adjusting feed screw
3. Pre-compression screw provides uniform feed to the rolls
4. Precision parallel floating rolls ensure uniform compaction force for ribbon consistency
5. Fewer parts result in reduced maintenance and production downtime
6. Manual or automatic control through operator interface
7. Wider selection of milling options over competitor products due to variety of rotor and screen combinations
8. Optional Product Containment System minimizes exposure and prevents contamination
9. Optional in-wall configuration for maintenance outside clean room

# SCALABILITY
# FROM LAB TO FULL PRODUCTION

**Fitzpatrick's CCS Series offers a truly scalable equipment growth path. As customers progress from research and development all the way through to full production, results obtained on the smaller models are fully transferable to the larger systems.**

Additionally, the intuitive software and built-in security and administrative controls are consistent throughout the CCS Series range.

As your production requirements grow, the CCS Series grows with you, without the need for additional training.

BENCHTOP

SMALL VOLUME

PRODUCTION

MAXIMUM VOLUME

## LCS

**Low-volume benchtop system for R&D & trial batch production**

**Roll Dimension:** 1.5 x 12 cm

- Ideal for proof-of-concept work or for smallest volume production.
- Reliable conversion from R&D to production.
- Production level compaction ensures a quality compact comparable to full-scale models.

## CCS**220**

**Ideal for R&D proof of concept**

**Roll Dimension:** 2 x 20 cm

## CCS**320**

**Ideal for small volume / pilot production**

**Roll Dimension:** 3 x 20 cm

- Consistent roll diameter enables superior scale-up to production machines.
- Compact, and easily mobile.
- Lab / pilot conversion kits allow for reciprocal conversion between CCS220 and CCS320 models, depending on whether higher pressure or higher capacity is required.

## CCS**520**

**For mid-sized production-scale capacity**

**Roll Dimension:** 5 x 20 cm

## CCS**720**

**Designed for large production-scale capacities**

**Roll Dimension:** 7.5 x 20 cm

- Suitable for both free-standing or in-wall installations.
- In-wall installation minimizes clean room space requirements and allows for internal maintenance access without the need for PPE.
- Optional Product Containment System (PCS) minimizes operator exposure to active ingredients and prevents product loss or contamination.

## CCS**1025**

**The maximum volume capacity in the CCS range**

**Roll Dimension:** 10 x 25 cm

- With the in-wall installation the Technical Area is entered from the back for ease of use, without the need for PPE.
- Optional Product Containment System (PCS) ensures minimal operator exposure to active ingredients and helps to prevent product loss or contamination.

# SIMPLE CONTROLS
## AIDING AN AUTOMATED, REPEATABLE WORKFLOW

**Fitzpatrick's CCS Series is delivered with intuitive, easy-to-understand software powering fully automated controls, thereby removing the risk of human error.**

Each CCS Series machine comes with a set of pre-defined settings and optimized adjustments built in, all based on Fitzpatrick's 80+ years of experience and innovation in the design and manufacture of size reduction, roll compaction, and process systems.

Fitzpatrick has programmed software that includes admin / user level security clearance, ensuring lower level operators cannot change recipe-based settings or cause unexpected errors.

CCS machines perform consistently and deliver product that meets our customer's highest expectations. Product delivery is precise and results are easily repeated – mandatory for the demanding needs of today's validated workflows.

### PLC / operator interface

Allows for manual or automatic operation. Process data acquisition including batch reporting, historical trending and event logging. Simple path to validation documentation and support.

### Security of process

Multiple levels of password security allow admin and operator level secured functionality. 21 CFR part 11 solutions.

### Large HMI display

Fully instrumented touch screen with large-sized display ideally suited for cleanroom operators wearing cleanroom suits and gloves.

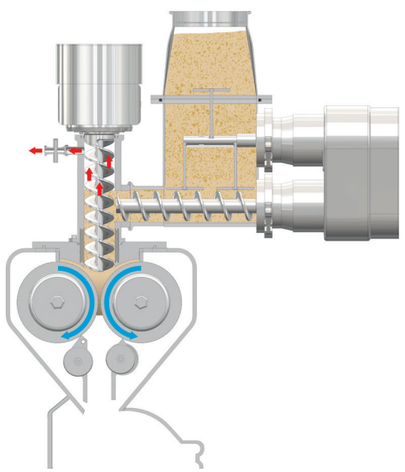
### Flexible configuration

CCS units are suitable for mounting in-wall, free-standing, portable or in an isolator / flow booth. In-wall installations minimize clean room space requirements and allow for internal maintenance access without the need for cleanroom attire.

**Technical features**

For more information on the market-leading features of the CCS range, **see page 10**.

# CLASS-LEADING
# PRODUCT DESIGN AND MANUFACTURING, BUILT TO LAST



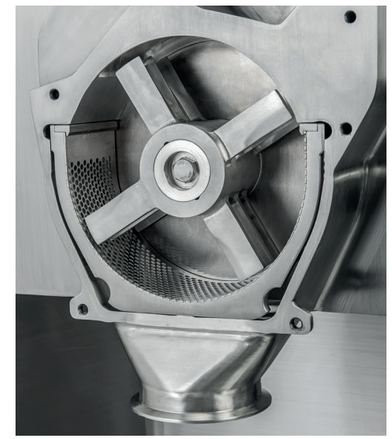
### Independently controlled two screw feed design

CCS Series machines have been designed with a dual-feed system. The horizontal feed screw meters a consistent flow of powder to the process. The high-speed vertically mounted pre-compression screw provides deaeration and pre-compression of product before it passes through the compaction stage, helping to achieve a more consistent ribbon density.

Our wide range of screens and rotor configurations in the milling step enable us to achieve the desired PSD for your specific process.

FITZPATRICK'S LONGEVITY AND UNMATCHED DIVERSE PROCESS EXPERIENCE HAS HELPED TO STEER THE DESIGN OF WORLD-CLASS PRODUCTS AND ENHANCED ENGINEERING CAPABILITIES

**Counter-Rotating Rolls** For Precise Controllable Compaction



**Knife Rotor** For "In Air" Impact of Harder Compacts

**Bar Rotor** For Slow-Speed "Shearing" of Compact

### Compaction

The powder is fed between two counter-rotating rolls and pressed, creating a dense, compact ribbon. Factors controlling the compaction process are roll surface, diameter & width, peripheral speed, roll force & gap. The hydraulic system with floating roll produces a precise force which ensures a uniform compact.

### Uniquely configurable milling options

Fitzpatrick has developed the greatest selection of rotor and screen combinations and has made them available for the CCS range. These uniquely configurable options can solve most powder conditioning requirements and achieve the tightest particle size distributions of any manufacturer.

### Test our class-leading solutions

Let us help you validate and optimize your roll compactor process. We have fully equipped lab testing centers and we have demonstration and rental units available to perform your own proof-of-concept trials or optimize your compaction process parameters.

### Optimized granulation process

The CCS Series is built to perform and last, maximizing investment and offering the longest lifespan for your production needs. Customers that adopt the CCS Series quickly realize the highest possible ROI.

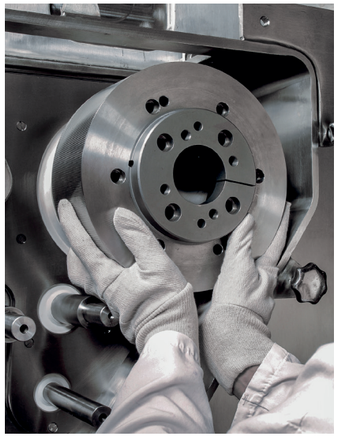
### Sealed processing area

Lastly – with operator safety being paramount – the CCS Series ensures the highest levels of product containment, decreasing risk of occupational exposure to active ingredients as part of your production process.

# IMPROVED PROFITABILITY
# WITH MINIMAL MAINTENANCE AND REDUCED DOWNTIME

**Our technical support group provides:**

- **Consultation and optimization of your processing workflow**
- **Regulatory validation assistance and support**
- **Operational and maintenance training of your personnel**



**Fitzpatrick's CCS Series has been designed with the user in mind. Equipment is simple to maintain with fewer parts to remove during cleaning cycles, maximizing up-time. Also, with very few wear parts, regular maintenance is fast and simple.**

**Benefits of cGMP design**

- Potentially increase batches per shift by 50% with fewer parts to handle during product changeovers.
- Cleaning mode automatically spreads rolls apart for faster, safer and easier roll access.
- Save time and labor costs with reduced number of steps and component adjustment.
- Optional Wash-In-Place (WIP) and automated cleaning cycle reduces downtime.

CLEANING MODE AUTOMATICALLY SPREADS ROLLS APART FOR FASTER, SAFER AND EASIER ROLL ACCESS

**Improve safety and access with through-wall installation**

CCS through-wall installations allow for internal maintenance access without the need for cleanroom attire to enter potentially hazardous cleanroom environments.

**Unrivalled support**

If you need help, Fitzpatrick employs a global network of support personnel.

Our Application Engineers can assist you with product testing and laboratory analysis, and can help select the correct equipment for your application. Engineers can also provide shoulder-to-shoulder support during your production scale-up.

# TECHNICAL DATA

**Safety**

Configurable installations: In-wall, free-standing, portable or in an isolator / flow booth.

Interlocked safety switches maximize operator safety.

**Product Containment**

1 µg/m³ capability with patented Product Containment System (PCS).

Sealed technical area: double lip seal ensures containment when primary seal is removed for cleaning.

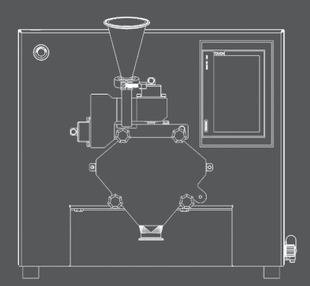
The CCS Series is designed to fully contain all product in the processing and receiving sections of the machine. This tightly sealed design allows for the optional PCS to be added at the discharge. The PCS draws a slight vacuum in the process environment to provide maximum containment.

Optional <1 µg/m³ through glovebox design.

**Accreditations**

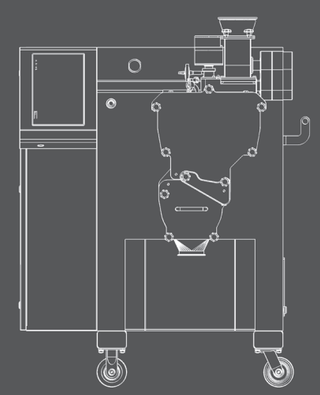
## LCS

| | | |
|---|---|---|
| **Roll Force** | kN/cm | 20 |
| **Roll Dimension** | cm | 1.5 x 12 |
| **Roll Gap** | mm | 0.4 - 2.6 |
| **Capacity** | kg/hr | 6 |
| **Dimensions** | W x D x H mm | 690 x 668 x 641 |
| **Weight** | kg | 159 |
| **Noise** | dB | <75 |
| **Power** | kW | 1.2 |



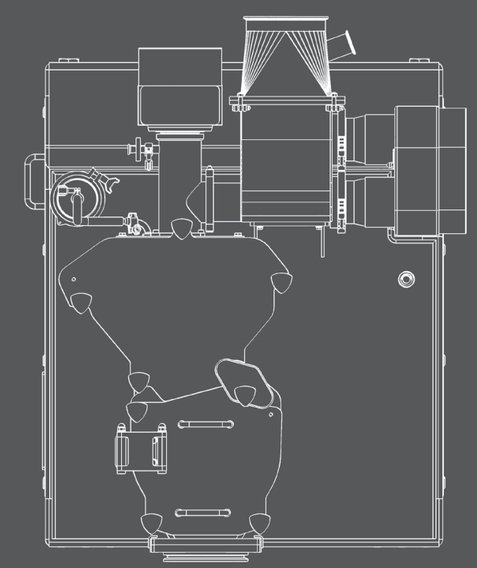
## CCS **220** / **320**

| | | |
|---|---|---|
| **Roll Force** | kN/cm | **220:** 26<br>**320:** 17 |
| **Roll Dimension** | cm | **220:** 2 x 20<br>**320:** 3 x 20 |
| **Roll Gap** | mm | 1 - 6 |
| **Capacity** | kg/hr<br>kg/hr | **220:** up to 25*<br>**320:** up to 75* |
| **Dimensions** | W x D x H mm | 1245 x 940 x 1600 |
| **Weight** | kg | 861 |
| **Noise** | dB | <75 |
| **Power** | kW (HP) | 2.7 (4) |



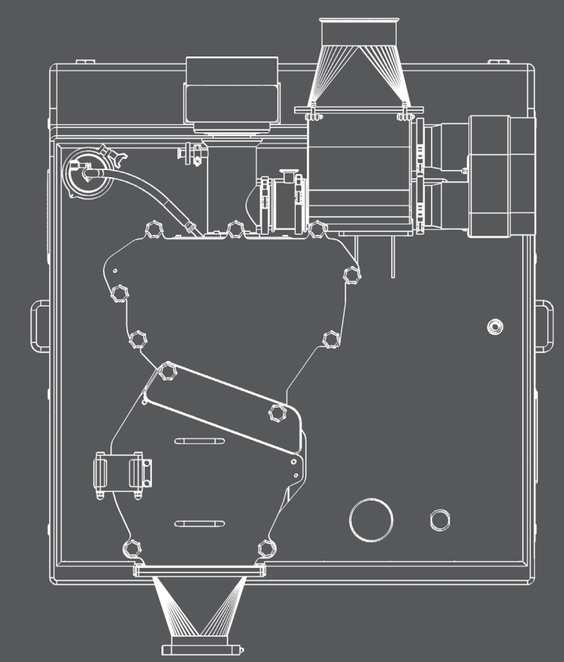
## CCS **520** / **720**

| | | |
|---|---|---|
| **Roll Force** | kN/cm | **520:** 26<br>**720:** 17 |
| **Roll Dimension** | cm | **520:** 5 x 20<br>**720:** 7.5 x 20 |
| **Roll Gap** | mm | 1 - 6 |
| **Capacity** | kg/hr<br>kg/hr | **520:** up to 150*<br>**720:** up to 250* |
| **Dimensions** | W x D x H mm | 1145 x 1830 x 1425 |
| **Weight** | kg | 2268 |
| **Noise** | dB | <75 |
| **Power** | kW (HP) | 8.8 (12) |



## CCS **1025**

| | | |
|---|---|---|
| **Roll Force** | kN/cm | 20 |
| **Roll Dimension** | cm | 10 x 25 |
| **Roll Gap** | mm | 1 - 6 |
| **Capacity** | kg/hr | up to 400* |
| **Dimensions** | W x D x H mm | 1445 x 2030 x 1800 |
| **Weight** | kg | 3855 |
| **Noise** | dB | <75 |
| **Power** | kW (HP) | 16.8 (22.5) |



# FITZPATRICK
## WORLD-LEADING EXPERTISE AND SUPPORT

**At Fitzpatrick we are committed to improving the performance and profitability of our customer's powder processing operations.**

Our customers are supported by world-leading applications and development experts, and we continually invest in customer-driven innovative solutions to address market needs.

We are committed to offering long-term support services through a highly-technical customer service and spare parts network team.

Discover and experience the Fitzpatrick difference!

- **Headquarters**
- IDEX MPT Centers of Excellence

Representation in over 80 countries worldwide

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