# Sustainability in commercial laundering processes

Module 2
**Machine technology**

Chapter 2

## Washer extractors

## Table of Contents:

# Learning targets

Education and Culture
Leonardo da Vinci

After finishing the module you will

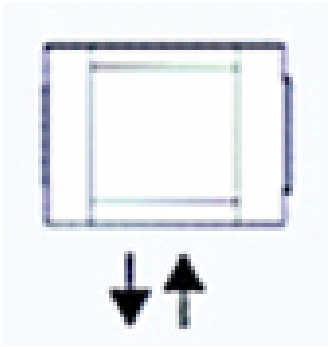
- be able to distinguish washer extractors in barrier wall and non barrier wall execution.
- know different loading and unloading possiblities of washer extractors.
- be able to distinguish different inner drum divisions.
- know the possibilities of manual and external chemical dosing.
- know the advantages of automatic weighing systems.

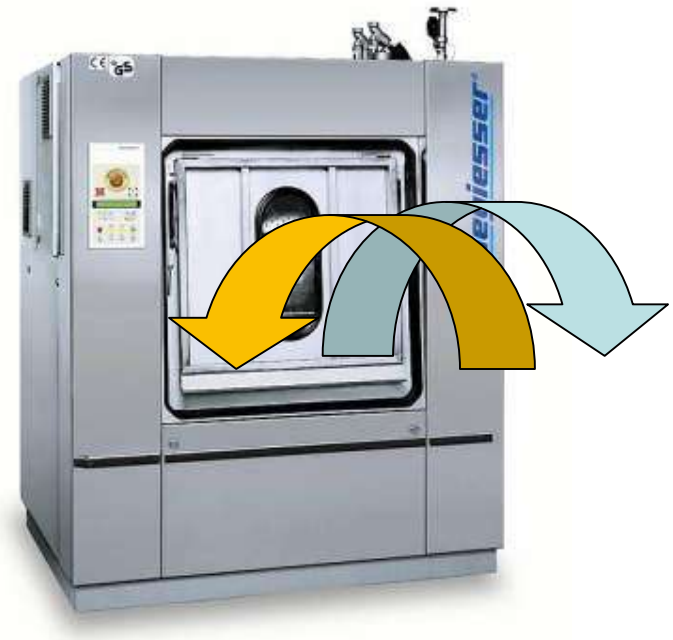
## Washer Extractors – Loading / Unloading

Example: Kannegiesser Favorit

- Manual Loading and Unloading
- Side loading

- **N**on **B**arrier **W**all execution



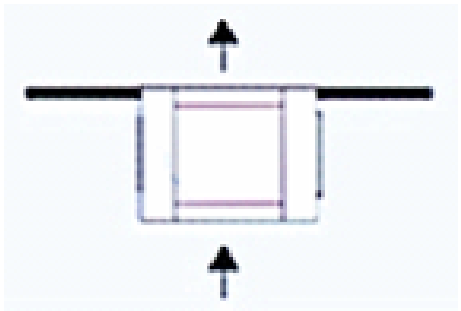


## Washer Extractors – Loading / Unloading

Example: Kannegiesser Favorit


- Manual Loading and Unloading
- Side loading

- **B**arrier **W**all execution
- Pass through



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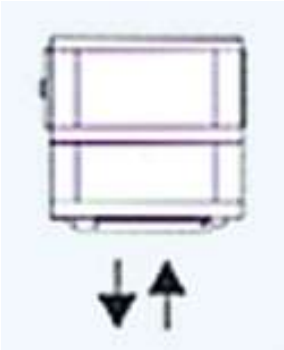
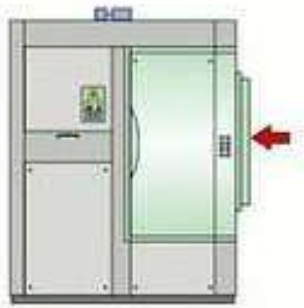
## Washer Extractors – Loading / Unloading

Example: Kannegiesser Futura

- **N**on **B**arrier **W**all execution
- Front loading

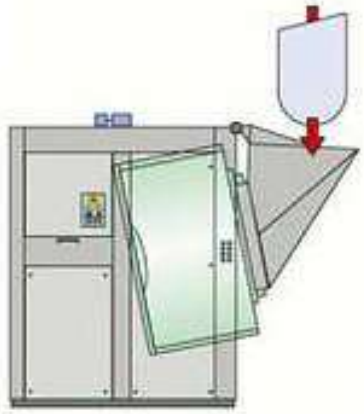


- Manual Loading and Unloading *or*
- Automatic Loading and Unloading



Manual loading

Automatic tilt unloading

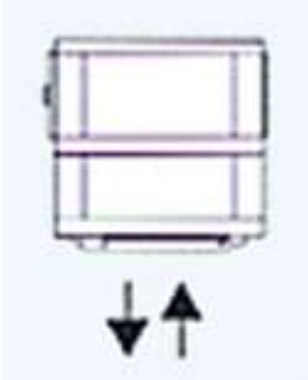


Automatic top loading

Automatic tilt unloading

## Washer Extractors – Loading / Unloading

Example: Kannegiesser Futura



- Examples for **N**on **B**arrier **W**all execution

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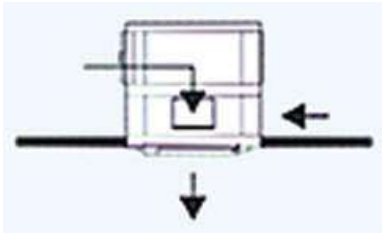
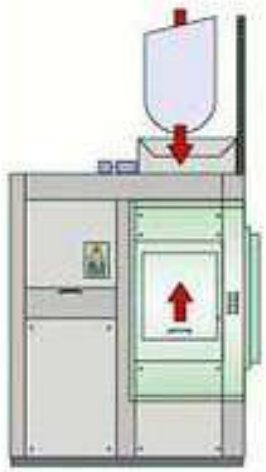
## Washer Extractors – Loading / Unloading

Example: Kannegiesser Futura

- **B**arrier **W**all execution
- Top or side loading

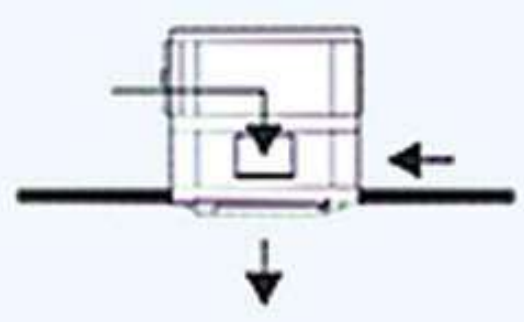




- Manual Loading and Unloading *or*
- Automatic Loading and Unloading

## Washer Extractors – Loading / Unloading

Example: Kannegiesser Futura



- Examples for **B**arrier **W**all execution

# Washer Extractors - Versions of Doors

## Example: Kannegiesser Favorit


Inner Drum:

- Big and divided inner drum door
- Lock and unlock **without a tool**
- Alternative design **with tool**, special for disabled people
- Lower part of the door is used as a bridge

Outer Drum:

- Flap opens to the top

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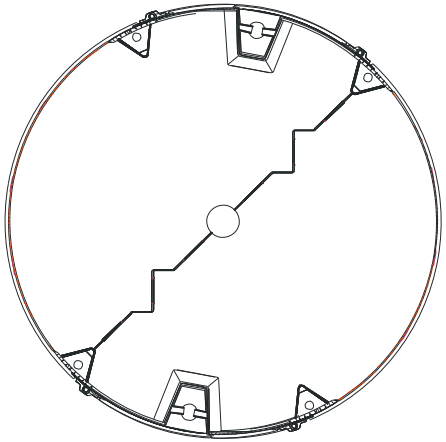
## Washer Extractors - Versions of Doors

Example: Kannegiesser Favorit

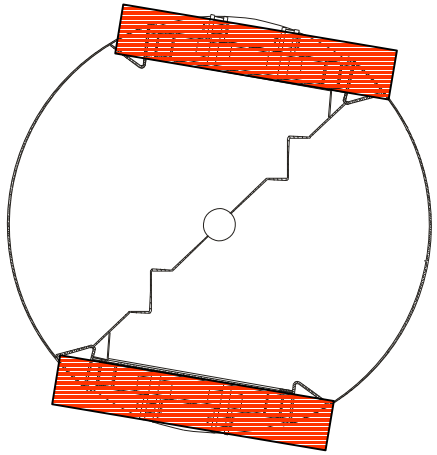
Design alternatives:

- Left or right hand hinged door
- Available for inner drum and for outer drum
- Tool is required to lock and unlock the door

## Washer Extractors - Versions of Doors



Full cylinder volume



Reduced cylinder volume
due to hinged doors

- Hinged inner doors reduce the inner drum volume!

# Washer Extractors - Versions of Doors

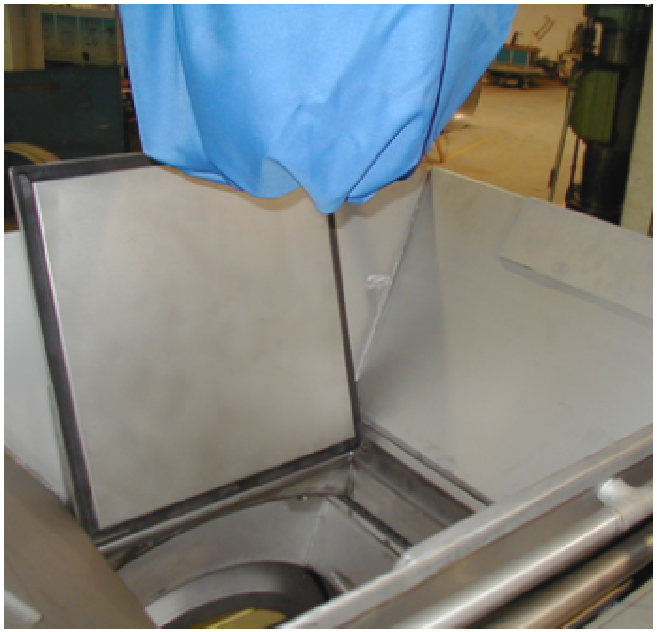
Example: Kannegiesser Futura

Front door:

- Left or right hand hinged door
- Manual or automatic lock and unlock of the door
- No tool is required

# Washer Extractors - Versions of Doors

Example: Kannegiesser Futura



Top Flap:

- Automatic function for bag or conveyor belt loading
- Automatic positioning, open and close of the inner drum door

# Washer Extractors - Versions of Doors

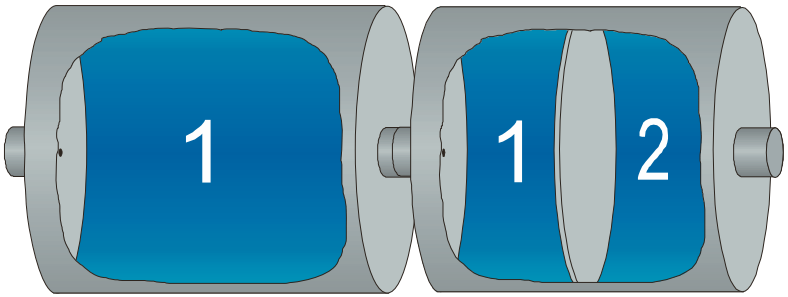
## Example: Kannegiesser Futura

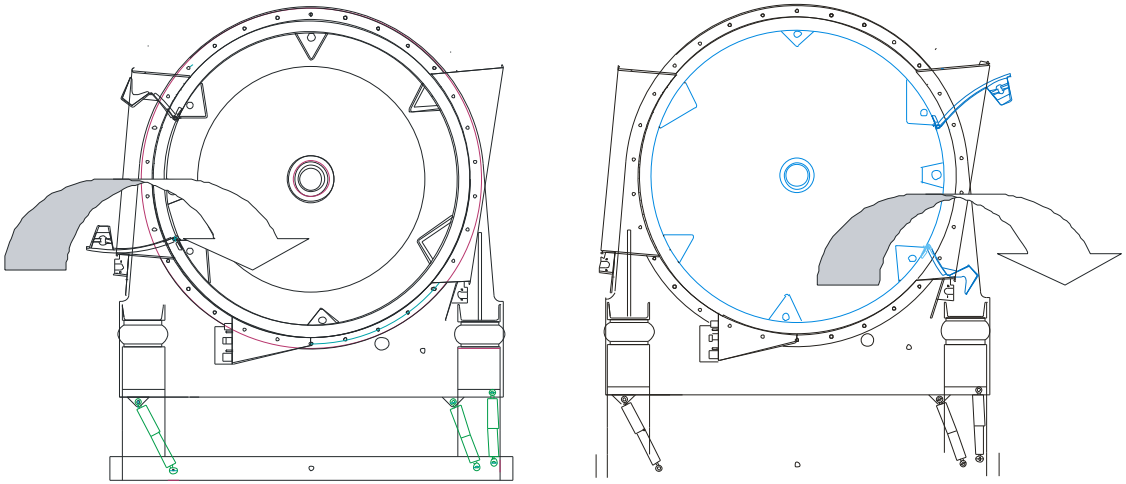
Side Door (Left or right):

- Hinged door of the outer drum
- Manual lock and unlock of the door
- Flap of the machine housing opens to the top
- Automatic positioning, open and close of the inner drum door

## Washer Extractors – Drum Design

### Open Pocket
Side Loading

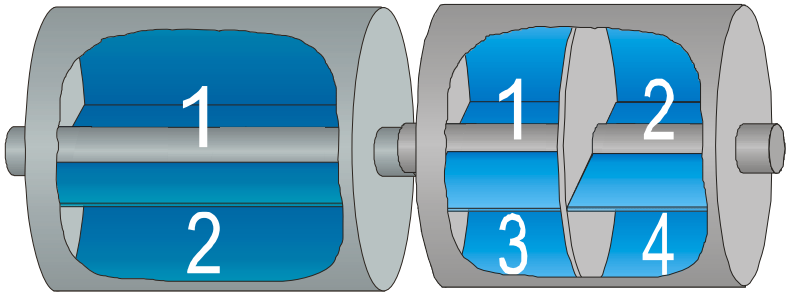


## Washer Extractors – Drum Design

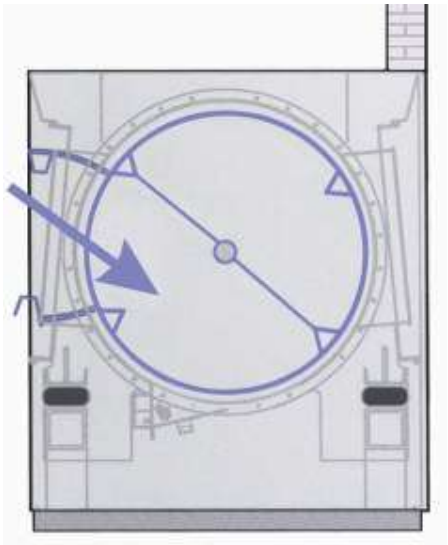
### Open Pocket
Front Loading

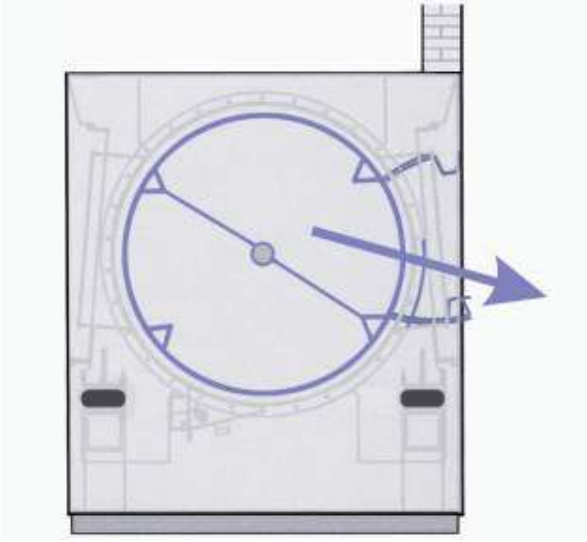
## Washer Extractors – Drum Design




### Pullman Division
(also known as D-Division)

**B**arrier **W**all Execution





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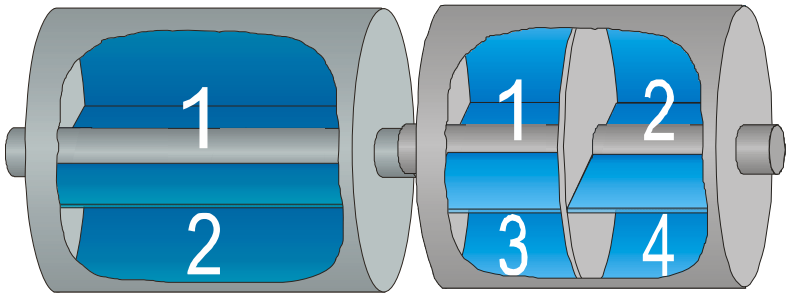
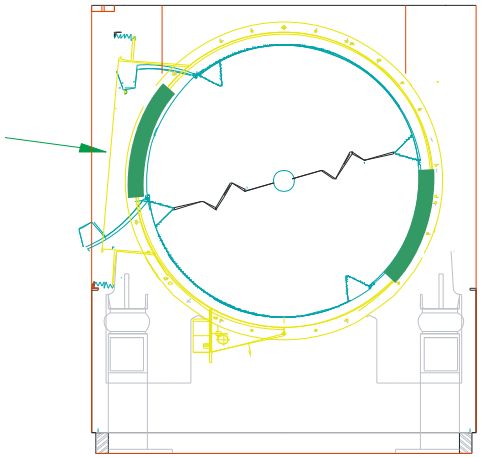
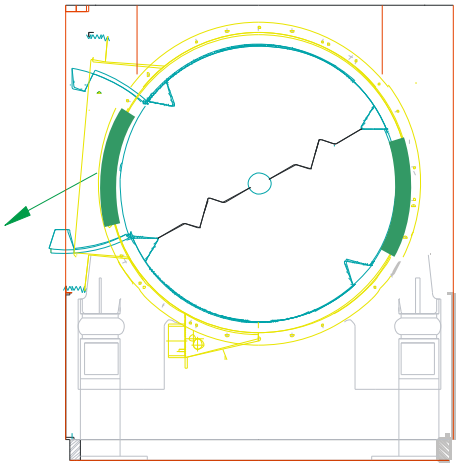
## Washer Extractors – Drum Design




### Pullman Division
(also known as D-Division)

**N**on **B**arrier **W**all Execution





Inner drum diameter < 1650 mm with one door per chamber

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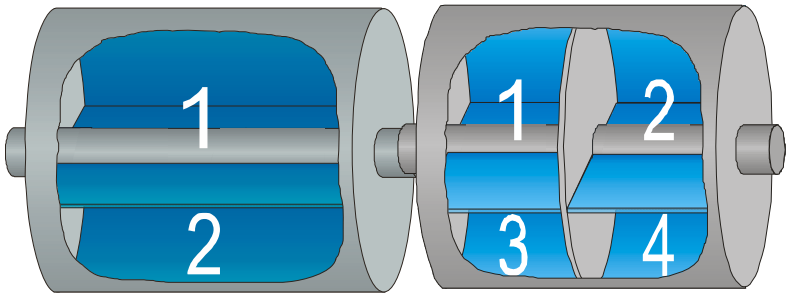
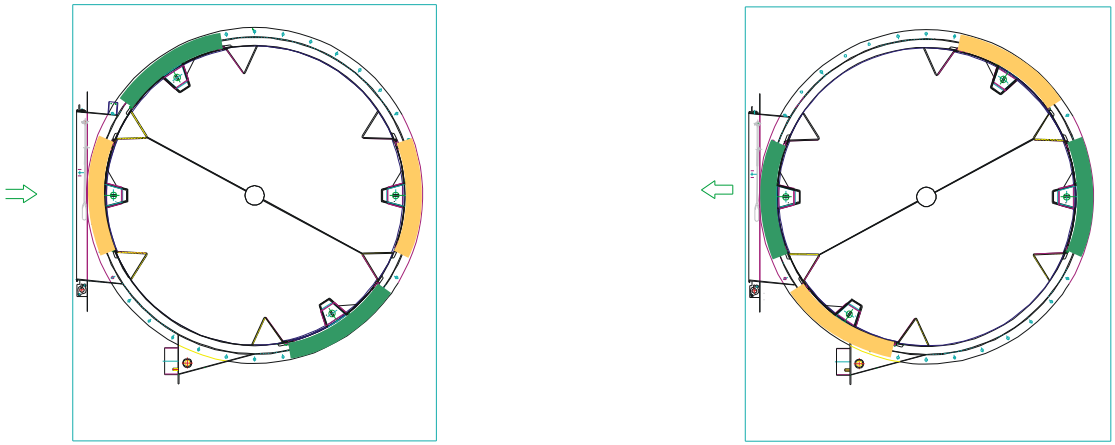
## Washer Extractors – Drum Design

### Pullman Division
(also known as D-Division)

**N**on **B**arrier **W**all Execution



Drum diameter ≥ 1650 mm with two doors per chamber

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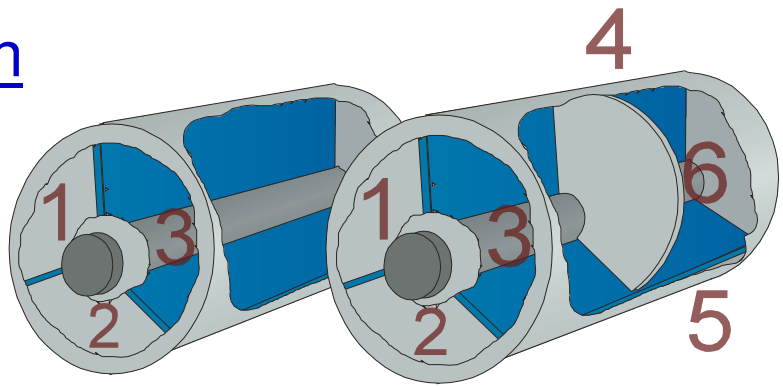
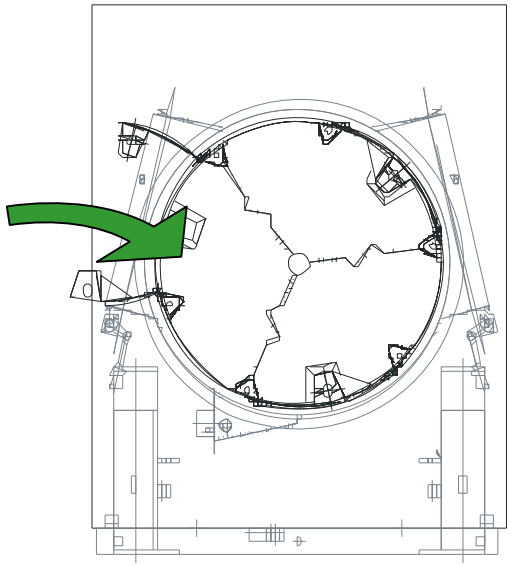
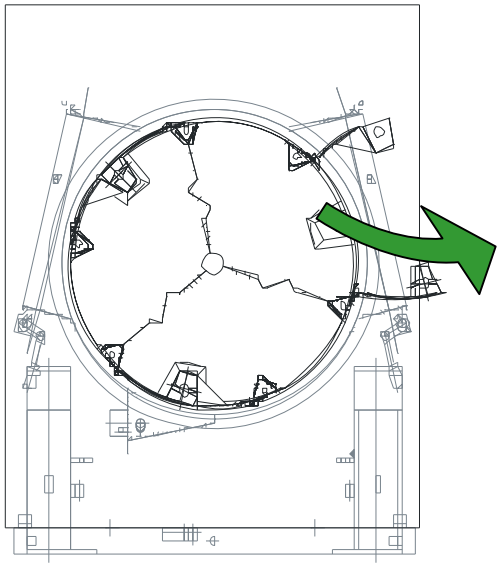
## Washer Extractors – Drum Design

### Y-Division





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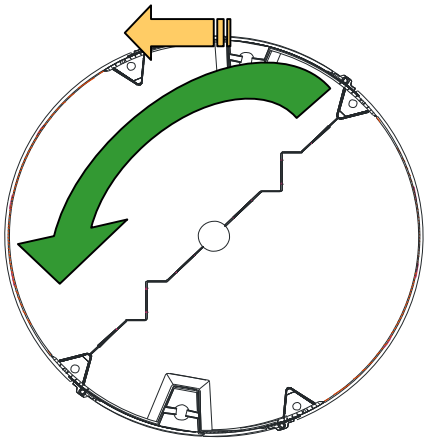
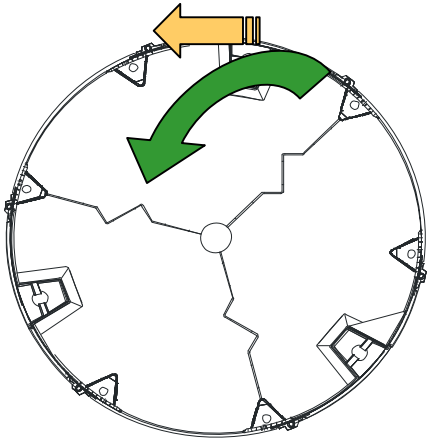
## Washer Extractors – Drum Design

**Wash speed ~ 0.9 g**



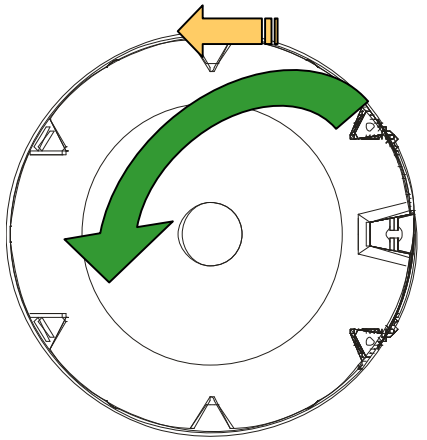
Pullman-Division

++ Friction
++ Compression
++ Flow through



Y-Division

+ Friction
+ Compression
+ Flow through



Open pocket

++ Friction
++ Compression
++ Flow through

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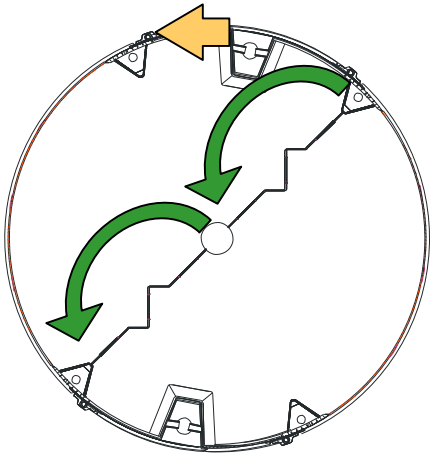
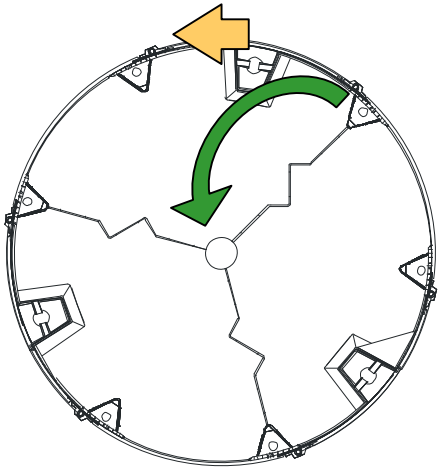
## Washer Extractors – Drum Design

**Wash speed ~ 0.4 g**



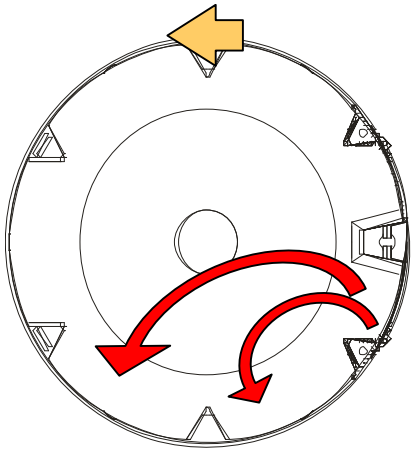
### Pullman-Division

\+ Friction
\+ Compression
\+ Flow through



### Y-Division

+- Friction
+- Compression
+- Flow through



### Open pocket

\- Friction
\- Compression
\- Flow through

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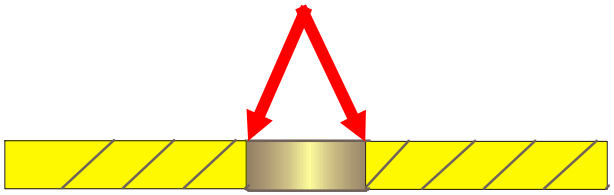
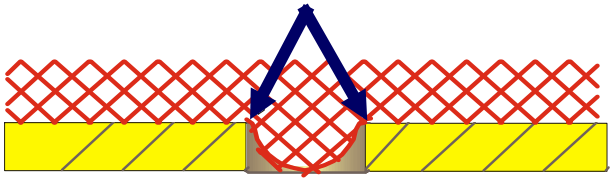
# Washer Extractors – Drum Design

**Conventional** cylinder perforation



**Washing**

- rough edges cause permanent friction of fibres, resulting in a higher loss in tensile strength
- increased lint formation



**Extraction**

- the work is firmly pressed into the cylindrical drum perforation

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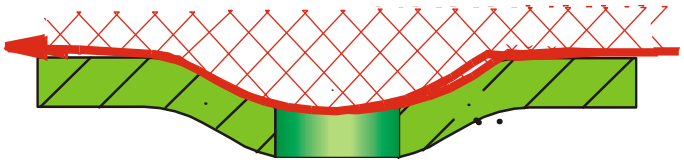
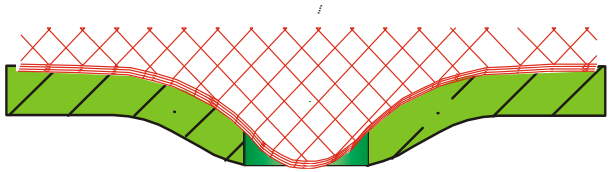
## Washer Extractors – Drum Design

**CAREWASH** funnel perforation



**Washing**

- perfectly smooth thus guaranteeing a very gentle washing action
- less loss of fibres



**Extraction**

- Considerably reduced stretching of the fibres

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## Washer Extractors – Drum Design

### Pullman Division
(also known as D-Division)

### Y-Division

Partition wall:

- Perforatet plate for good flow through
- Rib design to increase mechanical action

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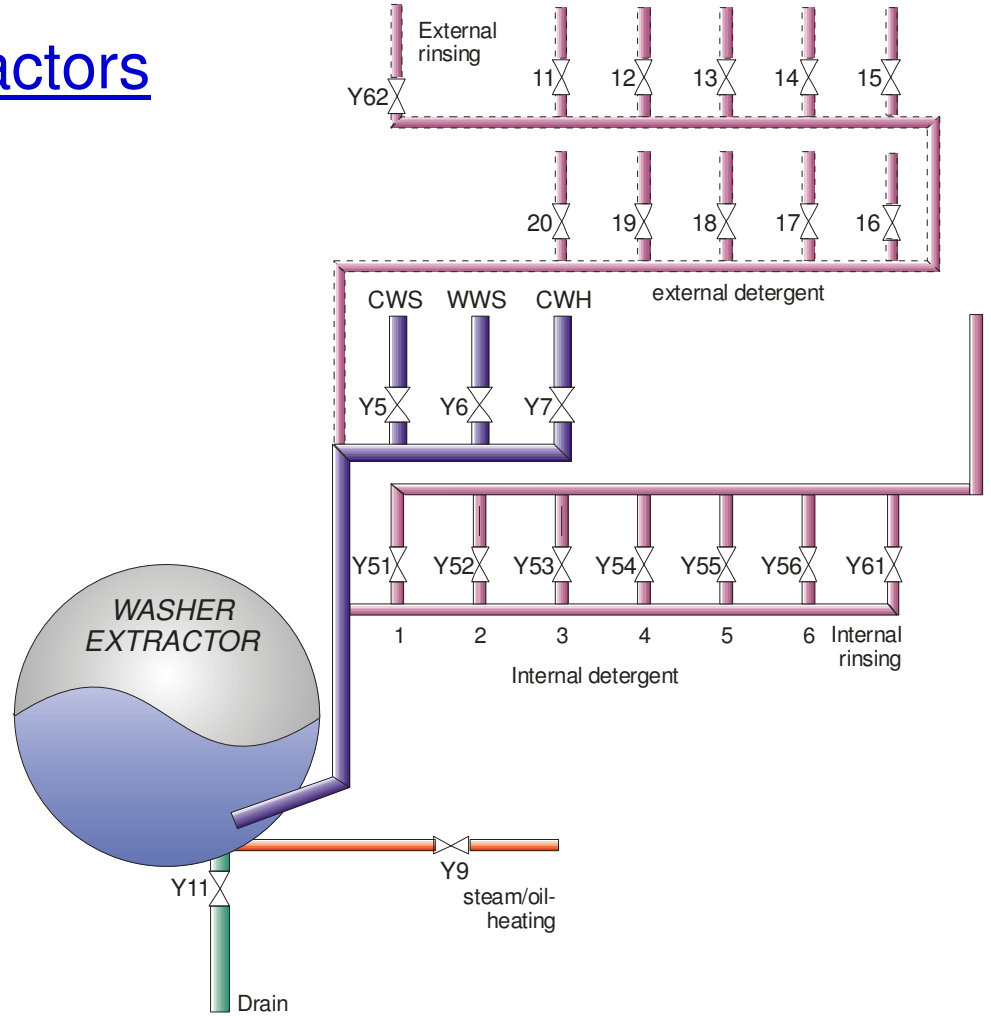
## Water flow in washer extractors

### Basic layout:

- Connections for **C**old **W**ater **S**oft, **W**arm **W**ater **S**oft and **C**old **W**ater **H**ard
- Possibility to mix cold and warm water
- Internal detergent boxes with flushing
- External detergent connections with flushing
- Inlet of water and chemicals below the water level



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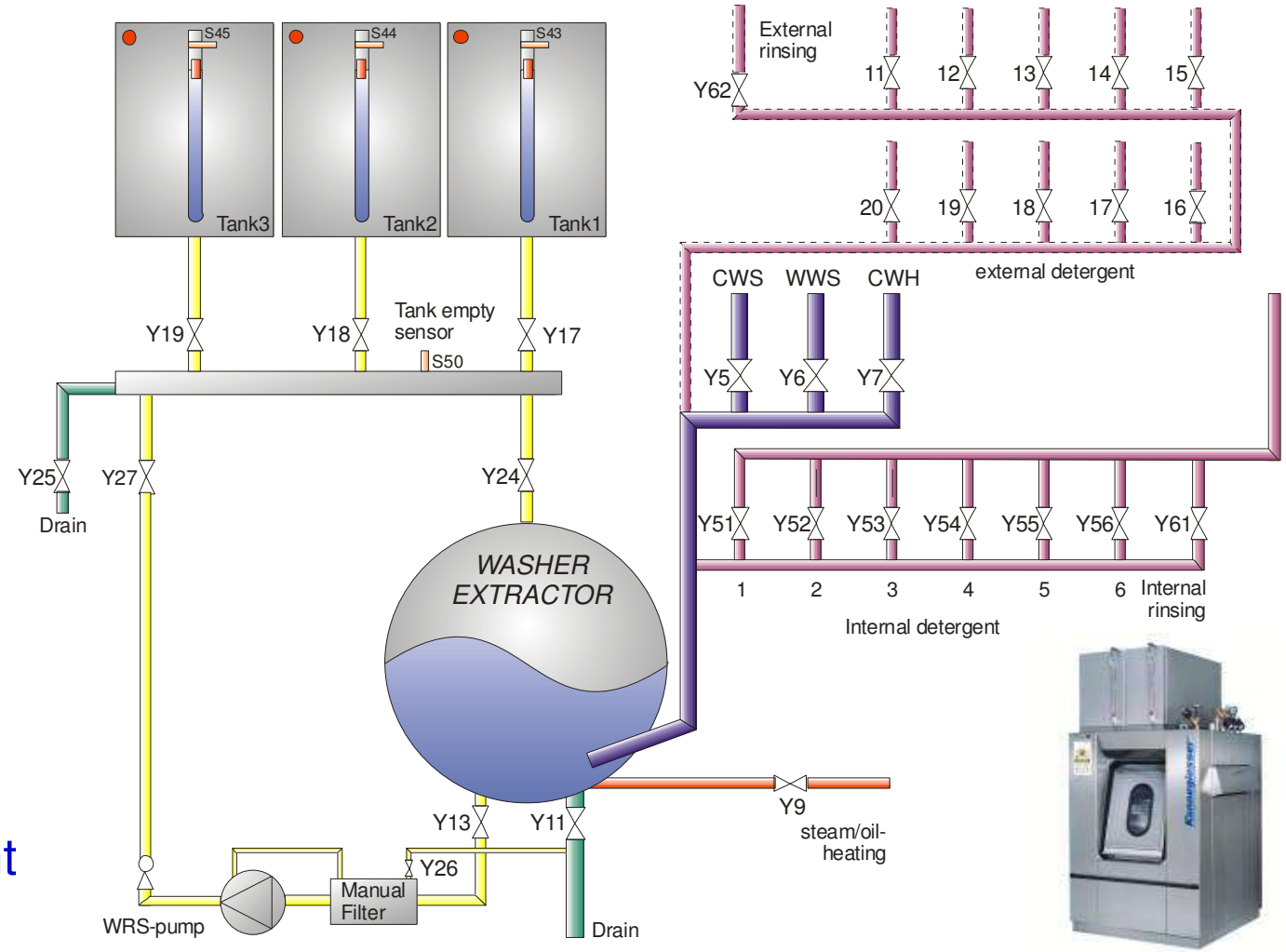
# Water flow

## Water recovery:

- Recovery of wash water for following processes
- Recovery tanks on top or beneath the washer
- Reduction of water, steam and detergent consumption



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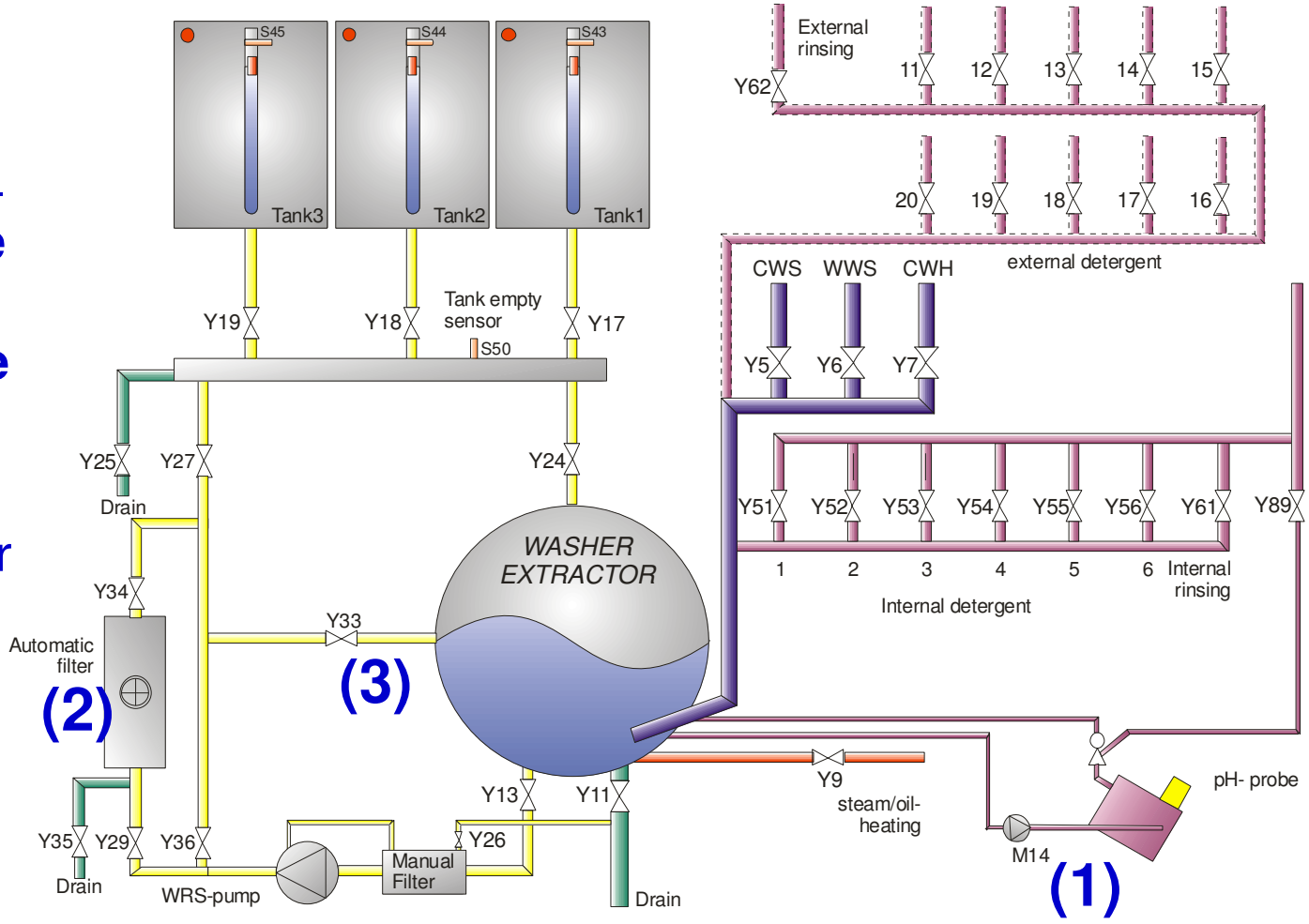
# Water flow

## Additionals (e.g.):

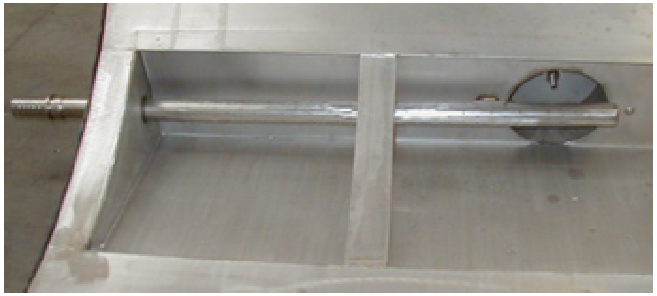
(1) Controlling the neutralization with **pH-probe**

(2) Automatic **lint filter** for recovery water

(3) "Low Dip" **recirculation system** for reduced level of washing liquid



## Washer Extractors – Heating Systems



**Direct Steam** Injection

Stainless steel piping for **Indirect Heating** with hot water, thermo oil or steam

Heating rods for **Electrical Heating**

## Washer Extractors – Heating Systems

**Standard:**
Steam Valve 4 - 8 bar

**Alternative:**
High pressure 8 - 12 bar
or bigger size for low pressure 0.5 - 4 bar

**Also possible:**
2 different heating sytems in one machine:

- Direct Steam for normal wash
- Indirect Steam for Wet Cleaning

## Washer Extractors – Waste Water Connections

**Standard:**

- 1 normal closed drain valve

**Options:**

- 2nd drain valve
- Waste water pump

**Further option:**

- Coarse filter and pump for Water Recovery Sytem

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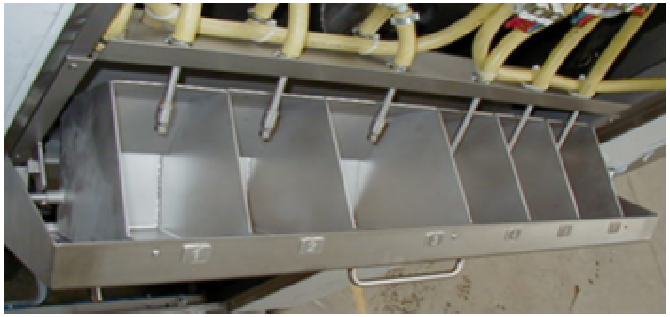
# Washer Extractors – Chemical Supply

## Manual Dosing

- Single hopper on the outer drum



- Internal dosing boxes made of 316L (V4A) for powder and liquid products

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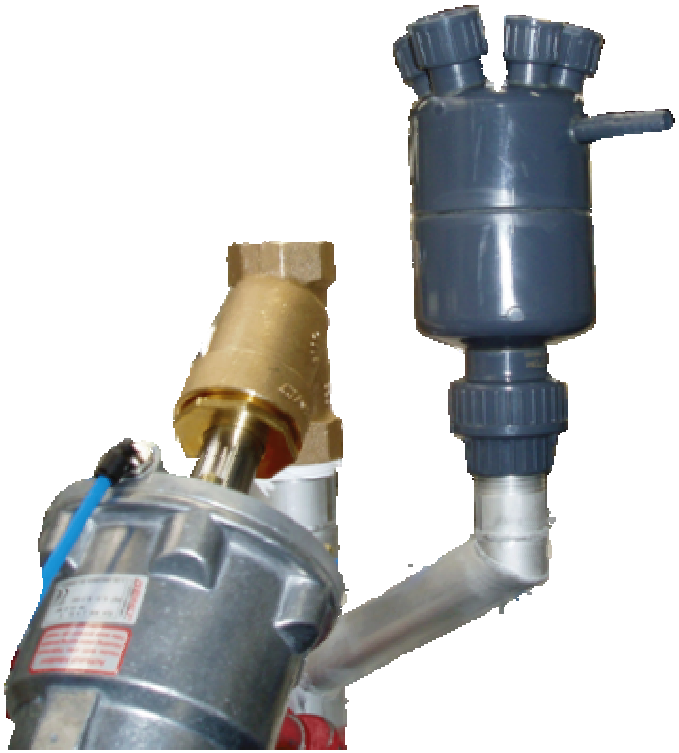
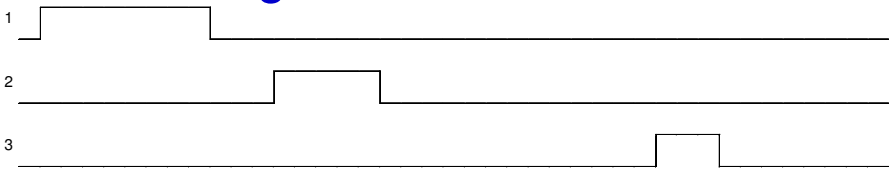
# Washer Extractors – Chemical Supply

## External Dosing

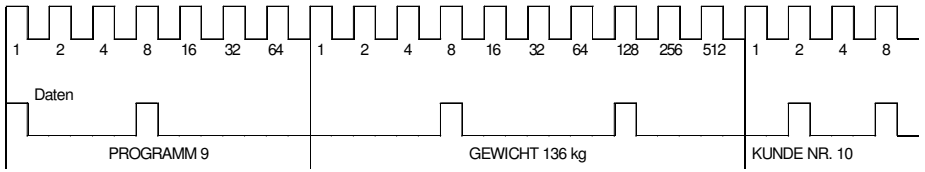


- 6 Connections with ½“ and ¾“
- Fresh water rinse from machine
- Pump control via potential free contacts:

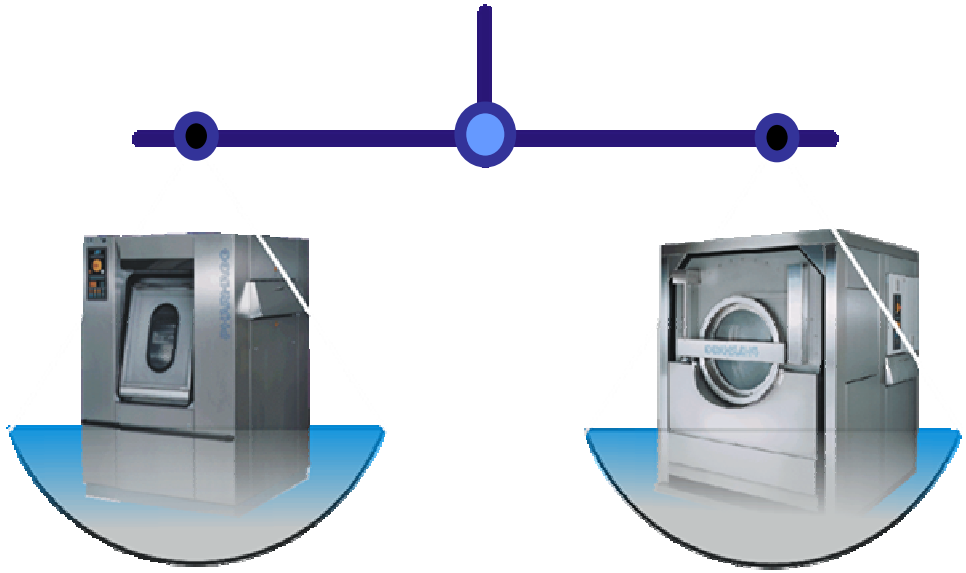
➢ Time signal




➢ Data code



## Washer Extractors – Weighing system



Built-in electronic weighing scales for washer extractors

Example: Kannegiesser SCALETRON

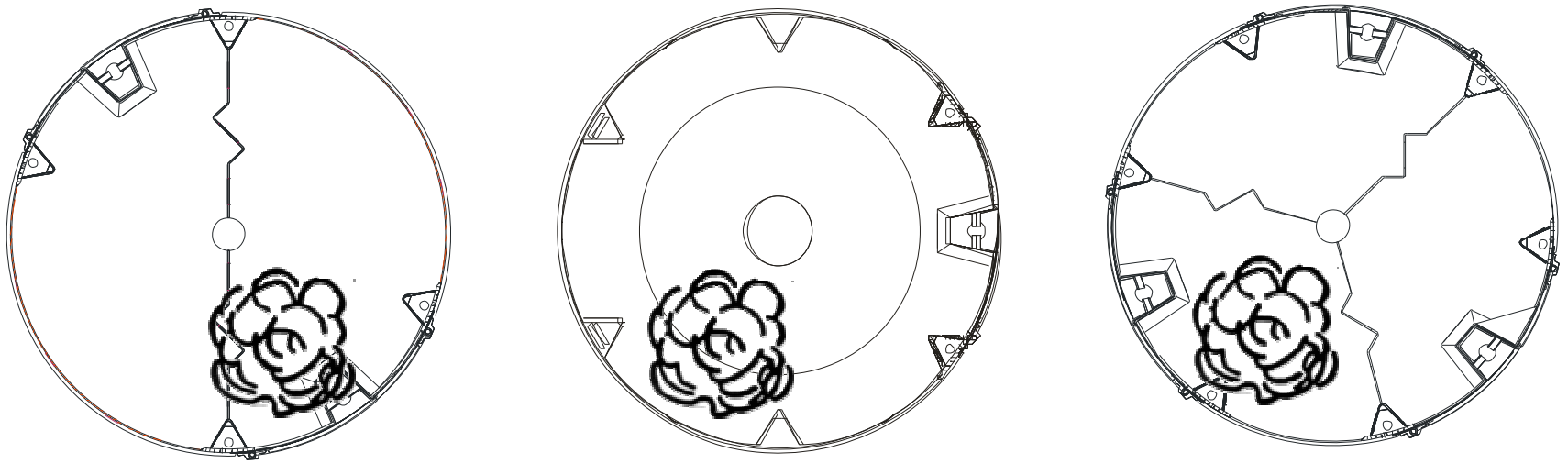
## Washer Extractors – Weighing system SCALETRON


Features:

- Less labour - batch weighing and loading is **one operation**
- Setting of **right water level** in ratio to the load
- Setting of **right dosing** depending to water level
- Programmable **minimum and maximum limits**
- Data transfer to management **Data Logging**

# Washer Extractors – Weighing system SCALETRON

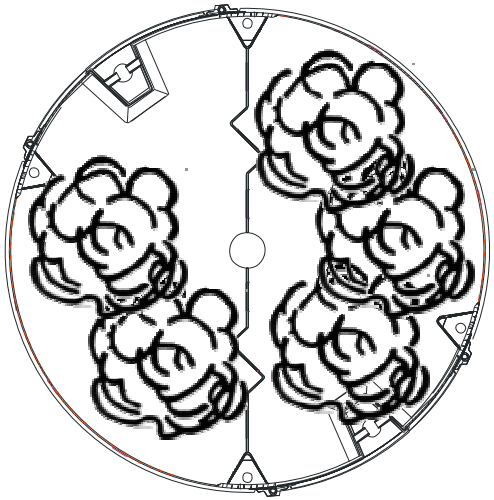
Example: Maximum inbalance for washer extractor type "Favorit" equals 10% of nominal weight (1:10)

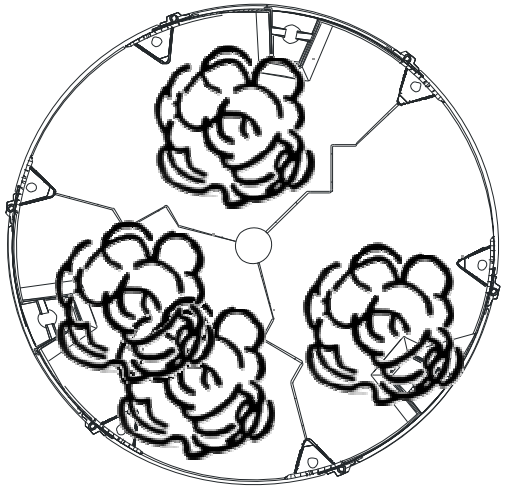


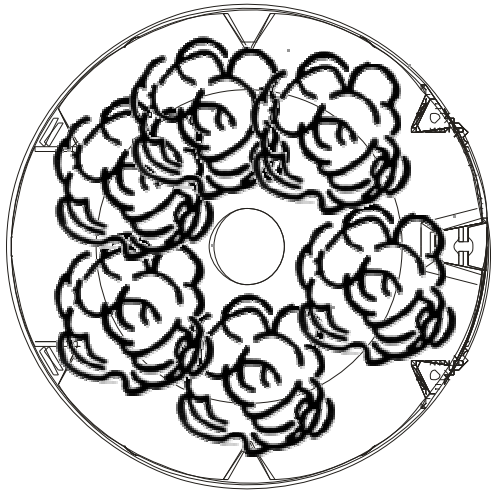
Weighing during loading helps avoiding inbalances!

## Washer Extractors – Weighing system SCALETRON

- Optimum loading to avoid inbalances equals **60-100%** of nominal load **for Open Pocket drums** and **0-100% / n** for **divided drums** (with n = number of compartments)







Weighing during loading helps avoiding inbalances!