

## HAMO T-BCC Automated Washing & Drying System for IBCs, Drums, Pallets







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#### **UsableChamber dimension:**

1500x1500x2100 mm

#### 1250x1250x2000 mm

1000x1000x2000 mm

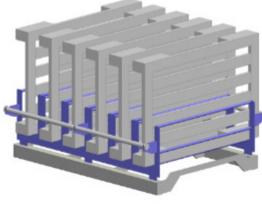
Examples of goods to be washed in the Hamo T-BCC

• IBC's 550L / 1,160L / 2,100L

- Drums 60L 200L
- Aluminum pallets
- Plastic buckets
- Machine parts and accessories

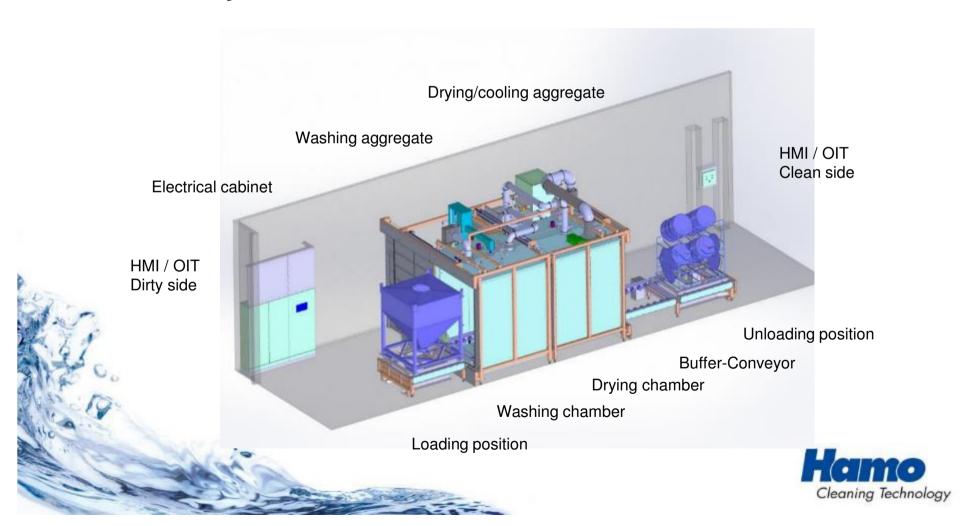




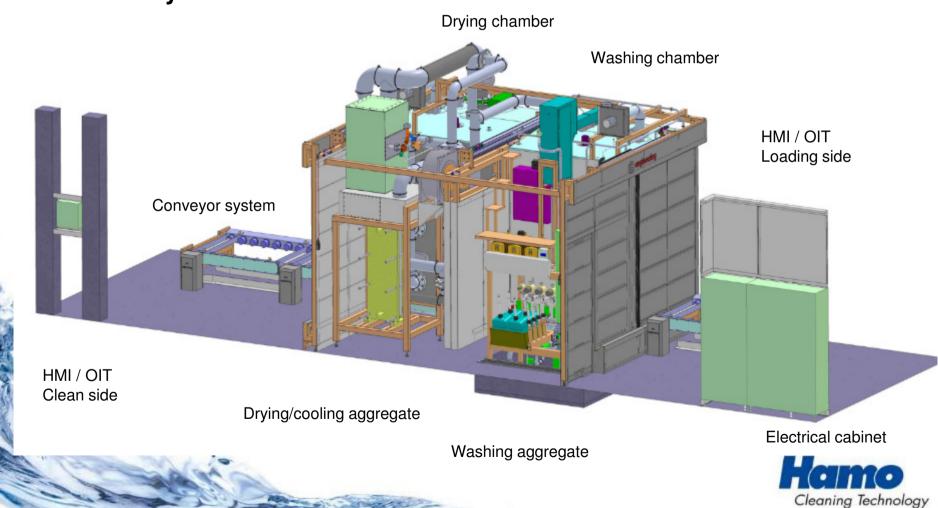




### **Machine lay-out**



### **Assembly of machine**



#### Two chamber system

- Three automated sliding doors and inflatable door seals
- Doors with reciprocal interlock
- Chambers completely welded
- Circulation tank with automated filling
   and overfill control
- Wetted parts of 316L & FDA/cGMP compliant





#### **Conveyor system**

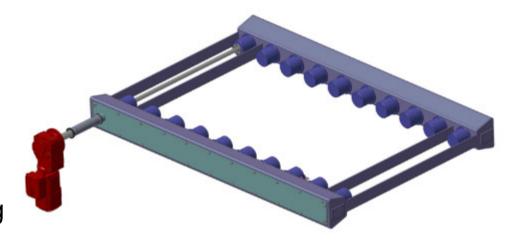
- Roller conveyor on dirty side with skirting and loading device
- Roller conveyor inside washing & drying chamber
- Roller conveyor on clean side with skirting and unloading device
- Load & unload height 500 mm
- Wetted parts of 316L

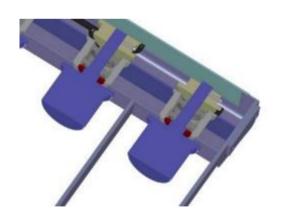




#### Roller conveyor design

- cGMP design
- Wetted parts of 316L
- Housing completely welded, machined and polished
- Each axel mounted in housing with two roller bearings and special radial seal (H-Ecopur)
- Each wheel driven by chain
- Driveshaft connecting left and right side of roller conveyor
- Drive motor is connected to the driveshaft outside the chamber







## **PLC** control system

- Controlled by Siemens S7-315
- Profibus DP, Ethernet interface
- Operator panel MP 377
   WinCC flexible
- Complies with CFR21 part 11
- Modem
- Printer
- Scada documentation system is optional





#### **Process**

- Cycle time: Approx. 15 to 20 minutes with cooling to 50°C. 30 minutes when cooling down to 25°C
- Water consumption approx. 600–800 L/cycle
- 4-phase washing process
  - Prewash with cold or hot tap water, drained not circulated
  - Main wash with circulated hot tap water, with or without detergent
  - Rinsing with hot tap water, drained not circulated
  - Final rinse with pure water, drained not circulated
  - Drying with circulated air 80°C
  - Cool down with supply air





### Washing system for IBC

- Automated washing lance for interior cleaning of IBC
- Self-rotating wash head for outlet flap cleaning of IBC
- Washing system for circulation pit cleaning
- Washing system for exterior cleaning of IBC and drums
- Self cleaning chamber







### **Automation washing chamber**

- Opening device for powder collection
- Self-rotating wash head for cleaning of outlet flap of IBC
- Washing system for circulation pit

cleaning









### Washing system for drums

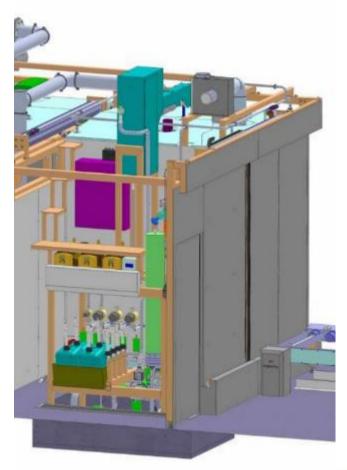
- 4 self-rotating wash heads for interior cleaning of drums
- Washing system for circulation pit cleaning
- Washing system for exterior cleaning of drums as well chamber self-cleaning





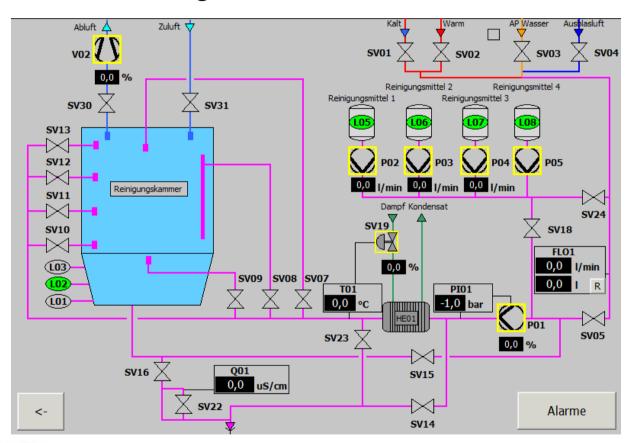
#### **Technical aggregate for washing**

- Automated vertical moving washing lance for interior cleaning of IBC
- Installation of hygienic circulation pump, shell & tube heat exchanger, out blowing, drying and draining of piping
- 3 digital detergent dosing systems
- 1 manual detergent dosing system for chamber self cleaning
- Conductivity control for final rinse
- Fan for exhaust air





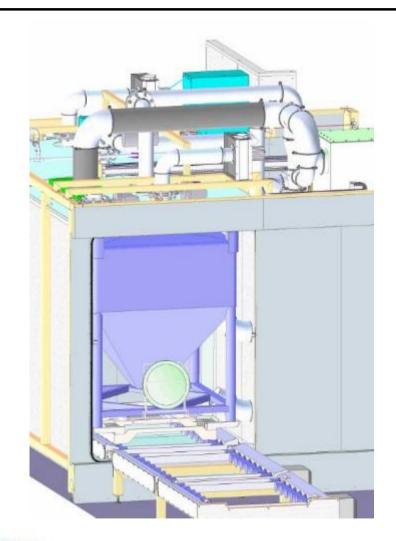
#### **Operational Menu: Washing chamber**





### **Drying system for IBC**

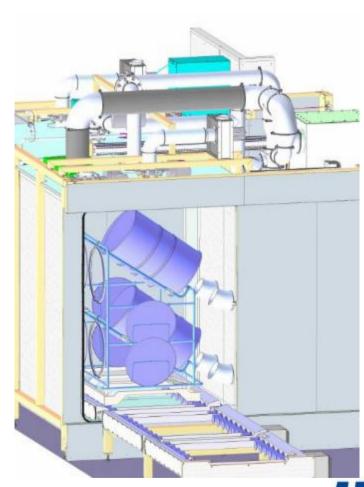
- Drying lance for IBC interior drying
- Installation with radial blower for circulating drying air and supply air for cooling





### **Drying system for drums**

- 4 blowing tubes for drying of drum interior
- Installation with radial blower for circulating drying air and supply air for cooling





#### **Drying chamber**

- Chamber self-cleaning system
- Draining system
- Drying lance for IBC interior drying
- 4 blowing tubes for drum interior drying
- Flap for circulation air
- Flap for exhaust cooling air
  - Flap for exhaust air



















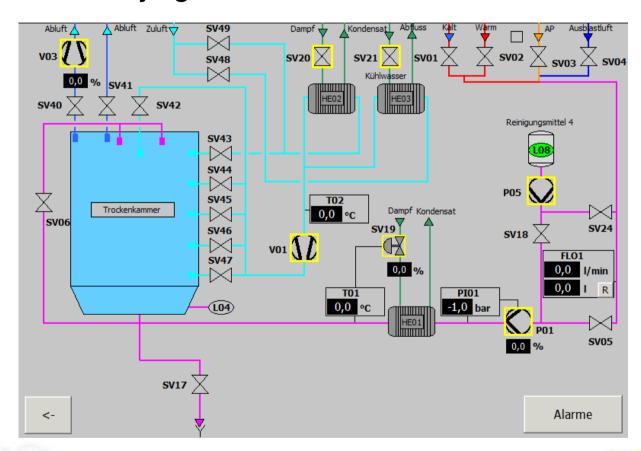
### **Technical aggregate for drying**

- Installation with radial blower for circulating drying air and supplying air for cooling
- Drying aggregate with lamellar heat exchanger
- Cooling aggregate with plate heat exchanger
- Supply air filter F9 / H13
  Fan for exhaust air



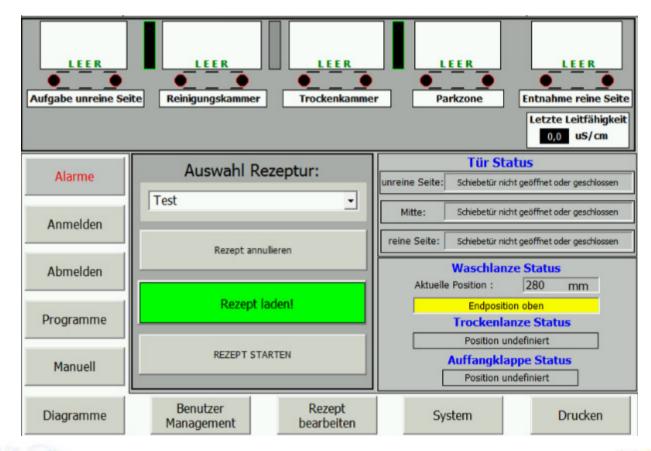


#### **Operational Menu: Drying chamber**





#### **Operational Menu: Main menu**





### **Operational Menu: User management**

Benutzer	Kennwort	Gruppe	Abmelde
Admin	*****	Administrator	0
Administrator	*****	Administrator	0
Bediener	*****	Bediener	0
Meister	*****	Supervisor	0
PLC User	*****	Unberechtigt	5
Service	*****	Wartung	0



### **Operational Menu: Recipe (cleaning program)**

Rezepturname:	Nr.:			
	<b></b>			
Eintragsname	Wert ^			
Objekt:	Container			
Rezept ID	1			
Vorreinigungszeit (sek)	0			
Druck Vorreinigung (bar)	0,0			
Temperatur Vorreinigung (°C)	0,0			
Zeitdauer Reinigungszyklus innen (sek)	0			
benutztes Reinigungsmittel:	Ohne Reinigungsmittel			
Reinigungsmittelkonzentration innen (%)	0,0			
Druck reinigen innen (bar)	0,0			
Temperatur reinigen innen (°C)	0,0			
Zeitdauer Reinigungszyklus außen (sek)	0			
Reinigungsmittelkonzentration außen (%)	0,0			
Druck reinigen außen (bar)	0.0			
Bereit				
Rezept Rezept Neues drucken speichern löschen Rezept	Rezept Ersteller: Rezept Version: Rezept Datum:			

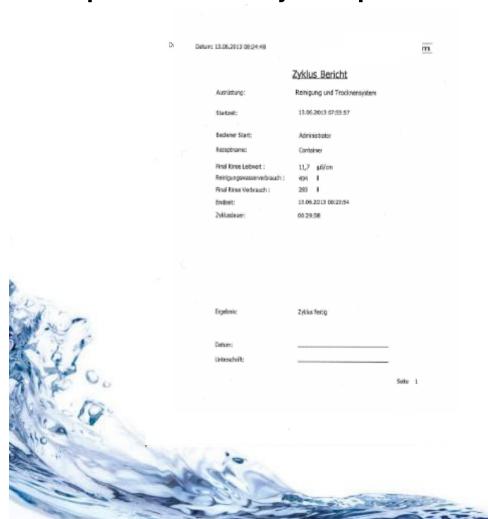


### **Operational Menu: Print**





### **Optional Menu: Cycle report**



Datum: 13.05.2013 08:24:51 ratio Rezept Bericht Rezept Ersteller: Administrator Recept Datum: 11.06.2013 16:42:01 Repept Version: 1,0 Contriber 1 - Contains Varreinigungszeit (Sek) Druck Vorreinigung (bar) Temperatur Vorreinigung (\*C) Zeitdauer Reinigungszylfus (Sek) 0 - Ohne Reinigungsmittel Druck reinigen (ber) Temperatur reinigen (\*C) Umwälzreinigung: Vol. zusätzliches Reinigungsmittel (I) Spillselt (Sek) Druck spillen (bar) 0 0,0 0,0 20 0,0 80,0 15,0 300 80,0 500 15,0 Temperatur spülen (\*C) Zeitdauer Final Ringe (Sek) Druck Final Rinse (bar) Temperatur final Rinse (\*C Geforderter Leitwert (µ5)/cr Trockenseit (5eli) Lufttemperatur für Kühlung (°C)

Seite 2



### **Operational Menu: Test**

Programm	Schritt	Schritt Beschreibung	Programm Status	Befehl		Besitzer	Parameter
Aufgabe Unreinseite zu Reinigungskammer	19	Warten auf freie Reinigungskammer	BETRIEB	halten	Abbruch		
Reinigen	1	Phase nicht aktiv	UNGENUTZT	starten			Parameter
Spülen	1	Phase nicht aktiv	UNGENUTZT	starten			Parameter
Final Rinse	1	Phase nicht aktiv	UNGENUTZT	starten			Parameter
Reinigungskammer zu Trockenkammer	1	Phase nicht aktiv	UNGENUTZT	starten			
Trocknen	1	Phase nicht aktiv	UNGENUTZT	starten			Parameter
Trockenkammer zu Parkzone	1	Phase nicht aktiv	UNGENUTZT	starten			
Parkzone zu Entnahme Reinseite	1	Phase nicht aktiv	UNGENUTZT	starten			
Reinigung Trockenkammer	15	Bereitstellung	HALTEN	wiederanlauf	Abbruch		Parameter
Reinigungskammer zu Aufgabe Unreinseite	1	Phase nicht aktiv	UNGENUTZT	starten			
<- Maschinen Parame							



#### **Standard CE- Documentation (Index)**

- 1.0 CD
- 2.0 Contact address
- 3.0 CE conformity
- 4.0 User manual / Password list after start up
- 5.0 Layout
- 6.0 Assembly drawings / Surface in contact with product
- 7.0 Spare parts list
- 8.0 Maintenance plan
- 9.0 Training plan
- 10.0 P&ID scheme & list
- 11.0 Electrical scheme & list
- 12.0 IO check list
- 13.0 Alarm check list



#### Qualifications-Support-Documentation

#### **QSD** Basic Package

- •CE-Docu : All as built
- •Data sheets of Suppliers / Standard
- •Calibration Certificates of process relevant components of suppliers
- Certificate 2.1 of the overall machine
- •SAT/FAT Proposals as built

#### QSD Extension I: Component-Certificates 2.1 or 3.1B

- •Certificates 2.1 or 3.1 of process-relevant / product contact components
- •Data sheets of suppliers / as built

#### QSD Extension II: (HDS/SDS/FS) / Englisch

- FS Functional (Design) Specification
- HDS Hardware Design Specification (Control)
- SDS Software Design Specification

#### QSD Extension III: IQ/OQ Documents / English

- Hamo Calibration SOP's
- IQ/OQ Standard-Documents; as built ( Hamo )





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