



Blanks Brush Cleaner

DTBC 2200

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1. GENERAL DESCRIPTION

The scope of supply for this quotation consists in the detailed design, procurement, fabrication and assembly of auxiliary elements related to the below description of material and in-house testing.

The machine is suitable for the installation in the FOL-area in front of a press line. The blanks are fed by means of an infeed conveyor unit, they pass through the brush cleaner by upper and lower wheels.

While running through the cleaner, the blanks are cleaned on both sides by linear brushes. The dirt is stripped out from the brushes transported into a filter by suction system. These results are possible thanks to:

- mechanical brush effect by the linear brush
- capillary adhesive forces between micro- moistened filament and particle
- reduction of electrostatic charges brought about by the antistatic liquid.

1. CUSTOMER TECHNICAL DATA

Type of materials	Steel, Aluminum
Thickness Steel	0,5 – 3,2 mm
Thickness Aluminum	0,5 – 3,2 mm
Max Thickness delta	2 mm
Material width (left to right)	Min 300 max 2150 mm
Material length (front to back)	Min 300 max 4500 mm
Material shape	Blanks - rectangle, trapezoid, parallelogram, any shape
Working speed	max 200 m/min
Labelling	Standard Dietronic
Application	Blanks

1.2 MACHINES TECHNICAL DATA

Total installed power supply brush cleaner	6 kW
Electrical equipment	380V, 50 Hz, 3 phases, N, PE (different voltage available)
General valve voltage	24 V DC
Control voltage	24 V DC
Blank brush cleaner air consumption	1200 NI/min at 6 bar
Air Supply (brush cleaner)	5 bar min
Communication with a line	Profinet
Safety interface	Safety PLC

2. MAIN HOUSING

Frame

The machine's substructure is a solid and waterproof welded steel construction.

Interface points with a press line

The electrics and pneumatics connections pass along the machine side in a cable chain and can be plugged at both sides a separate connection box for the Cleaner. At these connection box the machine must be connected from the customer side (air supply, power supply, cables interface – Dietronic will provide a document for details).

Blank Transportation

Smart Conveyor ensures 100% of sheet movement without slitting by motorized removable pinch rolls transport conveyor and lifting pneumatic system for the IN and OUT of the dry-cleaner.

Upper round crushless wheels anti-slipping used for small parts gives correct movement of sheet metal, the solution to transfer short blank through the machine with min size W 300x L 300 mm.

Cable and Pipe Channels

All channels to connect the connection boxes to the Portable HMI and the connection boxes to the refilling units must be provided from a customer (Dietronic will provide a document for details) as well as the channel to connect the connection box.

All cables and pipe from Dietronic side are scope of supply.

Electrical control

The machine operating by portable panel.

The control cabinet will be placed on the structure of the machine. The control is equipped by Siemens, Point I/O, which is placed in the control cabinet with air conditioning unit.

All the motors are Allen Bradley except brushes motors are MOTOVARIO

Armor Block Remote I/O Murr

Software

The software is provided in protected mode (only reading mode, not writing mode) until warranty expiration.

The default language is English.

3. GENERAL DESCRIPTION BRUSH CLEANER

The linear brush wipes transversally across the product surface. Particles will cling to the micro-moistened filaments which will thus remove them effectively and transport them to the suction connection.

These results are possible thanks to:

- mechanical brush effect by the linear brush
- capillary adhesive forces between micro-moistened filament and particle
- reduction of electrostatic charges brought about by the antistatic liquid.



Linear Brushes

Two Sword Brushes (**with 4 brushes belts for side**), wipe transversally across the material surfaces. The micro-moistened brush filaments remove even the most minute particles from the subject surface. The integrated pressure buffer provides for a constant wiping pressure and a premium cleaning result. The adjustment frame VE 25. allows a vertical adjustment of the Sword Brushes e.g. to adapt them to the material's thickness or to remove them from the material surface for maintenance purposes.

Pneumatic Height Adjustment

The cleaning module may be mounted on an adjustment frame to integrate a height adjustment:

1. Manual adjustment via crank (HVM)
2. Electrical adjustment via actuator (HVE). An automatic thickness adjustment is possible if HVE is linked to the overall control
3. Pneumatic adjustment via pneumatic cylinder (HVP).

Quick removal of module from material surface, e.g. in crash situations. The mechanical and the electrical height adjustment may be combined with the pneumatic adjustment.

The brushes are supported by pneumatic pistons for fast opening.

A safety device before on the entrance of the machine is connected to the signal to open fast the brushes. The upper brush can be open for 50 mm and the lower for 25 mm.

Self Cleaning of the Brushes

At the deviation, the linear brushes widen, so that particles may be detached more easily. Rotating steel elements (racks) remove the particles mechanically from the filaments. Additionally, there are compressed air driven nozzles, that blow into the brush filaments to cancel the capillary adhesive forces between the particles and the filaments. The suction system will absorb the particles.

Benefit: Improved self-cleaning and automatic cleaning process

Aluminum:

The cyclone has a level sensor to indicate when the tank is full suction duct is heated and monitored via temperature sensors
power supply and control

Steel:

Only cyclone without heating

The patented system permits effective removal of even very fine particles.

DTBR Cleaner 300 (Ingromat), Cleaning Liquid Applicator

The DTBR Cleaner 300 (Ingromat), is an antistatic cleaning agent. The brush filaments are micro-moistened with DTBR Cleaner 300, this providing an effective removal of even very fine dust particles

1. Micro-moistened brush filament with DTBR Cleaner 300 (Ingromat)
2. DTBR Cleaner 300 (Ingromat), sprayer SQL 51.
3. Distributor block VTB 100.
4. DTBR Cleaner 300 (Ingromat), regulator and filter unit IR 100. DTBR Cleaner 300 (Ingromat), filter, dosage and display of inner pressure of pressure buffer
5. DTBR Cleaner 300 (Ingromat), central supply pump, e.g. IS 102

The DTBR Cleaner 300 (Ingromat), liquid is supplied by a pneumatic from on frame tank of 20 lt tank with electric filling level control as well as pump and connections for refilling the reservoir.

Automatic refilling unit for the DTBR Cleaner 300 (Ingromat), tank from barrel or IBC Container 1000 lt.

The unit is provided with level sensor switch displayed on the HMI of the machine.

Calibrated nozzles control the amount of liquid applied on the single brush.


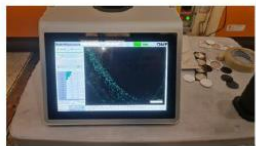
The consumption of the DTBR Cleaner 300 (Ingromat), is estimate in about 2L for hour.

Extraction System Control

The brushes are connected to an extraction system for the collection of the particular removed from the material. An additional device "Cyclone" between the brushes and the extraction system allows the improvement of the filters life. In case of aluminum pre-coated with dry-lube, the recovery channels and the Cyclone are heated.

BRUSHES SPECIFICATION	
NUMBER OF BRUSHES	8: 4 above, 4 below
FILAMENTS	black filaments in polyamide, length of filaments 19mm, diameter 0,2 mm
CYCLONE SYSTEM	for pre-separation of oil removed (SZY 400)
HEATING SYSTEM	60°C for all recovery channels
SUCTION FILTER	OEL-DS 1-0.28
BRUSH CLEANILESS LEVEL	< 0,5 mm particle size
ANTISTATIC LIQUID RESERVOIR	50 litres
UPPER BRUSH HEIGHT ADJUSTMENT	automatic positioning of the upper brush
SAFETY BRUSH DEVICE	laser sensor for anti-blank collision control for upper and lower brush (Dietronic will provide sensor and support, THE CUSTOMER will install on the infeed conveyor)

Test n°	Speed	Spot n°	Cleaning Result
1	100m/min	1	88,89%
		2	34,20%
2	100 m/min	1	98,28
		2	99,57%
3	150 m/min	1	82,82
		2	97,6
		3	97,26
		4	97,26
		5	23,37
		6	75,95



According to the specification 98% of particulars removal below 50 micro is required.

We can only confirm this requirement, when certain basic surface conditions are defined.

The cleaning results also can be influenced from initial conditions of the material.

4. GENERAL SPECIFICATIONS INCLUDING IN THE QUOTE

Certification:	QUASI MACHINE 2006/42/CE Machine Directive or CE Certification
Labelling:	DIETRONIC Standard
Electrical schemes and drawings:	PDF
Notes:	The software will be provided with comments only in English language. Until warranty expiration it will be provided only in readable version. Intellectual proprieties key-blocks of the program will be protected under password.
Cables Standard Length	Cable length 20 m

Electrical BOM Part List	
PLC	Siemens 1517F
HMI	Two hand panel or Siemens HMI 7 inches
DC Power Supply	Cabur / Murr
Cabinet Carpentry	Rittal / DKC
Protection	Siemens / Murr
Plugs	Harting
Sensors	Ifm / Electrotech
Encoder	Leine Linde
Safety Relay	No
Frequency controller	Siemens G120
Motor	SEW / Brushes (Motovario)
Armor block I/O	Murr
Pneumatic BOM Part List	SMC

Integration exclusion:

- Downloading from truck
- Positioning on existing rail of the machine. DieTronic is not responsible about rails condition and alignment
- Re-assembling of parts dismantled for transportation (DieTronic supervision included)
- All the activities that require to fix on the concrete
 - Referred for sensor IN/OUT of the machine from the line
 - Cable chain
 - Connection box
- Communication devices and cable for software interface between our machine and the line including cable channels
- Software integration to the line
- Positioning of IBS or Barrel holder
- Channels and installation for flexible pipes to connect the Antistatic liquid from the IBC or Barrel holder to the connection box (flexible pipes included)
- Channels and installation for cables to connect the machine from connection box to the HMI pulpit (cables included)
- Installation and bracket of crash sensor
 - Cable for the sensor
 - Interface between the crash signal from the line to our machine
- Power supply and cable from the line to the connection box
- Piping for air supply from line to the connection box