Final specifications

YPS1120

Approved by ___________________________ Received by ___________________________

Checked by(M) ___________________________

(E) ___________________________

(S) ___________________________

Prepared by(M) ___________________________

(E) ___________________________

(S) ___________________________

TOWA CORPORATION

Serial No. See next page

Manufacture date 5 August 2015

BGW990A0180870301-E-00

TOWA CORPORATION
<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Item</th>
<th>Contents</th>
<th>Name</th>
</tr>
</thead>
<tbody>
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<tr>
<td>MODULE NAME</td>
<td>Manufacturing No.</td>
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<td>---------------------</td>
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</tr>
<tr>
<td>1 MASTER MODULE</td>
<td>A0180870301</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 PRESS MODULE 1</td>
<td>A0180870302</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 PRESS MODULE 2</td>
<td>A0180870303</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 PRESS MODULE 3</td>
<td>A0180870304</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5 OUT MODULE</td>
<td>A0180870306</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 SLIT MODULE</td>
<td>A0180870306</td>
<td></td>
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</tr>
</tbody>
</table>
The final specifications are prepared for the above-mentioned type of the machine ordered. Please check and receive the final specifications. Specification change after the agreement of these specifications will influence the delivery date, and it may generate new costs. Therefore, if the specifications are to be changed inevitably, we ask you to have deliberations each time.
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1. Outline of the machine

This machine is an automated system of the resin sealing process for the semiconductor production. The feature of the multi-plunger molding method developed by TOWA is improved further to establish the high quality precise molding.

By adding the press modules (including the feeding rail of the loader/unloader) the machine is extended to the system of max. four press modules (four press units) and 8 frames taken. Extension can be applied flexibly according to the quantity of the production.

2. Features

1) As a concept of changing type and changing production quantity, making press units as modules enables production very flexibly.
2) By improving the module unit concept, modules and units can be changed and added according to the requirements
3) High productivity is attained by improving the machine time and mini. cycle time.
4) Maintenance ability of the die is improved due to no transfer unit before the die. Only the press unit that performs cleaning can be separated from the production.
5) Using the AC servo motor for press drive and transfer drive attained clean environment. Additionally it enabled the accurate and broad injection conditions.
6) The power consumption at the press section is reduced by approx. 50% compared to the hydraulic type by using the AC servo motor. The cooling function of the operating oil is not necessary.
7) A kit exchange system with the actual result is used, and type change can be performed in a short time.
8) Abundant variations and options are prepared.
### 3. Standard specifications of the machine

<table>
<thead>
<tr>
<th>No.</th>
<th>Main components</th>
<th>Number of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Press module (press units)</strong></td>
<td>3</td>
</tr>
<tr>
<td>1.</td>
<td>1. Multi-plunger mold (Chase and Chase holder)</td>
<td>3</td>
</tr>
<tr>
<td>1.</td>
<td>2. Lower ram molding press</td>
<td>3</td>
</tr>
<tr>
<td>1.</td>
<td>3. Balance presser unit (Plunger unit)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Automated devices</th>
<th>Number of units</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. <strong>Master module</strong></td>
<td>1</td>
</tr>
<tr>
<td>2. 1</td>
<td>Input magazine unit</td>
</tr>
<tr>
<td>2. 2</td>
<td>Lead frame drawing unit</td>
</tr>
<tr>
<td>2. 3</td>
<td>Pick &amp; place (IN) unit</td>
</tr>
<tr>
<td>2. 4</td>
<td>Lead frame carrier (IN) unit</td>
</tr>
<tr>
<td>2. 5</td>
<td>Tablet supply unit</td>
</tr>
<tr>
<td>2. 6</td>
<td>Loader unit</td>
</tr>
<tr>
<td>2. 7</td>
<td>Unloader &amp; auto-cleaner unit</td>
</tr>
<tr>
<td>2. 8</td>
<td>Safety cover</td>
</tr>
<tr>
<td>2. 9</td>
<td>Controller</td>
</tr>
<tr>
<td>2. 10</td>
<td>Intelligent functions</td>
</tr>
</tbody>
</table>

#### 3. Out module

| 3. 1 | Carrier unit | 1 |
| 3. 2 | Gate break unit | 1 |
| 3. 3 | Pick up unit (Main body & rail part) | 1 |
| *1 3. 4 | Stack magazine unit (2M/G contained) | 1 |
| *2 3. 5 | Slit magazine unit | 0 |
| 3. 6 | Safety cover | 1 |
| 3. 7 | Dust collector | 1 |

#### 4. Accessories

| 4. 1 | Instruction manual | ※ |
| 4. 2 | Tablet stocker | 1 |
| 4. 3 | Cull box | 1 |
| 4. 4 | Air gun | 1 |
| 4. 5 | Controller for manual operation | 1 |
| 4. 6 | Standard tools (Only for No.1 machine, standard attachment) | |

*1 Only for the stack magazine containing type
*2 Only for the slit magazine containing type
*3 ※ Input the necessary total quantity in Section 10.4 Optional specifications. Otherwise, no instruction manual will be attached.
4. Works for carry-in and installation

4.1 Machine size at the time of installation

The machine is delivered by separating it into the master module, press module, and out module.

Each module requires the carrying jig respectively.

<table>
<thead>
<tr>
<th>Module</th>
<th>Size (W) x (D) x (H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master module</td>
<td>1295 x 1630 x 1990</td>
</tr>
<tr>
<td>Pres module</td>
<td>665 x 1630 x 1990</td>
</tr>
<tr>
<td>Out module</td>
<td>670 x 1630 x 1990</td>
</tr>
<tr>
<td>Slit module</td>
<td>830 x 400 x 1835</td>
</tr>
</tbody>
</table>

Refer to 17. General drawing (1) for the dimensions of each module.

Jigs required for connection (Check whether “Yes” or “No”)

- Carrying and lifting jig for master module
- Rope guide (for master module)
- Carrying jig for press module
- Turn-over prevention jig for press module
- Carrying and lifting jig for out module
- Rope guide (for out module)
- Carrying and lifting jig for Slit module
- Rope guide (for Slit module)

4.2 Works at the time of installation

The scope of work responsibility at the time of installation is as follows:

<table>
<thead>
<tr>
<th>№</th>
<th>Item</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Machine delivery</td>
<td>On the truck</td>
</tr>
<tr>
<td>2</td>
<td>Carry-in into the site &amp; installation</td>
<td>●</td>
</tr>
<tr>
<td>3</td>
<td>Module units connection</td>
<td>●</td>
</tr>
<tr>
<td>4</td>
<td>Power connection</td>
<td>●</td>
</tr>
<tr>
<td>5</td>
<td>Air source piping and connection</td>
<td>●</td>
</tr>
<tr>
<td>6</td>
<td>Exhaust duct connection</td>
<td>●</td>
</tr>
<tr>
<td>7</td>
<td>Air feeding duct connection</td>
<td>●</td>
</tr>
<tr>
<td>8</td>
<td>Test run &amp; adjustment</td>
<td>●</td>
</tr>
</tbody>
</table>

5. Parts for adjusting the machine

Supply the following parts by the date shown below for assembling and adjusting the machine at our site.

<table>
<thead>
<tr>
<th>№</th>
<th>Part name</th>
<th>Quantity (for every type)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lead frame</td>
<td>For 300 SHOT each</td>
<td>One month before</td>
</tr>
<tr>
<td>2</td>
<td>Tablet</td>
<td>For 300 SHOT each</td>
<td>One month before</td>
</tr>
<tr>
<td>3</td>
<td>Input magazine</td>
<td>Four each</td>
<td>One month before</td>
</tr>
<tr>
<td>4</td>
<td>Output magazine</td>
<td>Four each</td>
<td>One month before</td>
</tr>
<tr>
<td>5</td>
<td>Bonding frame</td>
<td>(Inform separately.)</td>
<td>(Inform separately.)</td>
</tr>
</tbody>
</table>
6. Basic specifications

Basic usage. (Refer to the 17. General drawing for each location.)

6. 1 Feeding in work

6-1-1: Input magazine
Input from the front of the machine. (left-hand side of the whole machine)
Press the open/close check button to unlock the door lock, open the door,
and then feed the input magazine. (Peripheral moving parts stop while feeding.)

6-1-2: Compound (resin)
Fed from the left-hand side of the machine into the stocker (Capacity: 15L).

6. 2 Taking out work

6-2-1: Output magazine
Put in from the front of the machine. (right-hand side of the whole machine)
Press the open/close check button to unlock the door lock, open the door,
and then take out the input magazine. (Peripheral moving parts stop while taking out.)

6. 3 Disposing of cull & runner

6-3-1: Cull & runner disposal box
Cull & runner are disposed of into the box (Capacity: 31L) built-in the machine
(standard specification) automatically. The box is taken out from the right-hand side
of the whole machine.

6. 4 Maintenance

6-4-1: Cleaning die
Cleaning the die can be performed by separating the designated press module only
from the product operation. In this case, the cover at the rear of the die closes for
avoiding the loader/unloader being touched.

6-4-2: Supplying oil to the press section moving part
Concentrated piping is arranged at the lower front part of the press section for the
moving parts (link section) of the press section. Oil can be supplied using the manual
grease gun at the oil supply port. Additionally automatic oil supply unit can be
attached optionally.

6-4-3: Maintenance of each part
The maintenance door is provided at each moving section (unit).
One handy pendant (GOT) is attached as standard, which is effective for actions
when an error occurred and when maintained.

The detailed usage and a detailed maintenance are described in the instruction manual,
or consult out service personnel in charge.
We provide the maintenance training, however, the user shall bear the costs.
The specifications which differ from the standard are written in Section 10 and 11.

6.5  Object lead frame

1) Applicable range
Length 100 to 260mm
Width 15 to 90 (80)mm
※ They may be limited according to the die layout.
※ Even if the lead frame satisfies above dimensions, some may not be applied.
    It shall be determined by a separate business agreement.
※ If the incomplete molding detection mechanism is installed,
    the width of an applicable lead frame becomes the dimension in ( ).

6.6  Molding materials

1) Small φ tablet  φ 13, 14, 16, 18, 20 mm
2) Size MAX  φ 20 × 35 mm
    MIN  φ 13 × 11.7 mm
3) Rate of compression 90 % or more

6.7  Cycle time

1) Machine time approxi. 18 sec.
2) Molding time User’s estimation
3) Mini. cycle time 4 press units: approxi. 72 seconds

※ Above machine & cycle time are under the following conditions.
    ○ Injecting time + cure time: 54 sec.
    ○ LF feed section: Rope transfer
    ○ L/F preheater unit not used.
    ○ Number of TAB pots: Five
    ○ Eject speed: Fastest
    ○ Cleaner speed and number: Fastest, Once
    ○ Cull cooling time: 0 second
    ○ Release film unit not used.

※ Machine time mentioned above is a thing under a right note condition.
Machinetime becomes device ability under the condition that does not affect molding quality.
By a molding condition, molding quality, a cleaning process, materials origin, contents of special specifications, please understand that machinetime, cycle time change.

※ Above machine time and cycle time is in the case that the injection and cure times are the same.
※ The machine time, cycle time, or molding time may be extended due to each process condition.
※ Preheating of the tablet and lead frame in the die are added to the molding time.
※ If the LF feed unit is changed to the grip transfer,
    the machine time is extended by approx. 3 seconds.

※ If the number of tablet alignment lines are six or more,
    the adding time to the cycle time changes according to the length.
    It shall be determined by a separate business agreement.
※ Lead frame preheating time in the case of the mini. cycle time is approx. 17 seconds.
※ When the release film handler is used, the machine time is extended by approx. 5 to 10 seconds. (due to influence of die and film)
※ When the FM unit is used, the machine time is extended by approx. 1 to 2 seconds.
※ Adjusting the eject speed of the product and runner may influence the machine time.

※ User’s specifications (special specifications) may influence the productivity.
※ The operation speed of supplying, taking out, and containing may be adjusted according to the product and materials. They may influence the cycle time.
6. 8 Input magazine

1) Type
   Slit magazine type

2) Applicable magazine dimensions
   Length 100 to 270mm
   Width 25 to 100mm
   Height 170mm

3) Magazine set space 400mm
   ※If the difference between LF length and magazine length is
   17mm or more, a special measure is needed.
   ※ In this machine, Max Magazine Width is 104mm. (This is special size.)

6. 9 Number of molding
   Two frames/one press unit

6. 10a Output magazine (Stack magazine type)

1) Type
   Stack magazine type

2) Applicable magazine dimensions
   Length 103 to 263mm
   Width 23 to 95mm
   Height 200 to 480mm

3) Number of magazine sets
   Two

6. 10b Output magazine (Slit magazine type)

1) Type
   Slit magazine type

2) Applicable magazine dimensions
   Length 100 to 270mm
   Width 25 to 100mm
   Height 170mm

3) Number of magazine sets
   400mm

6. 11 Release film

1) Applicable range
   Winding dia. dia. 180 mm Max.
   Width 100 to 300mm
   Thickness 25 to 100 μm
   Core inner dia. dia. 76.2 ± 0.5mm (3 inch)
   Core material Plastic
   Minimum feed per stroke (recommended value) 610mm

※6.10a, b are selectable according to the out magazine specifications. (out module)
※6.11 is in the case that the film mold option (release film handler) is mounted.
7. General specifications of the machine

7.1 a. Outside dimensions of modules ※ Projections such as ducts are not included.
   1) Master module (not include one press unit) 1295 (W) × 1630 (D) × 1990 (H)
   2) Press module (four press units) 665 (W) × 1630 (D) × 1990 (H)
   3) Out module 670 (W) × 1630 (D) × 1990 (H)
   4) Slit module 830 (W) × 400 (D) × 1835 (H)

※ All dimensions are to the outside of the covers. (Projections are not included.)

b. Outside dimensions of the machine (after docked) ※ Projections such as ducts are not included.
   1) Master module + four press modules + out module 4625 (W) × 1630 (D) × 1990 (H)
   2) Master module + four press modules + slit module 4795 (W) × 2030 (D) × 1990 (H)
※When release film option is applied.  3) Master module + four press modules + out module 4625 (W) × 1630 (D) × 2030 (H)
※When release film option is applied.  4) Master module + four press modules + slit module 4795 (W) × 2030 (D) × 2030 (H)

7.2 Mass of the machine

1) Master module (no include one press unit) Approx. 2.5t
2) Press module (one press unit) Approx. 3.1t
3) Out module Approx. 1.3t
4) Slit module Approx. 0.5t

The press section includes the chase holder and chase (Standard: 45kg/type).

Mass of the target machine Approx. 13.1 t

※For now, the mass of device is not an actual measurement but an assumed value.
7.3 Lead frame transfer direction

Left to Right

7.4 Height of working surface

1340 mm ※Frame feed line

7.5 Power supply

1) Power supply AC200V 3Phase 50Hz/60Hz
2) Power consumption (Max.)
   Two press units 25.5 kVA
   Four press units 39.5 kVA
3) Power consumption
   Two press units 6.0 kVA
   (Normal operation) Four press units 9.5 kVA
4) Power connection
   Terminal connection at the left rear upper part of the machine
5) Earth leakage circuit breaker (ELCB)
   Type: NV225-CWU 3P 150A 200V <MITSUBISHI>
   3Phase, Rated current: 150A
   Operation sensitive current: 100mA

7.6 Air source

1) Air pressure 0.4 to 0.6MPa (4.6 to 6.1Kgf/cm²)
   (※With regulator)
   Lowered air pressure detecting function: Equipped
   Manufacturer name: SMC
   Type: IS1000M~40
2) Supply quantity: 500NL/min, clean dry air
3) Connecting port: Female thread for piping Rc1/2”

(With three positions and two positions are reserved)

※ In the case of release film retaining (+ frame retaining specification)
   (for every press unit)
1) Operation air pressure 0.4 to 0.6MPa (4.6 to 6.1Kgf/cm²)
   (※With regulator)
   Lowered air pressure detecting function: Equipped
   Manufacturer name: SMC
   Type: IS1000M~40
2) Supply quantity: 250(+200)NL/min, clean dry air
3) Connecting port: Reserved port is used.

※ If above air pressure and flow rate cannot be assured, the machine may not work properly.

7.7 Exhaust duct

1) Necessary exhausting quantity
   Master Module 3 m³/min
   Out Module 10 m³/min
   Press Module 3 m³/min
   Note) Each Press

   Master module
   Press module
   Duct for φ 150mm, Protruded quantity: 150mm
   Duct for φ 150mm, Protruded quantity: 150mm
   1 /press unit

   Out module
   Duct for φ 150mm, Protruded quantity: 150mm
   1

※ If above exhaust quantity cannot be assured, heat may be remained inside the machine.

7.8 Coating color

(If the outer color is not designated)

TOWA standard color
Japan Paint Industry Association: S4–341 (ivory white) half gloss

※ Please refer to 18. Appendix, the nameplate of machine, for the detail of utility requirements by the press increase or decrease.
8. Details of each part

8.1 Lower ram molding press (press module)

1) Clamp
   - Mold clamp capacity: 392～1176kN (40.0～120.0tf)
   - Stroke: 145mm (Servo motor drive) with soft clamp

2) Transfer
   - Transfer capacity (two pressures setting): 2.9 ～ 31.4kN (0.3～3.2tf)
     - Minimum setting unit of pressure: unit of the 1st place of a decimal point
     - Injecting speed (10 speeds setting): 0.1～15.0mm/sec
     - Minimum setting unit of speed: unit of the 1st place of a decimal point
     - Stroke: 110mm (Servo motor drive)
     - Transfer ability 49.0kN (5.0tf) specification is also possible by the option correspondence.

3) Balance
   - Pressure: Plunger equalizing mechanism
   - Spring type

4) Die
   - Chase holder (STD type)
     (Standard specification): Weight
     XL type: Approx. 160Kg
   - Chase (STD type)
     (Standard specification): Weight
     XL type: Approx. 70Kg

※ If the type of the die is different from the STD type, ask our business personnel in charge or die technical personnel for the weight.

8.2 Loader TAB shoot dust collecting unit (press module)

1) Function
   - After the loader casts the tablet into the die, the tablet shoot part is cleaned when it is retracted.

2) Attachment location
   - Rear surface of each press unit

3) Drive method
   - Switching dust collecting (Unloader collector have the priority.)
     (Switching to the TAB unit dust collector): Air cylinder
   - Moving dust collecting opening up and down: Air cylinder
### 8.3 Control section & user interface

**1) Controller**
- Programmable controller: CS-1H (OMRON)
- Servo controller (press section): MP2300 (YASKAWA)
- Servo controller (transfer section): MP2310 (YASKAWA)

**2) Mold temperature control**
- Controller: E5ZN (OMRON)
  The mold temperature upper limit value: to 190°C
  ※ The sensor which prevents an excessive temperature rise set value: 230°C (Fixed value).
  Please perform the temperature setting of mention in the final specifications of the mold chase block.
  - Number of channels: 8/press unit, 2/master unit

**3) Heater (one press)**
- Heater: For upper die (four) 0.75kW × 4 = 3.0kW
  - For lower die (four) 0.75kW × 4 = 3.0kW
- Platinum resistance temperature sensor: For upper die: four, For lower die: four
- Over heating prevention thermostat: For upper die: one, For lower die: one
  ※ Heater, platinum resistance temperature sensor, and over heating prevention thermostat are parts of the die.

**4) Operation system**
- Display language: [English][Japanese]
- Display unit: [SI unit][Non-SI unit]
- Touch panel: Liquid crystal display monitor & FA computer
  - 15.0 inch LCD Ultrasonic type touch panel specification
  - FA computer: With built-in uninterruptible power supply unit (UPS)
    - OS: Windows (corresponding to the designated language above)
- External output ports equipped with the machine
  - USB (Ver.1 standard) × 1
  - LAN (10BaseT/100BaseTX)
- Caution: The following are optional parts.
  - KEYBOARD (Corresponding to the language designated above)
  - Drives (CD-ROM and so on)
    ※ Commercial USB devices can be connected.

**5) For manual operation**
- Teaching pendant (cable connection type)
  - Controller: GOT series (MITSUBISHI)
  - Display: SI unit
    - Language: [English][Japanese]
    Unit and language are used showed above.

**6) Control voltage**
- 30V DC or less

※ Please contact us if nonstandard unit or nonstandard language are desired.
(There may be a case that the designated specifications cannot be applied due to the size of the display section and number of digits.)
8.4 Input magazine unit (master module)

1) Function

This unit takes out the lead frames from inside the loaded magazine and feeds them to the alignment section.
The lead frames are taken out from the lower slot of the magazine one by one.

2) Magazine set

- Set in the specified same direction.

3) Number of magazine sets

- Changes according to the magazine width. (Set space: 400mm)

4) Magazine pitch

- Optional: Set on the screen (by using the servo motor)

5) Replacing of the magazine

- An alarm is issued when the magazine becomes empty. However, it can be replaced at a certain time.

6) Drive

- Full magazine pusher part: Air cylinder
- Elevation part: AC servo motor
- Lead frame push out (pusher): Air cylinder
- Load detection (1.18 N (spring type))
- Empty magazine pusher part: Air cylinder

Type change part

- Elevator magazine receiving arm
- Frame pusher (adjusting type)
8.5 Frame feed unit (master module)

8.5.1 Rope transfer type (Plug in unit: Can be replaced with the grip transfer type.)
※ The structure of the rope transfer type is simple, and it can draw the magazine at higher speed compared to the grip transfer type.

1) Function
Receives L/F from the magazine and the direction and type of L/F are judged.

2) Transfer type
   - Drawing: Rope (belt conveyor) transfer

3) Drive method
   - Rope (belt conveyor) drive: Induction motor
   - Sensor shift: Air cylinder

Type change part
   - Lead frame guide rail
   - Sensor block for detecting the type direction

4) Judging of the direction and front/rear surfaces, and checking of arrival
   - Judging of the direction and front/rear surfaces (beam sensor): Four
   - Checking of arrival (beam sensor): One

※ They may be unable to judge due to the design of the lead frame.

8.5.2 Grip transfer type (Plug in unit: Can be replaced with the rope transfer type.)
※ The drawing speed of the frame can be adjusted, and can cope with a warp of the frame.

1) Function
L/F is received from the magazine and the direction and type of L/F are judged.
Positioning in the width direction is performed by expanding/retracting the side guide when drawing the frame. The guide is also attached in the upper directions to cope with a warp of the frame.

2) Transfer type
   - Drawing: Gripper feed type

3) Drive method
   - L/F feed: AC servo motor
   - Drawing gripper (with pressure reduction valve): Grip cylinder
   - Expanding/retracting side guide: Air cylinder
   - Opening/closing upper guide: Air cylinder

Type change part
   - Lead frame guide rail
   - Sensor block for detecting the type direction

4) Judging of the direction and front/rear surfaces, and checking of arrival
   - Judging of the direction and front/rear surfaces (beam sensor): Four
   - Checking of arrival (beam sensor): One

※ They may be unable to judge due to the design of the lead frame.
8.6 Pick & place (IN) unit (master module)

1) Function

Receives the frames, and align them to the lead frame carrier unit according to the die layout.

2) Drive method

- Driving to right and left: AC servo motor
- Driving up and down: Air cylinder
- Driving 180° rotation: Rotary actuator
- Lead frame clamper: Air cylinder
  with lead frame detecting sensor
  with lead frame position failure detection

Type change part

- Lead frame clamp unit

8.7 Frame carrier (IN) unit (master module)

(※Plug in unit: Frame preheat function can be added.)

1) Function

Transfers the lead frame aligned according to the die layout to the loader.

2) Number of loading lead frames

- Two/one line

3) Drive method

- Frame transfer: Air cylinder

Type change part

- Frame alignment plate

8.8 Frame preheat unit (master module)

(※Plug in unit: Can be added to the frame carrier (IN) unit.)

1) Function

Transfers the lead frame aligned according to the die layout to the loader.
At this moment, the lead frame is preheated.
There are two lines of the lead frame carrier to ensure the preheating time.

2) Number of loading lead frames

- Two/one line x two sets (when the preheat function is added)

3) Drive method

- Frame transfer: Air cylinder
- Frame clamp (for preventing warp): Air cylinder

Type change part

- Frame alignment heater plate (with mechanical clamper)

4) Lead frame preheater

- 1) Temperature setting range: to 180℃
- 2) Preheater: 1.0kw (x two lines)
  Platinum resistance temperature sensor: One (x two lines)
  Over heating prevention thermostat: One (x two lines)
8.9 Tablet supply unit (master module)

1) Function
Takes out tablets from the tablet stoker, discharges the failed ones, align tablets and then transfer them to the loader.

2) Stock section
- Capacity of the stocker: 15L
- Tablet feed out function: Parts feeder
- Parts feeder over flow: Air cylinder
- Checking Parts feeder over flow: Beam sensor
- Residual tablets detection: Beam sensor
- Residual quantity detection inside parts feeder: Proximity sensor
- Dust collecting: Parts feeder rail section (switching with the cleaner section)

3) Tablet alignment section
- Tablet alignment type: TAB tube type
- Number of TAB tubes: Two
- Tablet stopper: Air cylinder
- Tablet clamp: Air cylinder
- Tablet failure detection: Mass of tablet ±0.15g detection
- Failed tablet discharge: Air cylinder
- Tablet insertion: Air cylinder
- Checking tablet tube insertion: Beam sensor
- TAB tube shift: Air cylinder
- TAB tube clamp: Air cylinder
- TAB tube rotation: AC servo motor
- TAB tube transfer: AC servo motor
- Tablet holder insertion: Air cylinder
- Checking tablet holder insertion: Beam sensor
- Expanding/retracting of holder: Air cylinder
- Dust collecting: Upper surface of tablet holder (switching with the cleaner section)

Type change part
- Tablet tube

4) Tablet shoot lifter section
- Lifter short stroke drive: Air cylinder
- Lifter long stroke drive: Air cylinder
- Tablet pusher: Air cylinder

Type change part
- Tablet holder
- Tablet pusher
8.10 Loader unit (master module)

1) Function

Receives two lead frames aligned at the lead frame alignment unit and tablets aligned at the tablet feeding unit, and transfers to the die to load them. It also collects dusts inside of Loader tablet shoot.

2) Drive method

- Driving back and forth
- Driving right and left
- Lifting and lowering drive
- Lead frame clamp
- Tablet casting drive
- Tablet shutter

Type change part
- Loader clamp unit

8.11 Unloader & cleaning unit (master module)

1) Function

Takes out the molded lead frame from the die and transfers to the out module. Cleans the molded die.

2) Drive method

- Driving back and forth
- Driving right and left
- Lifting and lowering drive
- Lead frame clamp
- Cull taking out
- Cull gate cleaning
- Cleaning method
- Rotation brush part
- Brush driving up and down
- Brush material
- Dust collecting connection (up/down)

Type change part
- Unloader clamp unit

Capability of the unloader cleaner dust collecting part
- Flow speed (average) 15 m/s

※As for the capacity of the cleaner part, since the die specifications and resin grade greatly influence, therefore, consult TOWA separately if die contamination or resin tailings is considered as a problem.
8.12 Frame carrier (OUT) unit (out module)

1) Function
Transfers the molded lead frame taken out by the unloader to the gate break position, cull disposal position, and pick & place position.

2) Drive method
- Driving back and forth: AC servo motor

Type change part
- Carrier pallet
- Positioning plate inside the carrier

8.13 Gate break unit (out module)

1) Function
Clamps the lead frame molded by the carrier pallet and lead frame clamper, and cuts the gate for separating cull and lead frame to dispose of the cull.

2) Gate break method
   ① Butterfly method (lower gate) (for standard spec.)
   ② Butterfly method (upper gate) (for optional spec.)
   ③ Punch method (pin push down) (for optional spec.)

3) Drive method
- Cull clamper (upper): Air cylinder
- Gate break unit: Air cylinder
- Cull clamper (lower): Air cylinder
- Cull gate cleaning: Air blow
- Cull separation (upper gate butterfly method): Air cylinder

Type change part
- Gate break unit
- Cull clamper block
- Parts associated with changing the gate break method

Refer to “User’s specifications” for the gate break method other than standard one.

Caution: TOWA will not held liable to the gate remaining & frame deformation since they are influenced by resin and frame greatly.

4) Cull disposal
- Pallet separation: Air cylinder
- Cull box capacity: 31L (with full detection by shot count)

※1 For the external cull box specification (user’s specification), the cull box is installed at the back side of the machine.
- Cull discharge conveyor: AC motor
8.14 Pick up unit (out module)

1) Function
Picks up the molded lead frame after the gate break from the carrier to transfer it to the frame containing unit.

2) Drive method
- Driving up and down: Air cylinder
- Rotation drive: Rotary actuator
- Lead frame clamper: Mechanical clamper (air driven) with lead frame detection

Type change part
- Frame clamp unit

8.15 Stack magazine unit (out module)
※Applicable containing magazine: Stack magazine type

1) Function
Sets the magazine and contains the molded lead frame.

2) Drive method
- Elevation: Reversible motor with sensor for one pitch down

3) Magazine set
- Sets magazines in the designated direction one by one.
  Type change part
  - Magazine containing unit
  - Elevation unit positioning plate

4) Number of magazine sets
- Two magazines

8.16 Dust collector (out module)

1) Specifications
- Power supply: 3phase, 200V, 50/60Hz
- Motor: 3.7KW, 2P
  Totally-enclosed fan cooled long shaft type
- Dust collecting performance (at the maximum)
  - Max. frequency: 98Hz
  - Rotation speed: Approx. 2895/3750rpm
  - Wind quantity (max.): 10.9m³/min
  - Wind pressure (max.): -16.4kPa
- Primary separation method
  - Square shape molding filter
  - Filtration area: 1.5m²
- Oil supply
- Lowered dust collecting power detection

2) Positions of dust collection
- Auto-cleaner part: Switching type
- Tablet hopper part: Switching type
- Parts feeder part: Switching type
- Tablet holder part: Switching type
- Loader tablet shoot cleaner part: Switching type
8.17 Frame pusher unit (slit module)
※Applicable containing magazine: Slit magazine type

1) Function
Receives the molded frame from the pick up unit, and contains it in the slit magazine using the pusher.

2) Drive method
- Frame pusher: Air cylinder
  Over load detection: 2.5N (spring type)
- Guide rail shift: Air cylinder

Type change part
- Frame guide rail
- Frame pusher (adjusting type)

8.18 Slit magazine unit (slit module)
※Applicable containing magazine: Slit magazine type

1) Function
Receives the frame pushed out by the frame pusher unit and contains it in the slit magazine.
Lead frames are contained one by one from the lower slot of the magazine.

2) Magazine set
- Set in the specified same direction.

3) Number of magazine sets
- Changes according to the magazine width. (Set space: 400mm)

4) Magazine pitch
- Optional: Set on the screen (by using the servo motor)

5) Replacing of the magazine
- An alarm is issued when the magazine becomes empty. However, it can be replaced at a certain time.

6) Drive method
- Empty magazine pusher part: Air cylinder
- Elevation part: AC servo motor
- Full magazine pusher part: Air cylinder

Type change part
- Elevator magazine receiving arm
- Frame pusher (adjusting type)
8.19 Safety cover

1) Function
To prevent all or any part of the body of the working personnel from entering the machine while it is operating, covers are provided, and doors are provided at the places where operation or maintenance is required. The door interlock switch with a locking mechanism are installed to the door that can be opened/closed so that the door can be opened/closed only when the machine is stopped. (The maintenance door that requires tools for opening and closing is excluded.)

2) Type of the door interlock switch with a locking mechanism
   - D4GL series
     (Manufacturer name: OMRON)
     - Master module
       - In magazine casting door (one position)
       - Left side door of the machine (two positions)
       - Rear door of the machine (two positions)
     - Press module
       - Front and rear doors at the press section (two positions/one press unit)
     - Out module
       - Out magazine casting door (one position)
       - Right side door of the machine (one position)
       - Rear door of the machine (one position)

   The doors other than those with a locking mechanism are screw retaining door or door with a lock.

3) Clear window
The clear resin cover is provided at the place where internal check is required.
   - Materials: Antistatic polycarbonate

4) Inner lighting
A LED light is mounted at the main mechanisms and work transfer part.
   Mounted positions
   - Alignment unit part one
   - Tablet supply part unit part one
   - Gate break unit part one
   - Press unit part one each
8.20 Optional unit (related master module)
Various functions can be added to each unit. Consult our personnel in charge for the details.

8.20.1 Clean air module unit （※Master module cover）
1.1) Function
The clean air module unit is installed to the input magazine part. The air cleanliness is improved around the frame before molded.

1.2) Clean air module
• Part No : ********<*****>

2.1) Function
The clean air module unit is installed to the lead frame alignment part. The air cleanliness is improved around the frame before molded.

2.2) Clean air module
• Part No : ********<*****>

8.20.2 Tablet supply part cooling unit （※Master module cover）
1) Function
Cool tablet feeding part to reduce the effect of ambient temperature, and also avoid deteriorating of the tablet.

2) Cooling unit
• Part No : ********<*****>

8.20.3 Ionizer unit （※Master module, Out module）
1.1) Function
It removes in the following place with the electricity of the frame.
• The upper part of Frame feed unit and Frame carrier(in) unit.

1.2) Ionizer unit
• Part No. : SJ-H108V <KEYENCE>

2.1) Function
It removes in the following place with the electricity of the frame.
• Frame delivery part from Unloader unit to Frame carrier(out) unit.

2.2) Ionizer unit
• Part No. : SJ-H036V <KEYENCE>

3.1) Function
It removes in the following place with the electricity of the frame.
• Frame storage part of Stack magazine unit.(Out rail unit in case of Slit magazine unit)

3.2) Ionizer unit
• Part No. : SJ-F030 <KEYENCE>
8.21 Optional unit (related press module)
Various functions can be added to each unit.
Consult our personnel in charge for the details.

8.21.1 Automatic oil supply unit (※Press unit)
1) Function
The unit that supply grease automatically to each part of the press unit
(link part, tie bar section).
Automatic oil supply unit is located nearby Out Module.
2) Automatic oil supply unit
   · Part No.: ********<*****>

8.21.2 Frame vacuum unit (※Press unit)
1) Function
The frame vacuum function is added to the die (lower die).
2) Drive method
   · Frame vacuum: Vacuum retaining
      with retaining check (two/one press unit)

8.21.3 High vacuum molding unit "FM unit" (※Press unit)
1) Function
The feature of the multi-plunger molding method was developed further.
Inside of the die while molding is made vacuum atmosphere to shut off the
air that will be the cause of “void” generation in the molded product.
2) Specifications
   Refer to “FM system” specifications.

8.21.4 Release film handler unit (※Press unit)
1) Function
The unit used for molding using film.
The unit that winds out and winds the release film by a certain length.
This is installed near the press unit upper die and consists of the winding
out part and winding part. One unit/press unit
2) Release film handler part
   · Winding out/winding section: AC servo motor
   · Feed length: Possible
   · Residual quantity/full wound detection: Encoder count
   · Unit up/down: Air cylinder
   · Film suction: Vacuum ejector
   · Film suction check: Vacuum sensor
   · Static electricity eliminator (winding out part): Equipped
   · Fan (for servo motor cooling): Equipped

※Mounting the release film handler changes the press unit as follows:
   Outside dimensions: 360mm (in the upper direction)
   Weight: Approx. 50kg (increase)
### 8.21.6 Flexible clamp unit (※Press unit)

1) Function

A die side drops depending on thickness of a frame and realizes the most suitable clamp. A device can be equipped with the die for flexible soft clamp.

2) Drive method

- Cavity lock mechanism: Air cylinder

※When the frame vacuum, release film handler and flexible clamp is mounted, the new air supply from the ceiling part of the master module is required.
9. Variation specifications
The following is prepared for variation specifications, however, they may not be able to apply according to the user’s specifications (special specification). In this case, consult our personnel in charge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>In compliance with CE marking</td>
<td>In compliance with Europe standard (EN standard)</td>
<td>Yes</td>
</tr>
<tr>
<td>9.2</td>
<td>In compliance with SEMI S2, S8</td>
<td>In compliance with SEMI standard for North America</td>
<td>No</td>
</tr>
</tbody>
</table>
### 10.1 Optional specifications (related utilities)

The following is prepared for variation specifications, however, they may not be able to apply according to the user’s specifications (special specification). In this case, consult our personnel in charge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1.1</td>
<td>Changing power supply specifications</td>
<td>3Pase AC 380 V, Hz 50</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard: 200V, 50/60Hz</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>※ The transformer other than 200 V shall be installed externally.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Preparation of transformer:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transformer specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type: 3-phase type</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency: 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mounting instruction: terminal installation</td>
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<tr>
<td></td>
<td></td>
<td>Rating continuous:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary (Refer to customer plant)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary 190V, 200V, 210V</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capacity: 40kVA (4 Press), 20kVA (2 Press)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Insulation: B class 90°C temperature rise limit</td>
<td></td>
</tr>
<tr>
<td>10.1.2</td>
<td>Vacuum gun specifications</td>
<td>One air gun is attached as standard, but this is changed to the vacuum gun specification. (air suction specification)</td>
<td>Yes</td>
</tr>
<tr>
<td>10.1.3</td>
<td>Adding emergency stop switch</td>
<td>If there is a designation in addition to a standard part, show the position and height in the general drawing. Standard specifications are as follows:</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Emergency stop switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manufacturer name: FUJI</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type: AR22V4R-03R</td>
<td></td>
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<tr>
<td></td>
<td>※ A guard ring is attached except for the teaching pendant section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Master module: three</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Press module: one each</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Out module: three</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slit module: one</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>※ Two out modules are attached when the slit module is connected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Teaching pendant: one</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>※ Refer to the general drawing for the attachment position.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10.2 Optional specifications (related outside appearance)

The following is prepared for variation specifications, however, they may not be able to apply according to the user’s specifications (special specification). In this case, consult our personnel in charge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2.1</td>
<td>External painting</td>
<td>Color sample: Yes/No(Approx. 300mm)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Color classification method is shown in the general drawing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Show color classification method in the general drawing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>※If color sample will not be provided, priority is given to paint symbol.</td>
<td></td>
</tr>
<tr>
<td>10.2.2</td>
<td>External painting special specifications</td>
<td>Laser tone</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With gloss</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Without gloss</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Others ( )</td>
<td></td>
</tr>
<tr>
<td>10.2.3</td>
<td>Signal tower</td>
<td>Manufacturer name: Q-Light</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type: ST56MEL-BZ (PI.SHORT INTERVAL)-3-DC24V-RAG</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>External form: φ 56 Height 207mm (three colors)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard specifications</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If you have to designate Model, Maker and Specs about Signal tower, please contact to our Sales Staff.</td>
<td></td>
</tr>
<tr>
<td>10.2.4</td>
<td>Buzzer</td>
<td>If you have to designate Model, Maker and Specs about Buzzer, please contact to our Sales Staff.</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Built in the signal tower is provided as standard.
10.3 Optional specifications (related interface)

The following is prepared for variation specifications, however, they may not be able to apply according to the user’s specifications (special specification).

In this case, consult our personnel in charge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.3.1)</td>
<td>Intelligent display=Japanese</td>
<td>If Japanese is desired, designate it.</td>
<td>[ ] Yes [X] No</td>
</tr>
</tbody>
</table>

(Standard is in English.)

10.3.2) PC optional devices

a) KEYBOARD
   (Designate the display language.) English
   [X] Yes [ ] No

b) FLOPPY DISK DRIVE
   (USB connection specification)
   [ ] Yes [X] No

c) CD—ROM DRIVE
   (USB connection specification)
   [X] Yes [ ] No

d) USB correspondence memory (64 MB and above)
   (USB connection specification)
   [X] Yes [ ] No

10.3.3) Non-SI unit display

   Displaying both non-SI unit and SI unit is not allowed.
   [ ] Yes [X] No
# 10.4 Optional specifications (related accessories)

The following is prepared for variation specifications, however, they may not be able to apply according to the contents.

In this case, consult our personnel in charge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.4.1) Standard tools</td>
<td>Attached to No. 1 machine as standard. Not attached to No. 2 machine and after that.</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td>10.4.2) Instruction manual</td>
<td>CD-ROM (PDF format)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>※Not attached as standard.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japanese: 0</td>
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<tr>
<td></td>
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<td>English: 1</td>
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<tr>
<td></td>
<td></td>
<td>※1: Fill in the number of the required sum totals.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>※2: Another application software (for PDF) is required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>※3: If printed one (user shall bear the cost) is required,</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>consult our business personnel in charge.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paper(hard copy)</td>
<td></td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Japanese: 0 pcs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>English: 2 pcs</td>
<td>Normal paper</td>
</tr>
<tr>
<td></td>
<td>10.4.3) Ladder diagram</td>
<td>CD-ROM (PDF format)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>※Not attached to the standard machine.</td>
<td></td>
</tr>
</tbody>
</table>
### 10.5 Optional specifications (programming tool)

The following are prepared as the programming tool. Consult our personnel in charge for the contents.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5.1)</td>
<td>The programming console for CS1</td>
<td>Programming console (C200H-PRO27)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cable for above item (CS1W-CN624)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Key sheet for above item (CS1W-KS001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>※Designate whether Japanese or English.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support software for CS1</td>
<td>CX-Programmer(WS02-CXPC1-JV3)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommended operation environment ※1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPU: Pentium 133MHz or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OS: Windows 95/98/2000/XP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Windows NT Ver.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RAM: 64MB or more (256MB recommended)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard disk availability: 100MB or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor: SVGA (800 × 600 pixel) or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD-ROM drive: one</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support software for MP2300</td>
<td>MPE720(CPMC-MPE770)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommended operation environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPU: Pentium 800MHz or more (1GHz recommended)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OS: Windows 2000 SP1 or more / Vista / 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RAM: 128MB or more (256MB recommended)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard disk availability: 200MB or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor: XGA (1024 × 768 pixel) or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Color (16bit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD-ROM drive: one</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Software for servo amplifier communication</td>
<td>SigmaWin+(JZSP-WP002)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommended operation environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPU: Pentium 200MHz or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OS: Windows 95/98/ME/2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Windows NT Ver.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RAM: 64MB or more (96MB recommended)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard disk availability: 200MB or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor: SVGA (800 × 600 pixel) or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD-ROM drive: one</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital operator for Σ III</td>
<td>Digital operator (JJUSP-OP05A)</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>※ Although it is attached to the 1st machine as standard, it is not attached after 2nd machine.</td>
<td></td>
</tr>
</tbody>
</table>

※1 Consult us separately if the notebook type personal computer is required. TOWA handles supply Japanese one.

※If above tools for software are needed, check Yes or No when returning this specifications, or consult us. (If there is no check, we consider the tools are not needed.)
10.6 Optional specifications (related mechanism)

The following is prepared for variation specifications, however, they may not be able to apply according to the user’s specifications (special specification). In this case, consult our personnel in charge.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specification</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6.1)</td>
<td>Frame feed unit</td>
<td>The specifications are described in Section “8. Details of each part”.</td>
<td>No</td>
</tr>
<tr>
<td>10.6.2)</td>
<td>Frame preheater unit</td>
<td>The specifications are described in Section “8. Details of each part”.</td>
<td>Yes</td>
</tr>
<tr>
<td>10.6.3)</td>
<td>Loader dust collecting unit</td>
<td>The specifications are described in Section “8. Details of each part”.</td>
<td>No</td>
</tr>
<tr>
<td>10.6.4)</td>
<td>Press unit</td>
<td>Transfer ability 49.0 kN (50 tf) specifications.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

10.7 Optional specifications (ESD Specification)  
ESD: Electro Static Discharge

The ESD standard value is set to 50V for the part that a work (a product) directly makes contact.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.7.1)</td>
<td>There is a possibility that surge by static electricity causes the destruction of the semiconductor element. When the level of standard value or less is required, or the influence on the product is feared, additional action will be discussed separately including the countermeasure.</td>
</tr>
<tr>
<td>10.7.2)</td>
<td>When the product is transported from the contacted part, the contact static buildup is generated at each part though the optional ESD specification (standard value: 50V) is installed on the system. There is a possibility that the electric potential of 1kV or more is generated depending on conditions of humidity, parts contact and detachment speed, etc. When the influence on the product is feared, additional action will be discussed separately including the countermeasure.</td>
</tr>
</tbody>
</table>
### 11. User's specifications (special specifications)

The user’s specifications (special specifications) other than the standard and optional specifications of our machine.

If there is no descriptions below, the specifications of the machine will be the our standard specifications.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Contents of specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1</td>
<td>Remote controller</td>
<td>Basically, only one remote controller is required for each customer plant. for ion balance adjustment of bar type ionizer(SJ series)</td>
</tr>
<tr>
<td>11.2</td>
<td>LF PREHEATER (Change MICRO SENSBY)</td>
<td>Change the model for certification of CE marking.</td>
</tr>
<tr>
<td>11.3</td>
<td>Preheater mechanical clamp</td>
<td>It prevents the frame from the warpage at Preheater unit.</td>
</tr>
<tr>
<td>11.4</td>
<td>Flange installation on UL Cleaner</td>
<td>Flange installation on UL Cleaner for cleaner power up.</td>
</tr>
<tr>
<td>11.5</td>
<td>IN MAGAZINE orientation detection</td>
<td>MAGAZINE orientation check</td>
</tr>
<tr>
<td>11.6</td>
<td>Frame direction &amp; PKG type should be detect by Vision</td>
<td>Conduct LF package and orientation check by analysing hole or fiducial mark or character with the camera. Camera setting position is on IN FEED unit.</td>
</tr>
<tr>
<td>11.7</td>
<td>Installation of handy bar code reader on MASTER module front cover (Model No. AT20Q–SM)</td>
<td>The handy bar code reader is installed to read the bar code</td>
</tr>
<tr>
<td>11.9</td>
<td>Special Press Door for Failure Prevention of Safety Switch</td>
<td>Safety switch is built into Press Front Door for Failure Prevention.</td>
</tr>
<tr>
<td>11.10</td>
<td>Out carrier pallet cleaner</td>
<td>The cleaner collects the dusts on the top surface of Out Carrier Pallet. Cleaner head(Duct &amp; Brush) moves up and down by Cylinder. Cleaner head is provided by KIT.</td>
</tr>
<tr>
<td>No.</td>
<td>Item</td>
<td>Contents of specifications</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11.11</td>
<td>LF mis-position detection on Out Carrier Pallet</td>
<td>Thru-beam sensors are installed on Out Carrier Pallet. These sensors can detect the situation that the frames aren’t placed properly in the area surrounded by LF Guides.</td>
</tr>
</tbody>
</table>
| 11.12| External cull with full detection                                    | 1. Cull box relocate to outside machine. Cull box volume is 70L.  
2. Sensor is installed for full detection. sensor type : beam sensor |
| 11.12| OUT MAGAZINE orientation detection                                   | MAGAZINE orientation check (KIT specification)                                           |
| 11.13| Changing the safety switches for the double doors (Master & Out Module) | For the safety improvement, change the safety switches for the double doors.  
The double doors are at Left side cover (Master Cover), Right side cover (Out Cover).  
Finally, two safety switches with Lock Function are installed at each double door. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Contents of specifications</th>
</tr>
</thead>
</table>

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12. Type change

Type change can be available unless object L/F, tablet, or feeding / containing magazine is out of basic specifications of the machine.

1) Changing time

Only the skilled personnel in the machine, maintenance personnel, or personnel trained as specified by us can perform type change.
Tools, parts, and necessary data for the type change shall be prepared.
(It takes more time according to the optional specifications and user’s specifications.)

- Mechanical section
  Approx. 30 minutes
  (The following are excluded:
  • In the case that the magazine shape changes greatly
  • In the case that the gate break method changes
  • In the case that the type changing parts is added by user’s specifications (special specifications)
  • In the case that the cleaner brush unit exchanges.

- Data change
  Approx. 5 minutes
  • Molding condition
  • Type data (Die layout, work, magazine size, and so on)
  (Changing the servo data will be performed automatically by inputting above data.)

Up to 30 type data can be stored.
Storing data facilitates the data change.
13. Acceptance criteria
The product will be judged acceptable when the following criteria are met:
1) The product conforms to the final specifications sheet.
2) The items included on the mutually signed memorandum are satisfied.
3) An up-time of 95% or better is attained for a 2 hour running period.

14. Limited warranty
The following press parts are guaranteed for a five-year period, and other parts are guaranteed for a one-year period, starting from the date of the job completion report or incoming inspection confirmation sheet. Any defects and/or malfunctions which occur during the period of warranty will be repaired and/or defective parts will be replaced free of charge as soon as possible, if and only if the defects and/or malfunctions have been caused by our design and/or manufacturing problems.
- (Slide, upper, lower) platen
- Links (A, B, C)
- Stand
- Link support
- Holder block
- Link block
- Slider
- Tie bar
- Pins (1, 2, 3)
However, if the bushing section is damaged, the warranty period shall be one year.

TOWA Corporation offers the same service for parts or products attached to or mounted in the machine, which are not manufactured by TOWA Corporation; however, this service is limited to the specific warranty period of each part or product.
The warranty period of the dry-pump is 1 year or 3000 hours of operation time whichever is earlier.

The following cases will not be covered under the warranty so the customer will be charged for service and/or parts, even during the period of warranty:
1) Parts designated by TOWA Corporation as consumption articles (parts that are subject to normal wear and tear).
2) Damage or malfunction due to misuse, improper repair or modification by the customer.
3) Damage or malfunction caused by the customer’s failure to perform maintenance, inspection and lubrication as specified in the instruction manuals.
4) Damage due to falling or dropping during transport by the customer.
5) Damage caused by fire, earthquake, flood, lightning, or other natural disasters.
6) Damage caused, under abnormal circumstances, by the use of substances such as organic solvents or corrosive gases, etc., or by the use of strong magnetic fields, etc.
7) Damage caused by abnormalities of voltage, hydraulic pressure, water pressure, and/or pneumatic pressure.
8) Other damage or malfunction deemed to be the responsibility of the customer.
9) Damage or malfunction of the parts due to the constituents which come from the molding materials (resins, substrate, etc), releasing film, and pre–tape.
10) Damage or malfunction when works (substrate, resin, magazine, etc) not within the tolerance specified in the customer specification are used.
11) Damage or malfunction due to additions or/and modifications of the software or/and hardware without prior approval of TOWA Corporation.

Make sure to have made back–ups of data and taken any other related measures in advance, as there exists the possibility of losing previously stored data during repair work or replacement of parts.
15. Final specifications

1) Any changes in specifications written in a mutually signed memorandum are valid.
2) Items to be added to the specifications will require additional charges.

16. System specifications

1) We request that the customer understand and observe the specifications as outlined in “BASIC SPECIFICATIONS” and “UTILITY REQUIREMENTS”, in order to warrant up-time, production capacity and quality.
2) Criteria for system acceptance are the standards outlined above. Any other criteria to be included must be quoted separately.
3) Please alert us as soon as possible if it becomes necessary to consider changing utility requirements, products to be packaged, or quality inspection standards.
4) If you received a notice from a third party regarding the proprietary infringement of their product installed in our system, we will take the responsibility in settling the matter unless it is based on your procurement specifications or your instruction.

17. After sales service

TOWA supplies charged maintenance parts for 7 years after the end-of-sale announcement of each equipment. (Please refer to TOWA website)

Therefore, we would like to discuss for each case regarding maintenance service and modification work of equipment which passed over 7 years from its end-of-sale.
In case purchased parts become discontinued before 7 years from their end-of-sale, TOWA would try our best to support by installing alternative parts (including redesigning) and repairing current parts.
However, some cases cannot be solved by beforementioned method, and we would like to discuss each time with customers for those cases.

※The appearance, specifications, etc., are subject to change without notice due to improvement of the product.