

1. SPECIFICATIONS

1. SPECIFICATIONS

1.1 SPECIFICATIONS

See the next page for SPECIFICATIONS of your press.



CAUTION Use the press in the ambient temperature range of 5 to 40° C (41 to 104° F). The range of allowable relative humidity is 45 to 85 %.

If the ambient temperature is lower than this temperature range, difficulty in starting the machine, deterioration of performance of the clutch/brake due to icing on the solenoid valve muffler, or other troubles may occur. If the ambient temperature is higher than this temperature range, deterioration of performance of the clutch/brake, galling of the bearing surfaces, or other troubles may occur.

When it is anticipated that the ambient temperature exceeds this temperature range, contact AIDA Service Station shown on the last page of this instruction manual.



NOTE Die height means the distance between the bottom face of the slide and the top face of the bolster at bottom dead center with the slide adjusted to the highest position.

General

This press line consists of a destack feeder and a transfer press, and it is used for transfer processing using blanks.

Component machines of press line

Destack feeder	VF-5570
Press	TMX-S2-1200(2)-420-150(A)
Transfer feeder	TSS-60R (Servo transfer feeder)

Specifications of press line

Material of blank	JIS SPCC, SPHC, SAPH, and SUS410L (Magnetic substance)
	Yield stress 25 to 60 kgf/mm ² or equivalent
Dimensions of blank: L.R × F.B	550 × 700 max. mm
	150 × 150 min. mm
	For material of 0.4 mm thick, the blanks of the maximum dimensions are of a rectangular shape of 400 × 620 mm
Thickness of blank	0.4, 0.5 to 5.0 mm
	(The function of double-blank detection is not guaranteed for material thinner than 0.5 mm)
Shape of blank	Sheet and special shape
Blank stack height	700 (Guide post type) mm
Blank stack weight	1900 max. kgf/stack
Blank transferable weight	8 max kgf/blank
Feed direction	Left to right
Press capacity	1200 tf
* Number of line strokes under no-load	10 to 25 spm

* The optimum transfer speed varies depending on the shape, thickness, material, and conditions of transfer of the blanks.

The transfer speed of bent blanks, blanks having holes, blanks of special shape will be separately discussed, and the transfer speed or the blanks are transferable or not will be determined

Automatic die change controller

MARK IV (A)

The particulars of the automatic die change controller incorporated in this press line are as follows:

Operation system

This is an automatic die change system in which the dies used for the completed work are carried out and the dies to be used for the next production are carried in automatically by depressing the setup button. The production data of the dies to be used for the next production are set separately from the present production using the dies for the present production.

However, this automatic die change function is usable when two moving bolsters are provided. Because one moving bolster is provided in this press, the above mentioned function is realized when another moving bolster is added later. The control system is adaptable to the automatic die change system mentioned above.

In the one moving bolster configuration, removal and installation of the dies after carrying out the bolster are required.

Data to be set The following data are set.

Number of products

Die height

Feed stroke

Selection out of 2

Feed bar inside distance

Selection out of 3

Selection of upper die clamper

(Selection for use among 7 processes)

Setting of balancer pressure

Selection of die cushion to be used

Setting of die cushion pressure

Setting of timing switches for automation

Right and left positions of double-blank detector

Setting of material thickness for double-blank detection

Selection of blank table, large or small

Selection of lift cylinder head

△ Die change height (Adjustment 0~50mm)

Setting up operation button

Production ending button

Button for ending production before reaching the preset number of products without leaving workpieces in the dies

Bolster selector button

Button for selecting carry-out, carry-in, or carry-out → carry-in (die change)

Start button

Button for starting automatic die change

Die preparation button

Button for making sure that the dies for the next production are ready.

Note: Upper die is supported by a floating system by urethane rubber or the like on the lower die top face.

Automatic operations

The following die changing operations, including those which are performed in accordance with the set data, are performed automatically.

- (1) Connection/disconnection of feed bars
- (2) Connection/disconnection of misgrip connector set
- (3) Selection of feed stroke
- (4) Selection of feed bar inside distance
- (5) Adjustment of die height (stored using a urethane block)
- (6) Selection of upper die clamber (for 7th stage)
- (7) Selection of upper die clamber, clamping and unclamping, and advancing and returning
- (8) Clamping and unclamping of bolster
- (9) Lowering and raising of die cushion when changing moving bolster
- (10) Up and down of guards
- (11) Changing bolster
- (12) Automatic connection of automation equipment
- (13) Selection of balancer pressure
- (14) Selection of die cushion pressure
- (15) Selection of floater base
- (16) Adjustment of position in the R-L direction of double-blank detector
- (17) Selection of setting of blank thickness of double-blank detector
- (18) Selection of large or small of blank table
- (19) Adjustment of position of product taking out conveyor in the feed direction
- (20) Open/close of covers of scrap chute on the floor
- (21) Selection of lift cylinder head
- △ (22) Adjustment of die change height (Adjustment 0~50mm)

Manual operations, and items to be checked by operator

- (1) Setting of main motor micro speed at the time of start of automatic setup (Inside setup)
- (2) Fine adjustment of fingers (as required)
- (3) Connection/disconnection of hoses for automation (Outside setup)
- (4) Tightening of lower die common plate (Outside setup)
- (5) Replacement of cup handle of destack cylinder (as required)
- (6) Adjustment of position of transfer cup (as required)
- (7) Adjustment of position of grip jaw (Inside setup)
- (8) Setting of floater base
- (9) Open/close of covers of scrap hopper on the top face of moving bolster at the front and rear portion (Outside setup)
- (10) Changeover of stack magazine (shuttle car), change over of floater plate, and check of the position of double-blank detector by means of operation of stack lift and blank pickup. (First time only)
- (11) Check the agreement between set data and actual state after completion of adjustment
- (12) Cleaning of top face of moving bolster rails
- (13) Adjustment of position of post for positioning the stacked blanks post
- (14) Setting of blank stacking and stacking completion button
- (15) Others

Press specifications

Type	Two-suspension-point, crank motion press		
Model	TMX-S2-1200(2)-420-150 MARK IV(A)		
Load capacity	Total:	1200	tf
	Upstream side	700	tf
	Downstream side	500	tf
Load capacity on each stage	400		tf
Rated tonnage point	13		mm
Slide stroke length	650		mm
Continuous working energy	30000 at 12 spm		kgf.m
Number of continuous strokes under no load	10 to 25 (3 dimensions)		
	spm		
Number of intermittent strokes	The press speed when transferring blanks of special shape will be discussed and determined separately.		
	4 at 15 spm		
Microinching	Approx. 5		spm
Die height	1150		mm
Slide adjustment	300		mm
Slide area: L.R × F.B	4200 × 1500		mm
Bolster area: L.R × F.B	4200 × 1500		mm
Bolster height	600		mm
Height of bolster top face above floor	610		mm
Number of stages	7, 9 (1 st stage in the same position)		
Distance between stages	600, 450		mm
Drawing depth: 3-dimension:	180 max.		
	mm		
Capacity of balancer	See TIMING DIAGRAM (which will be submitted separately) for details		
	10 (Air pressure 8 kgf/cm ²)		tf
Main motor	185 (Inverter control)		kW
Power source	415 V, 3-phase, 3-wire, 50 Hz		
	240 V, single phase, 2-wire, 50 Hz		
Voltage of main motor	415 V		
Voltage of other motors	415 V (Certain motors are 200 V rating, and power is stepped down by transformer provided by AIDA.),		
Voltage of control circuit	24 VDC		
Ambient temperature	5 to 40		°C
Required shop air pressure	5		kgf/cm ²
Overall height above floor	Approx. 8680		mm

As to the number of strokes per minute and depth of drawing, the conditions will be determined later when detailed conditions for operation are discussed.

Die cushion specifications

Type	Pneumatic, one pad one cylinders Installed at the position of 600 mm feed pitch	
Capacity: 1 st , 2 nd stages	12 to 50	tf
3 rd stage	4 to 15	tf
Number of die cushion	3	
With quick exhaust device		
Stroke length	180	mm
Pad area: L.R × F.B	450 × 700	mm
Distance between bolster top face and pad top face:	250	mm
Die cushion pin hole bushing	OILESS bushing is inserted 1 set into cushion pin hole on bolster See the drawings for details.	

Note: Air pressure is increased to 8 kgf/cm² booster valve.

Cushion pins with head will be provided by the user.

Transfer feeder specifications

Type	TSS-60R (Driven by a.c. servomotor)	
Feed stroke	600, 450	mm
	(1 st stage in the same position)	
Clamp stroke, one side	230	mm
Lift stroke	150	mm
Feed bar inside distance	800, 1000, 1200	mm
	(Feed bar maximum inside distance is 1660 mm in an unclamp state)	
Feed direction	From left to right	
Height of feed bar top face	600 above bolster in down position	mm
Height of blank feed line	650 above bolster	mm
Feed bar sectional area: W × H	160 × 170	mm
Transferable weight	150 kgf or less including fingers and finger plate	

Destack feeder specifications

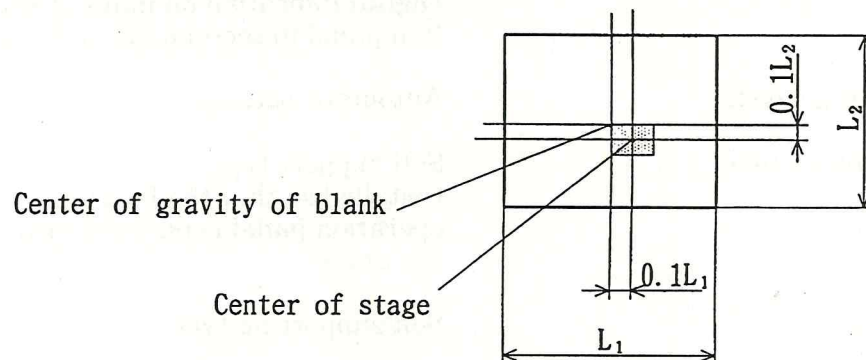
Type	Vacuum pickup, shuttle car type Stack guide post type	
Model	VF-5570	
Number of blank stacking stages	1 stack/magazine	2
Blank transfer method	Fingerless intermediate transfer device VII	1
Blank stacking method	Crane and manual operation Prepared by the user	
- Height of blank feed line	650 above bolster	mm

Accessories of destack feeder

Blank lifting device	Hydraulically driven Definite number of blanks are lifted Selective head type	1
Definite number of blanks holding device	Kneel type holding device (Combined with magnetic separator) Attached to floater base	1
Floater base pull-out device	Pull-out by motor Pull-out in the front-rear direction Two different shapes of floater bases is provided.	1
Floater base clamper	Automatic clamp type	1
Double-blank separator	Magnetic separator	1
Double-blank detector	Magnetic scale type, digital indication	1
Double-blank detector position adjusting device	Automatic movement in the direction of right-left (Manual movement in the direction of front-rear)	1
Double-blank removing device	Chute opening type with bucket	1
Destack cylinder	Air cylinder up/down type Cup bracket change type	1
Spare vacuum cup		10
Lift cylinder head selector	Changeover, large or small	1

NOTES:

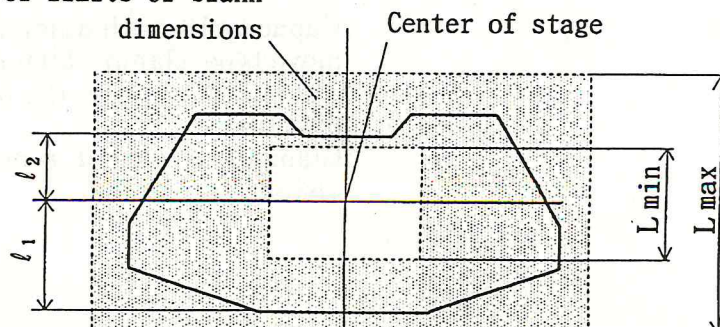
- (1) Blanks of magnetic material only can be used.
- (2) The maximum feed speed of blanks of a special shape will be examined by AIDA, and determined through discussion with the user.
- (3) When stable separation of blanks by the magnetic floater can not be achieved due to oil for rolling or presswork remaining on the surfaces of the blanks, provide suitable means to facilitate separation. For example, provide an upward protrusion on the blanks to ensure separation. (The protrusion must be located in the place where it does not affect the transfer.)
- (4) The optimum number of feed strokes per minute of this unit depends on the shape, thickness, material of the blanks and other factors. Therefore, there is a case where the maximum feed strokes per minute (spm) cannot be applied to the workpieces. There may be a case where excessively warped blanks can not be fed.
- (5) Floater plates peculiar to each blank shape are required. Two floater bases, which are fabricated by AIDA to match the shapes of blanks provided by the user of the press, are provided.
- (6) Off-center of the center of gravity of the blank from the center of the stage shall be within the range shown below. The range is figured by multiplying L_1 and L_2 (dimensions of blank) by 0.1 on one side.
If the off-center exceeds the range, stable feed will not be performed.



- (7) The maximum dimension L_{max} and the minimum dimension L_{min} of blanks shall be twice the distance of the blank edges from the center of the stage both in the direction of left-right and front-back. In the figure shown below, the area of $L_{max} \geq 2 \times l_1$ and $L_{min} \leq 2 \times l_2$ is shown and it does not show the blank contour itself. Do not make a hole or a notch within the area of the minimum dimension of the specification.

Particular attention should be paid when blanks of a special shape are used.

Area of limits of blank dimensions



Major units and components

Variable speed drive unit	Driven by variable speed main motor with regenerative braking	.1
Main motor automatic acceleration and deceleration device	When starting the continuous operation, the press operation starts at slow speed	1
Reversing device	At the time of microinching	1
Microinching	Low speed rotation of main motor Not capable of trial stamping	1
Automatic die change control system	MARK IV (A) Data of dies for the next production are set	1
Operation monitoring device	Display type (Indication in English)	.1
Flywheel brake	Interlocked with main motor Stop time is 30 seconds or less.	1
Crank angle indicator	Electrical type (Press and feeder)	1 each
Die height indicator	Digital indication on main operation panel in increments of 0.1 mm	1
Slide adjusting device	Automatic setting	1
Main operation panel	Self-support type Installed so that the face of operation panel is parallel with the press.	1
Control enclosure	Self supporting type	1
Bottom dead center indicating lamp	In main operation panel	1
Preset position stop device		1
Load meter	Digital indication Indicates loads right portion, left portion, and the total With work load upper limit setting function	1
Upper die clamber	Capacity:10, with automatic move type, clamp 50 mm Automatic travel in the front-back direction Clamber movement minimum inside distance is 800 mm	14 pcs

	Use or no use of clamper at 7 th process is selectable	
Moving bolster	Capacity: 20 tf Front side travel type Pull out distance 5500mm Traveling speed Approx. 12 m/min MB rail guide is a convex type. MB rail for the front side travel only is provided, and that for back side travel can be installed later. The control system can additionally be installed. Step type scrap hopper is attached to the bolster at the front and rear faces. (Manual opening/closing type cover)	1
Bolster clamper	Capacity 10 tf	1 set
Pad lower limit detector	Used for die cushion	1
Quick exhaust device	Used for die cushion	1
Move-up delay circuit	Used for die cushion	1
Air pressure digital setting device	Used for die cushion and balancer	1 set
Lubrication system	Forced circulation lubrication With flow indicator Provided with magnetic switch (for crown only) (Indicated by lamps on main operation panel) Oil tank is installed in the pit. Oil servicing port is located above FL. With oil level detector Automatic intermittent lubrication Motor driven	1
Oil collector around bed		1
Feed bar independent drive	Push button type	1
Feed bar connection/disconnection device	Automatic connection of disconnected feed bars Middle section of feed bars are carried out together with moving bolster	1
Feed bar retraction device	Manual type	1
Feed stroke selector	Selection out of 2 kinds	1

12100-0993e		
Feed bar inside distance adjusting device	Selection out of 3 kinds	1
Manual unclamping device	Push button type, for feed bar	1
Feed bar	The section to be carried out together with moving bolster	1 set
Threaded hole on feed bar		1
Intermediate transfer unit	Model V II, fingerless type	1
Blank table	Changeover, large/small	1
Operation stand	Two-hand trip system, with cable 3 m	1
Timing switch	Digital type, spare 4 units (Made by AIDA) Digital type 4 units for automation	1 set
Number of products counter	Resettable type, 6-digit Installed on main operation panel	1
Count-up counter	Preset type, 6-digit Installed on main operation panel	1
Maintenance counter	7-digit type, installed inside control enclosure	1
Emergency stop button	Self latching type On each column, destack section, operation stand, each operation panel, product taking out section	12
Overrun monitor		1
Barrier guard	Motor driven type, the front and rear sides Fixed cover on side opening portion	1
Warning light on the top of press	Always lighting type Interlocked with ladder interlock	4
Caution light	Installed on destack feeder side (for changeover of shuttle car)	1
Ladder interlock		1
Die block	Made of FRP. Δ 700 580mm long On right front and left rear column	2
Receptacle, plug	For die block On right front and left rear columns	2

12100-0993e Buzzer, melody horn	On right side of press, at front and rear Used for giving warning and giving sign of travel of moving bolster, and giving sign when moving up and down guard	2	
Die room illuminating lamp	On inside of right left, front rear columns	4	
Work area illuminating lamp	Mercury-arc lamp 2 each outside the front and rear sides, 1 on product taking out side, 1 on destack side	5	△
Deck, ladder, and handrail	Height of handrail 1200 mm	1 set	
Overload protector	Hydraulic type, slide suspension point	1	
Pressure switch	For balancer, clutch, lubricating oil and others	1 set	
Clutch/brake solenoid valve	Made by ROSS, double-valve type	1	
Misgrip detecting switch For 600 mm feed	Limit switch type Front side: 1 idle, 1 st thru 7 th processes	1 set 2 each	
For 450 mm feed	Rear side: 6 th and 7 th processes Front side: 1 idle, 2 nd thru 9 th processes Rear side: Not required	1 each 1 each	
Misgrip indicator lamp	Installed on right front column Including double-blank transfer indicating lamp for 2 nd and subsequent processes	1 set	
Misgrip receptacle connecting device	Automatic connection to aggregated receptacle	1	
Feed monitor	Circuit for operation without blank on certain stages	1 set	
Feed bar protector	Servomotor overload detection system	1	
Double-blank detection press stop changeover switch	Changeover between continuous operation OK or not by actuation of feed monitor to prevent stamping without blank	1	

12100-0993e Receptacle and plug	240 V, single phase, 2-wire 3P (with grounding) Less than 20 A in total On right front and rear columns (2 each) On crown, under bed (1 each)	6
Air outlet	1/2B, on each column, 1 each	4
Automation equipment	1/2B, with pressure reducing valve Automatic connection when bolster is set in the bolster home position Connectors (female side joints) are provided on bolster up stream and down stream sides, at the front and rear portions, 1 each	4 sets
Product carry-out conveyor	Width fixed to 500 mm Side guide 600 mm wide Length adjustable, 100, 570mm Made of synthetic fabric	1
Scrap chute, front and rear of bed	Chute cover, from the floor to the top of scrap conveyor, is automatically opened and closed as the guard moves.	1
Blank oil coating device	Single system type Made by NANSHIN-KIKO. Nozzle selectable Dripping frequency and delivery quantity are adjustable Oil is applied to the top and bottom faces With oil pan Height of lower nozzle is 620 mm above bolster	1
Standard tools		1
Anchor bolt	With nuts, washers, shim plates	1 set
Booster valve		1
Sequencer	Made by MITSUBISHI ELECTRIC	1
Spare parts	For 4000H run, including personal computer loader (with specifications in English)	1
Vibration absorber	Made by MITSUBISHI STEEL, MAV	1

Special equipment

Conformity with EC Machine Directive CE Marking will be able to be affixed.

Compatibility with EMC Directive Conforms to the requirements concerning radiation of electromagnetic wave

Note: To comply with the above-mentioned two regulations, there may be cases where the equipment specified in the specification cannot be used or change of a part of the specifications is required.

Selection of operation

Any operation mode among the "OFF", "MICRO", "INCH" (Inching), "SINGLE", and "CONTINUOUS" can be selected by use of operation selector switch on the operation panel. Preset stop position is $\Delta 270^\circ$ ~~90°~~ of crankshaft angle.

The "INCH" and "SINGLE" mode operations are possible at 10 to 18 spm of continuous operation under no load.

Accuracy

- The degree of straightness and parallelism conform to AIDA(JIS B 6402-1977) Grade 1.
- The overall clearance top and bottom of connector parts conforms to JIS B 6402 Special Grade, crankless type.
- Perpendicularity and offset conform to AIDA standard.

UNIT : mm

Straightness of slide and bolster		0.21 or less
Parallelism between slide and bolster	At bottom dead center	0.43 or less
	At the half of stroke	0.86 or less
Perpendicularity of slide movement to bolster top face	At the lower half of stroke length	0.18 or less
Overall clearance between top and bottom of connector parts	At bottom dead center	2.45 or less
Offset		1.0 or less

Model TMX-S2-1200(2)-420-150(A) Serial No. 12100-0993

Stroke length: 650 mm

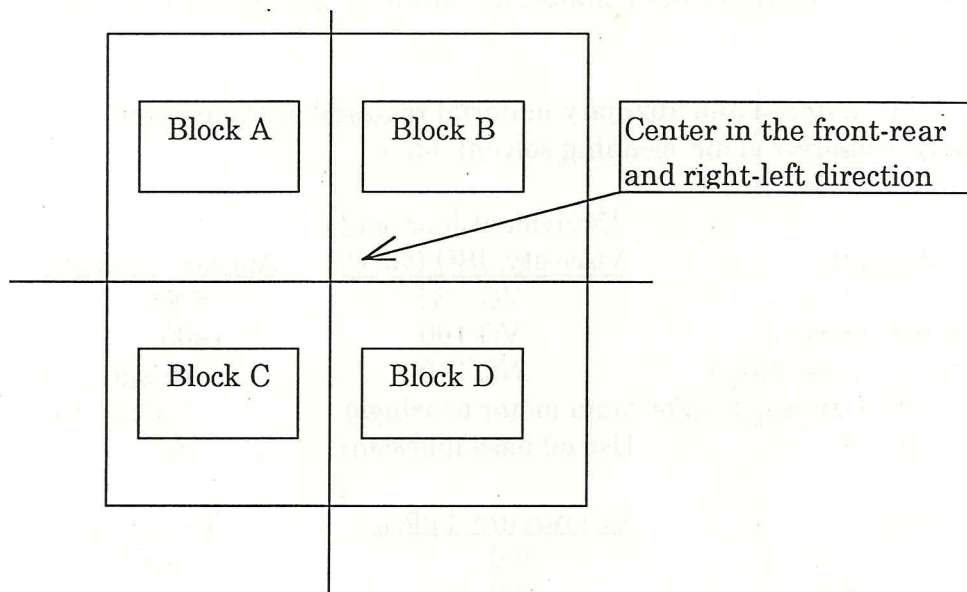
PRECAUTIONS WHEN USING DIE CUSHION

Always follow the instruction mentioned bellow to assure a long term use of the die cushions without a trouble.

Note that the number of cushion pins mentioned here is the minimum. Determine the number of the cushion pins to be appropriate to your working conditions.

- (1) Assume that the die cushion pad area is divided into four blocks-A, B, C and D- as shown below. Then, arrange the die cushion pins so that each block has at least one die cushion pin. At least four cushion pins are required on one cushion pad.

PLAN VIEW OF CUSHION PAD



- (2) In case where the cushion pins cannot be arranged on all the blocks because the die is too small, arrange a killer on the block on which a cushion pin can not be arranged to safety the requirement in paragraph (1) above.

Scope of customer's responsibility

- (1) Work to supply electric power to the control enclosure. (Wiring between the press and control enclosure (up to 10 meters) is performed at AIDA.)
- (2) The primary air piping outside the machine.
- (3) Design and execution of foundation. AIDA submits drawings of the dimensions of the foundation.
- (4) The primary side electric power supply work based on applicable regulations and codes
- (5) Manufacture and installation of sole plates or leveling plates to be placed on the foundation.
- (6) Lubricating oil, hydraulic fluid, material coating oil, and grease required at the time of installation.
- (7) Consumable material and auxiliary material required at the time of installation (such as electricity, compressed air, cleaning solvent, etc.).

<u>Kind of lubricants</u>	<u>Equivalent lubricants Viscosity, ISO (40° C)</u>	<u>Approx. quantity. L</u>
AIDA Standard Oil No. 1	VG 32	600
AIDA Standard Oil No. 3	VG 100	1200
AIDA Standard Grease No. 0	NLGI-0	16 kgf, 1 can
SHELL ALVANIA grease 2 (For main motor bearings)		2.5 kgf, 1 can
Material coating oil	Use oil base lubricant	100

<u>Initial air charge</u>	<u>Air pressure, kgf/cm²</u>	<u>Volume, L</u>
Balancer	8.0	6200
Die cushion (50 tf × 2)	8.0	1800
Die cushion (15 tf × 1)	8.0	300
Charge tank	8.0	950
Destack feeder	5.0	20
Others	5.0	200

<u>Air consumption</u>	<u>Air pressure, kgf/cm²</u>	<u>L/min</u>
Destack feeder Operation at 25 spm	5.0	Approx. 220

NOTE: Air consumption of automation equipment is not included.
Air pressure is boosted up to 9 kgf/cm² by air booster valve.

Painting

The color of exterior surface finish coat will be as specified by the purchaser.

The interior surfaces and electric components will be finished to AIDA standard colors.

Test run and acceptance

Test run will be carried out at AIDA 's plant in the presence of representatives of your company.

Acceptance conditions will be discussed and determined separately.

Warranty

~~△ The "TERMS AND CONDITIONS" attached to the agreement applies.~~

WARRANTY AND AFTER-SALES SERVICE1. WARRANTY PERIOD

The product shall be warranted for twelve (12) months from the date of acceptance by you. When the product is not accepted soon after the installation, it shall be warranted for thirteen (13) months from the date of shipment.

2. WARRANTY

The company shall warrant the following:

- 1) The company shall warrant the specified performance during the warranty period provided that the product is correctly operated within the range of the specifications and properly maintained.
- 2) If a malfunction or defect of the product attributable to the company occurs during the warranty period, the company shall adjust and/or repair or replace its parts promptly without charge.

3. THE WARRANTY DOES NOT EXTEND COVERAGE IN THE FOLLOWING CASES:

- 1) The company is not liable for direct or indirect damages to your company or third party caused by production failure due to malfunction or defect of the product.
- 2) Malfunction or defect caused by operation of the product beyond the range of specifications.
- 3) Malfunction or defect caused by use not in accordance with the applicable instruction manuals and notes, or by improper maintenance.
- 4) Items subject to service life even under normal operation such as lubricating oil and vendor parts.
- 5) Malfunction or defects, resulting from improper operation.
- 6) Malfunction or defects, caused by modification, retrofit, or relocation from the initial site of installation of the product.
- 7) Secondary damage or loss, such as damage to materials or products other than this product or personal injury.
- 8) Damages due to force majeure such as Fire, Earthquake, Flood, and other calamities.

4. AFTER-SALE SERVICE

If a malfunction or defect of the product occurs after the warranty expiration date or if that is beyond the scope of the warranty, the product shall be adjusted and/or repaired, or the appropriate parts shall be replaced, at customer expense, in accordance with a separate arrangement.

Applicable standards

- | | |
|---|--|
| (1) Unit: | Metric system |
| (2) Design general: | JIS, EC Machine Directive, EMC Directive |
| (3) Pneumatic and hydraulic systems: | JIS, EC Machine Directive |
| (4) Pressure vessel: | UK Standard |
| (5) Piping : | JIS |
| (6) Thread . | ISO, JIS, |
| (7) Material: | JIS |
| (8) Electric: | JIS, EC Machine Directive, EMC Directive |
| (9) Inspection: | AIDA Standards, JIS |
| (10) Symbols used in the Instruction Manual: | JIS |
| (11) Packing: | JIS |
| (12) Painting: | AIDA Standards |
| (13) Nameplates and instruction plates | In English |
| (14) Spare wire numbers are assigned to spare electric wires. | |

Among requirements prescribed in the standards mentioned above, only those which are usually applicable to design and manufacture, and available by usual purchase means will be applied.

System operational specifications

UNIPART YUTAKA SYSTEMS.

Component devices

<u>Line configuration</u>	<u>Serial No.</u>	<u>Model</u>
Press	12100-0993	TMX~S2~1200 MARK IV(A)
Transfer feeder	12101-0993	TSS-60R
Destack feeder	12102-0993	VF-5570

Contents

1. Line configuration
2. Stop function and types of line stop
3. Table of interlocks for safety protection devices
4. Operational modes of the line
5. Procedure for die change operation

(Attached material)

GUARD INTERLOCK LAYOUTDWG No.109-29579
TMX/FLOW CHARTDWG No.109-29656
LAYOUT.....DWG No.203-20640
TMX/O.P.LAYOUTDWG No.103-14656,103-14643,335-13651
335-13653,335-13652,335-13853
335-13923
TSS/O.P LAYOUTDWG No.203-20492
TSS/PORTABLE ASSY.....DWG No.335-13265
VF /O.P.LAYOUT.....DWG No.103-14655
VF /SUB O.P.LAYOUT.....DWG No.435-15587,435-15588,435-15589

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1. Line configuration

1.1 Brief explanation of the line

This press line consists of destack feeder and transfer press, and it is a machine to transfer press on the blank material.

This machine is applicable to Machine Directive Article 4, Paragraph 2, and this machine cannot be operated unless appropriate safeguarding had been implemented by the customer in advance according to the laws and regulations in advance based on the estimated danger level of the press line and the machine.

Operational positions and protection positions of the press line are shown on the attached guard interlock layout drawing (109-29354 Z-7003).

The guard interlock layout drawing gives the two views, front and rear the moving bolsters.

However, the press is installed without the backward moving bolster according to your request.

1.2 Operational positions

Operational positions for this press line are as listed below.

- (1) Press operation panel
- (2) Press auxiliary operation stand
- (3) Transfer feeder operation stand
- (4) Destack feeder operation stand
- (5) Press operating stand
- (6) Destack feeder sub operation panel (2 locations)
- (7) Transfer feeder portable

1.3 Installation locations for emergency stop button and top stop buttons

(1) Installation locations for emergency stop buttons (total 12 locations)

Press Each column (press operation panel, left front, right rear, left rear), press auxiliary operation stand, product ejection side, press operating stand.

Transfer feeder Transfer feeder portable, transfer feeder operation stand.

Destack feeder Destack feeder operation stand, destack feeder sub operation panel (2 locations)

(2) Installation locations for top stop button (total 6 locations)

Press press operation, press auxiliary operation stand, product ejection side, press operating stand.

Transfer feeder Transfer feeder operation stand.

Destack feeder Destack feeder operation stand.

1.4 Installation location for die block (with plug) (total 2 locations).

- (1) Press Right front, left rear column.

1.5 Protection devices

- (1) Protection of the press machine front face is achieved by the interlocking guard (with reset button/mounted at right front column) with motor driven guard locking.
- (2) Protection of the press machine rear face is achieved by the interlocking guard (with reset button/mounted at right rear column) with motor driven guard locking.
- (3) Protection of the press machine right side is achieved by the interlocking guard (with separate reset button at front and rear/mounted at left right and rear column) with guard locking.
- (4) Protection of the press machine left side is achieved by the interlocking guard (with separate reset button at front and rear/mounted at left front and rear column) with guard locking.
- (5) The destack feeder (destack cylinder and lift cylinder) is safeguarded with an interlocking guard (the interlocking guard is provided with a reset button and installed on the (center) destack feeder guard).
- (6) The area inside the press right-side guard is safeguarded with mat sensors (the reset buttons respectively mounted on the right-side guard is shared with the front and rear sensors).
- (7) Intrusion detection device (with separate reset button at front and rear/mounted on right front and rear column) is equipped at press front and rear face.
- (8) Protection of destack feeder upper section (servo motor driving section) is achieved by ladder interlock.

1.6 Danger zone

Danger zones not protected by protection devices as described in paragraph 1.5 are shown in 1.6(1)~(3) below. It is expected that the customer estimate the danger level of the press line and component machines and implement appropriate safeguarding devices according to the laws and regulations prior to use of the machine.

- (1) Conveyor danger zone
Interlock terminal for conveyor sudden stop and press sudden stop (with terminal for reset button/mounted at press right side guard) is provided inside the product ejection side emergency stop button box.
- (2) Bolster danger zone
Interlock terminal for bolster run stop (with terminals for front, rear, left and right reset buttons/mounted on operation stand for right front, and at each column for other locations) is provided inside the right bed concentrated terminal box of the press.
- (3) An interlock terminal (with a reset button) to disable running of the stacking change truck and floater base is prepared inside the destack feeder operating stand.

1.7 Interlock terminals on your request

The press line is provided with interlock terminals given in 1.7 (1) and 1.7 (2) according to your request.

- (1) Interlock terminal for the front bolster bumper
An interlock terminal to disable running of the front bolster is prepared inside the terminal box of front bolster.
- (2) Interlock terminal for the rear bolster bumper
An interlock terminal to disable running of the rear bolster is prepared inside the terminal box of rear bolster.

1.8 Soundproof cases to be installed by you

The soundproof cases should be installed in such a way as not to hinder the operator at the operating locations shown in 1.2. For the safety devices given in 1.5 to 1.7, a reset button shall be installed while taking visibility into account so that the operator who presses the reset button is able to check to ascertain that no exposed person is present in the relevant danger zone.

2. Stop function and types of line stop

2.1 Press line component machines

This press line consists of the destack feeder and the transfer press, and control devices therefor are divided into three for the following machines.

- (1) Destack feeder
- (2) Transfer feeder
- (3) Press

Therefore, major interlocks among those machines are effective among (1)~(3) above.

2.2 Types of stop at transmission side

(1) Emergency stop

When emergency stop button of the applicable machine is pressed, emergency stop circuit to other machines is shut off.

(2) Sudden stop

This is a signal provided to stop some or all of other machines in the case of high emergency when error condition of a machine is detected.

It is used when immediate stop is necessary.

As sudden stop by safeguarding devices is described in paragraph 3 "Table of safeguarding devices interlocks", they are not included in this paragraph.

Typical stop types for each machine are described below.

- Destack feeder stuck blanks
- Transfer feeder asynchronism
- Press balancer pressure too low

(3) Cycle stop (or top stop)

When cycle stop button or top stop button of the applicable machine is pressed, cycle stop circuit to other machines is shut off.

This is a signal provided to stop some or all of other machines in the case of high emergency when error condition of a machine is detected.

It is used when stopping after moving to a position easier for restart.

Typical stop types for each machine are described below.

- Destack feeder no material is detected
- Transfer feeder cycle stop button
- Press prescribed number is counted up

2.3 Types of stop at receiving side

(1) Line emergency stop

Machine will stop at all modes, and no operation whatsoever can be made.

For restart of the machine, emergency stop must be reset first, then restart operation must be made.

Function of emergency stop is pursuant to stop category 0 or stop category 1 as described in paragraph 9.2.2 of EN60204.

Stop category 1 applies to intermediate transfer device driving or transfer feeder driving.

Other devices make category 0 stop.

(2) Sudden stop

Machine stops immediately in certain mode or all modes.

Transfer feeder, however, will make angle synchronizing control with the slide until the press slide stops, then stops.

For restart, the cause for stop must be removed and then restart operation must be made.

(3) Cycle stop (or top stop)

Machine stops after moving to the cycle end point or to the escape point.

For restart, restart operation is required.

2.4 Types of line stop

Transmission side device	Receiving side device	PRESS	TRANSFER FEEDER	DESTACK FEEDER
PRESS	Emergency stop		Line emergency stop	Line emergency stop
	Sudden stop		Sudden stop	Top
	Top stop		Top stop	↑
TRANSFER FEEDER	Emergency stop	Line emergency stop		Line emergency stop
	Sudden stop	Sudden stop		Top
	Top stop	Top stop		↑
DESTACK FEEDER	Emergency stop	Line emergency stop	Line emergency stop	
	Sudden stop	Sudden stop	Sudden stop	
	Top stop	Top stop	Top stop	

