PR

58 SHEETS

Baby Pants #9 (TP-2004)

(With cover)

TECHNICAL PROPOSAL

F O R

BABY TRAINING PANTS MACHINE

ZUIKO CORPORATION

OSAKA. JAPAN

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SECTION 1

INTRODUCTION

1-1 GENERAL

This technical proposal, prepared by Zuiko Corporation (hereinafter called "the Manufacturer), covers the technical specifications for "the Baby Training Pant Machine" (hereinafter called "the Machine") to be delivered to Tyco Healthcare Retail Group, Inc. (hereinafter called "the Customer"). The machine may also be referred to as Pants #9 (#9 Training Pant Machine), or ZC 04-xxxxx (as Zuiko's machine serial number 04-xxxxx). The project shall be called as "TP2004".

The detailed technical specifications for the Machine are stipulated herein and may be subject to change during the detailed engineering stage of TP2004.

SECTION 2

PRODUCT SPECIFICATION

2-1 PRODUCT SPECIFICATIONS

The Manufacturer shall provide one (1) Baby Training Pant Machine that is capable of producing Baby M, L and XL. The detailed specifications for each product within those groups are included in Attachment-1.

<Baby Pants>

- Medium Size: 375mm(P) x 490mm(L)
- Large Size: 375mm(P) x 540mm(L)

2-2 Product Size Change Parts

The size change parts required for a production of Baby X-Large is option.

- X- Large Size: 420mm(P) x 555mm(L)

SECTION 3

MACHINE SPECIFICATION

3-1 MACHINE PRODUCT CAPABILITY

The Machine shall be designed to have the following capability for Baby M & L size products.

Mechanical Design Speed;
600 diapers per minute (DPM)

Targeted Production Speed;
500 diapers per minutes (DPM)

3-2 MACHINE CHECKOUT CONDITIONS

The Machine shall demonstrate the above design and production capability by producing product to the respective product specifications at the Manufacturer's plant according to the machine acceptance criteria defined in section 3-3.

To accomplish the above, the customer is to supply to the manufacturer with raw materials to produce for 12 Hours of each size at 500DPM of production speed.

The manufacturer is to advise the customer shipping instructions and the delivery requirements of these raw materials. The Customer shall prepay the cost of raw materials and all freight charges including custom clearance up to the manufacture's factory.
The customer is to send samples of all new raw materials to the manufacturer within 30 days after placing an order or sooner.

After the machine acceptance checkout, the customer is to advise the manufacturer the disposition of the remaining raw materials.
They are either to be destroyed or shipped back to the customer at customer's fee.
The manufacturer has no responsibility for the remaining raw materials.

All product produced during the checkout is to be destroyed except for the Customer's requested samples of each size.
Samples shall be freighted by ocean or air to the customer with freight collected.

3-3 MACHINE ACCEPTANCE CRITERIA

3-3-1 Machine Acceptance Trials at the Manufacturer's Site

The manufacturer shall determine when the Machine is ready for acceptance trials to begin at the manufacturer's facility. Successful completion of these trials will result in the customer's approval of release for shipment. The Customer's personnel shall direct trials to verify that the Machine is capable of consistently producing product within specification according to the trial schedule described below.

Trial 1 – Dry Run

Dry run the Machine at 500 PPM for four (2) hours.

With the Side Seam Bonder/Final Cut, Turning Section and other process units which have speed limitation disengaged, dry run the Machine at 600 PPM for four (1) hours.

Trial 2 – Quality Acceptance (Baby Large-size)

With the Machine configured to produce size Baby Large, demonstrate that the Machine can produce complete products at 500 DPM for one (1) hour of runtime (not continuous) with zero (0) visual critical defects and less than 3% major defects. Maximum allowable elapsed time for this trial is four (4) hours. Critical defects are defined as those defects that would cause a safety issue, a nonfunctional product or the consumer's refusal to repurchase product. Major defects are defined by documentation from the Customer's Quality Manual.

Note: Time spent while running any Quality Acceptance trial may also be applied towards the time requirements for any succeeding Performance Acceptance trial as long as the performance results and machine configuration of the Quality Acceptance trial match those required by the Performance Acceptance Trial.

Trial 3 – Splicing Acceptance

Each side of splicer must separately demonstrate the ability to complete three (3) out of three (3) consecutive splices at a production speed at 500 DPM.

3-3-2 Machine Acceptance Trial Deferral

The Customer reserves the right to defer or waive any or all of the following trials to a later date and approve shipment prior to achieving the acceptance criteria at the Manufacturer's plant. In the case of trial deferral, the Customer shall not be entitled to further or other compensation from the Manufacturer. But, the remaining trials shall be conducted successfully either on a future machine at the Manufacturer's plant, or on the current machine at the Customer's facility. The Manufacturer shall conduct trials, and the Customer assists the Manufacturer at the Manufacturer's facility. The Customer shall conduct trials, and the Manufacturer assists the Customer at the Customer's facility. Any

additional development work required to meet the specification of the products, including but not limited to machine modifications and trials, shall be the responsibility of the Manufacture. The Customer agrees to enter suggestions for raw material changes in order to achieve acceptance criteria.

Trial 4 – Performance Acceptance (Either Baby Large or Baby Media)

With the Machine configured to produce size Baby Medium, the Machine shall meet the following performance criteria for one (1) hours of runtime (not continuous):

Machine Speed	500 PPM
Machine Up-time	85% or greater
Machine Waste	3% or less

3-3-3Machine Performance Acceptance at the Customer's Site

Trial Timing

The customer shall determine when the Machine is ready for Post Installation Performance Acceptance **(PIPA)** Trials. The Customer's personnel shall complete Quality Certification for a particular product prior to execution of the PIPA trial for that product.

Trial Purpose and Time Constraints

The objective of PIPA trials is to demonstrate that the Machine is capable of achieving specific production, waste and uptime goals for each product trial as described below. Each PIPA trial shall be at a specified production rate and for a total accumulated runtime of no less than four (4) hours. Total elapsed time shall not exceed eight (8) hours per trial. A particular PIPA trial may be stopped and then later resumed for the purpose of meals, overnight rest periods, elastic material change period and for downtime caused by events that are not the responsibility of the Manufacturer. In order to allow any pause or interruption, the Machine must remain absolutely unchanged during the period of time of which the trial is interrupted. If the trial is interrupted for a cumulative period greater than eight (8) hours, the trial must be restarted.

Trial Production Goals

Any trial is deemed successful only after an acceptable amount of product is produced. For each PIPA trial, the following formula defines Net Acceptable Production (NAP):

NAP = (PPM Run Speed) x (240 minutes) x (85% target uptime) x (100% - 3% target waste)

Trial Waste Definition

Waste results for PIPA trials shall be calculated in a manner that will discount any impact to waste for causes that are not the responsibility of the Manufacturer. Such causes may include, but are not limited to, Stacker malfunctions, Autobagger jams, Glue System faults, etceteras. For each PIPA trial,

the following formulas define Waste:

Waste = [{1 – (Net Output/Discounted Gross Output)} x 100]

Gross Output = [(Total Product Counter at Trial Stop) – (Total Product Counter at Trial Start)]

Discounted Gross Output = (Gross Output) – {(DENR) x (Culls per startup)}

Net Output = [(Discounted Gross Output) – (Products Culled)]

DENR = Total number of **Downtime Events** that are **Not** the **Responsibility** of the Manufacturer.

Trial Uptime Definition

Uptime results for PIPA trials shall be calculated in a manner that discounts any downtime for causes that are not the responsibility of the Manufacturer. Such causes may include, but are not limited to, Stacker malfunctions, Autobagger jams, Glue System faults, and etceteras. For each PIPA trial, the following formula defines Uptime:

Uptime = {(Accumulated Run Time) / (Elapsed Time – Interruption Time)} x 100

Interruption Time = The sum of all time periods where the trial paused for meals, overnight rest, elastic material change period and events that are not the responsibility of the Manufacturer.

Trial Sequence

The Customer shall determine the final order by which the following trials are conducted. The Manufacturer shall conduct each product configuration changeover with assistance of the Customer's personnel.

PIPA Trial 1 – Either Baby Large or Medium

With the Machine configured to produce either size Baby Medium or Baby Large, the Machine shall meet the following performance criteria for four (4) hours of runtime (not continuous):

Machine Speed	500 PPM
Machine Up-time	85% or greater
Machine Waste	3% or less
NAP	98,940 pieces minus (not manufactured events x startup reject numbers)

SECTION 4

PROCESS DESCRIPTION

4-1 GENERAL

The process description shall be stipulated herein.
All blanks to refer to product specification and the final machine layout.

4-2 CONVERTING MACHINE

The detail process description shall be in discussion with the customer at the earliest stage.

(1) Pulp Unwind: The Customer to provide all equipments.

・Location	In Line
・Spindle distance:	Max diameter 60”
・Handling roll dimension:	3”core, 20”width No Driven
・Core chucking	
・Auto splicing	N/A
・Web break detection	
・Low roll detection	

(2) Tissue Unwind

・Location	Off Line
・Unwind	Core drive
drive	Servo
Web tension control	Dancer & Drive Roll directly driven by servo
・Handling roll dimension	3”core, 12” width, diameter 1000mm
Roll weight	_____kg/roll
・Core chucking	Pneumatic
・Auto splicing	Zero speed splice with adhesive tape
・ Web break detection	programmable web detect (customer to provide sensors, manufacture to install them)
・Web guiding	

(3) Pulp Fiberizer : The Customer to provide all equipments.

・Mill	Capacity 620kg/h
Motor	Size 55KW
Rotor pattern	Zuiko standard saw mill
Sound enclosure	Out of scope
・Pulp feed	
Motor	Servo motor, Dual feed roll system
Operation	Panel-View
・Water mist	NA
・Operation	Panel View

・Step and ladder　The Customer to design and supply

(4) Forming Drum, Forming Chamber and Transfer Drum

The Customer to provide all below equipments

・Drive　Line shaft

Phasing　Zuiko phasing gear box

・Air flows

Vacuum source　Forming fan

Air blow　Compressed air

・Scuffing　Not recycling

・Forming capacity　_____g/m2～_____g/m2

・Forming pattern　Flat (No Trapezoid) design ,continuous straight

・ Forming Chamber

Scuffing roll Integrated design, no pulp recycling,
Forming Pulp with 3 layers

・ Transfer Drum

Drive　Servo

Vacuum source　H-pressure process fan

・Pulp detect sensor　Detect absence of fluff at Transfer Drum

・Control　the Customer to design

(5) SAP Applicator: Customer to supply all equipments and controls.

・Hopper　_____Litters Tank

SAP bag loading　the Customer to provide bulk bag feeding system

・Metering　provided by customer

Capacity　___g/min

Type　Loss & Weight system

SAP application　___

・Location　T.B.D.

・Controls　the Customer to design & install

(6) Fluff Conveyor: The Customer to provide all equipments.

・Drive　Servo

・Vacuum

Vacuum source　Process fan

・Hot melt application(1)

(7) Calendar Belt Press: The Customer to provide all equipments.

・Drive　Servo

・Gap adjustment　Adjust screw

・Loading pressure　Pneumatic

・Operation　Panel View

(8) No.1 Press Roll: The Customer to provide all equipments.

・Roll	
Upper	Flat
Lower	Flat
・Drive	Servo
・Gap adjustment	Adjust-screw
・Loading pressure	Hydraulic
. Operation	Panel View
. Web jamming detection	

(9) Tissue Folding Conveyor: The customer to provide all equipments.

・Drive	Line shaft
・Vacuum	
Vacuum source	Process fan
・Hot melt application(1)	

(10) No.2 Press Roll

・Roll	
Upper	Flat
Lower	Flat
・Drive	Servo Driven
・Gap adjustment	Adjust-screw
・Loading pressure	Hydraulic
・ Operation	Panel View

(11) End Side Sealer

・Roll	
Upper	Pattern
Lower	Flat
・Drive	Line shaft
・Gap adjustment	Adjust-screw
・Loading pressure	Hydraulic
・ Operation	common Panel View for No.2 press roll use
・ Over load Clutch	Torque adjustment by spring load

(12) Transfer Layer Unwind capable of loading record & traversing material

・Location	Off-line
・ Unwind	Core drive
Drive	Servo driven
Web tension control	dancer & drive roll directly driven by servo
・Handling roll dimension	3”core, maximum 20”width, diameter 1000mm
・Web break detection	programmable web detect (customer to provide sensors, manufacture to install them)
・Low roll detection	
・Panel View	
・Auto splicing	Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)

・Core chucking Pneumatic

(13) Transfer Layer Cut-and-Place

・Drive Line shaft
・Over load clutch Torque adjustment by spring load
・Web guiding (1)
・Hot melt application(1)
・Knife
  Knife lubrication Silicon sponge roll
  Knife adjustment Flex blade design
・Anvil Insert anvil block
・Vacuum
  Vacuum source Process fan
・Phasing Controls Zuiko phasing gear box
・ Hot melt application(1)
・ Operation Panel View

(14) Poly Unwind

・Location Off line
・Unwind Core drive
  Drive servo
  Web tension control dancer and drive roll directly controlled by servo
・Handling roll dimension 3”core, 6.5”width, diameter 600mm
・Core chucking Pneumatic
・Auto splicing Zero speed splice with adhesive tape
・Web break detection programmable web detect (customer to provide sensors, manufacture to install them)
・Low roll detection
・Web guiding (1)
・ Hot melt application(1)
・ Operation Panel View

(15) Top Sheet Unwind

・Location Off line
・Unwind Core drive
  Drive Servo
  Web tension control Dancer and drive roll directly driven by servo
・Handling roll dimension 3”core, 6.5”width, diameter 1000mm
・Core chucking Pneumatic
・Auto splicing Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)
・Web break detection programmable web detect (customer to provide sensors, manufacture to install them)
・Low roll detection
・ Web guiding (1)
・ Operation Panel View

(16) ULG Sheet Unwind

・Location Off line

- ・Unwind belts — Core drive
  - Drive — Servo
  - Web tension control — Dancer and drive roll directly driven by servo
- ・Handling roll dimension — 3”core, 6.5”width, diameter 1000mm
- ・Core chucking — Pneumatic
- ・Auto splicing — Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)
- ・Web break detection — programmable web detect (customer to provide sensors, manufacture to install them)
- ・Low roll detection
- ・ Web guiding(1)
- ・ Operation — Panel View

(17) ULG Construction

- ・Slitter
- ・Spreading
- ・ Web guiding before slitting (1)
- ・ Web guiding after slitting (2)
- ・Hot melt application — 1 each for O/S & D/S to attach leg elastics, comb gun head provided by customer
- ・Folding shoe — Chilled/Coated ULG Folding shoe except water cooling unit (cooling unit and piping, wiring are provided by customer)
- ・ Compression roll loading pressure: Pneumatic
- ・ Cuff folding — either Current W-folding cuff feature or new design cuff (T.B.D.)
- ・ Operation — Panel View

(18) ULG Elastic Unwind

- ・Drive — Off line (T.B.D.)
  - Draw control — AC or Servo motor (T.B.D.)
- ・Elastic break detection — Stuber
- ・ Handling rolls Max — 14 rolls
- ・ Handling roll dimension — Max Diameter280mm ,Max width 110mm

(19) ULG Holding Heat Sealer

- ・Drive — Servo
- ・ Controls — Open/Close by solenoid
- ・ Temperature control — Red-lion to communicate with PLC
- ・Loading — Pneumatic
- ・Seal Pattern — Zuiko standard continuous sealing pattern
- ・Transducer — Melcotac

(20) ULG End Heat Sealer

- ・Drive — Line shaft
- ・ Controls — Open/Close with solenoid
- ・ Temperature — Red-lion to communicate with PLC
- ・Loading — Pneumatic
- ・Seal Pattern — Zuiko standard intermittent sealing pattern
- ・Phasing — Zuiko phasing gear
- ・Transducer — Melcotac

(21) Top Sheet Path

- Top Sheet ,ULG Sheet and Core merge
- Web guiding
- Drive — Drive roll driven by servo
- Hot melt application(2) — 1 for to attach ULG to Top Sheet, 1 for to attach Top Sheet to Core/Poly.

(22) Mat Cutter

- Mat cutter In-feed conveyor
  - Drive — Servo motor
  - Vacuum — Process fan
- Drive
  - Cutter shaft — Line shaft
  - Anvil shaft — Servo (T.B.D.)
- Overload clutch — Torque control by spring load
- Phasing — Zuiko phasing gear
- Knife
  - Knife lubrication — Silicon sponge roll
  - Knife adjustment — Flex blade design
  - Knife material — High speed steel knife
- Anvil — Flat roll
- Loading pressure — Hydraulic
- Operation — Common Panel View that is used for No.2 press roll
- Jamming sensor

(23) Mat Spacing Conveyor

- Drive — Servo motor
- Vacuum
  - Vacuum source — High vacuum fan

(24) Core Assembly End/Side Sealer

- Drive — Line shaft
- Loading — Hydraulic
- Pattern
  - upper — Pattern(silicone rubber)
  - lower — Flat anvil
- Phasing — Zuiko phasing gear box
- Operation — Panel View

(25) Absorbent pad Cutter

- Absorbent pad cutter — Integrated with 90 degree Turning drum deseing
  - Drive — Line shaft
  - Over load Clutch — Torque adjustment by pneumatic
  - Jamming sensor
  - Phasing — Connected with 90 degree Turn drum
- Knife
  - Knife lubrication — Silicon sponge roll
  - Knife adjustment — Flex blade design
  - Knife material — High Speed Steel knife
- Loading pressure — Pneumatic

・Operation Panel View
・ Hotmelt (1)

(26) 90 degree Turn Entry Conveyor
・Absorbent pad cutter In-feed conveyor
Drive Servo motor
Vacuum H vacuum fan

(27) Core 90 degree Turning Drum
・Drive Line shaft
Phasing Zuiko phasing gear box
・Vacuum
Vacuum source H vacuum fan
・Operation Panel View
・Jamming sensor

(28) After 90 degree turn Conveyor on which ABS pad placed
・Drive Servo Motor
Vacuum High-pressure fan
・ Install proximity switch on the Absorbent pad cutter to stop at established point by push button .

(29) No.1 Inner N.W. Unwind
・Location Off line
・Unwind Core drive
Drive Servo
Web tension control Dancer & drive roll directly driven by servo
・Handling roll dimension 3”core, 15”width, diameter 1000mm
・Core chucking Pneumatic
・Auto splicing Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)
・Web break detection programmable web detect (customer to provide sensors, manufacture to install them)
・Low roll detection
・Web guiding on (1) for before slitting, two (2) for after slitting
・ Operation Panel View
・ Slitting driven by servo
・Hot melt application 1 each for O/S D/S to attach tummy elastics (comb head to be provided by customer)

(30) No.2 Inner N.W.
Capable of adding No.2 Inner NW to produce current product
・Location Off line in the future
・Unwind Core drive
Drive Servo
Web tension control Dancer & drive roll directly driven by servo
・Handling roll dimension 3”core, 15”width, diameter 1000mm
・Core chucking Pneumatic

- ・Auto splicing — Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)
- ・Web break detection — programmable web detect (customer to provide sensors, manufacture to install them)
- ・Low roll detection
- ・ Web guiding (1)
- ・ Operation — Panel View
- ・ Slitting — driven by servo

(31) Tummy band elastic applicator

- ・Location — Off line
- ・Unwind belt
  - Drive — Servo driven
- ・ Handling rolls — Max 100 rolls
- ・ Handling roll dimension — Max Diameter280mm ,Max width 4”
- ・Elastic break detection — Stuber sensor

(32) Tummy band elastic Emboss Cutter

- ・Tummy band cutter
  - Drive — Line shaft
  - Over load clutch — Torque control by spring
  - Jamming sensor
  - Phasing — Zuiko phasing gear box
- ・Emboss shaft
  - Lubrication — N/A
  - Gap Adjustment — Wedge block
  - Emboss pattern — Pattern block (shell) can be adjusted/changed for size changeover
- ・Anvil — Flat roll
- ・Temperature Control — Red-Lion to communicate with PLC
- ・Transducer — Slip-ring
- ・Loading pressure — Hydraulic
- ・Over Load Clutch — Torque adjustment by spring load
- ・Operation — Panel View

(33) Outer Nonwoven Unwind

- ・Location — Off line
- ・Unwind — Belt Surface Drive
  - Drive — Servo
  - Web tension control — Dancer & drive roll directly driven by servo
- ・Handling roll dimension — 3”core, 30”width, diameter 1000mm
- ・Core chucking — Pneumatic
- ・Operation — Panel View
- ・Auto splicing — Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)
- ・Web break detection — programmable web detect (customer to provide sensors, manufacture to install them)
- ・ Row roll detection

- Operation — Panel Veiew
- Web guiding (1)
- Hot melt — one (1) for Inner NW to Outer NW

(34) Applique film Unwind
- Location — Off line
- Unwind — Core drive
  - Drive — Servo
  - Web tension control — dancer and drive roll directly controlled by servo
- Handling roll dimension — 3”core, 12”width, diameter 600mm
- Core chucking — Pneumatic
- Operation — Panel View
- Auto splicing — Zero speed splice with adhesive tape (impulse seal and its electrical devices are option)
- Web break detection — programmable web detect (customer to provide sensors, manufacture to install them)
- Row roll detection
- Web guiding — one (1) for before slitting, two (2) for after slitting
- Slitting — one (1) Center slitting process

(35) Applique film Cut-Place
- Applique film In-feed conveyor
  - Drive — O/S, D/S conveyor driven by individual servo
  - Vacuum In-feed conveyor — H vacuum fan
  - Applique Picture Phasing — N/A
- Applique film cutter
  - Drive — Line shaft
  - Over load Clutch — Torque adjustment by spring load
  - Jamming sensor
  - Phasing — Zuiko phasing gear box
- Knife
  - Knife lubrication — Silicon sponge roll
  - Knife adjustment — Flex blade design
  - Knife material — Carbide knife
- Anvil — Carbide Anvil piece design
- Loading pressure — N/A
- Operation — Panel View

(36) Waist Elastic Unwind
- Location — Off line/ In line (T.B.D.)
- Unwind belt
  - Drive — Servo or AC driven
- Handling rolls — Max 10 rolls
- Handling roll dimension — Max Diameter280mm ,Max width 4”
- Elastic break detection — Stuber sensor
- Hot melt application — 1 each for O/S & D/S (comb head to be provided by customer)

(37) Waist Folder
- Drive — Servo

Vacuum	H pressure fan
・Adjustment	Folding plate assembly with adjustable structure in CD
・ Hot melt application	1 each for O/S & D/S (comb head to be provided by customer)

(38) Expand conveyor

・Drive	Servo
・ Vacuum	H vacuum fan

(39) Leg Hole Die Cutter

The customer provide all die module, The manufacture provide drive and mounting parts to install

・Drive	Line shaft
Phasing	Zuiko phasing gear box
Over load Clutch	torque control by spring load
・Dies	manufactured by ICD/BCD (customer's choice)
Die lubrication	
Die material	
・Anvil	
・Loading pressure	N/A
・Jamming sensor	
・Trim removal	
Fan	Supplied by the Manufacturer
Vacuum hood	Supplied by the Manufacturer
Trim nozzle and ducting	the Manufacture to supply ducts & trim nozzle inside the machine, the Customer to supply ducts, ducting, trim chopper which are placed outside the machine.
・ Operation	Panel View
・Vacuum	
Vacuum source	H vacuum fan

(40) Inspection Drum

・Drive	Servo
・Transparent drum	Supplied by the Manufacturer
・Lighting	Supplied by the Customer
・Camera	Supplied by the Customer

(41) Bi-folder

・Folding board	
Material	Stainless Steel
Adjustments	Roll height can be adjusted
・ Web guiding (1)	Special bi-folding web guider
・ Compression Belt Unit before 90 twist conveyor	
Drive	Servo
Gap setting	Adjust screw
Controls	Pneumatic
	Open/Close

(42) 90° Twist Conveyor

- Drive — Servo
  V-belt upgrading to bunch drive rollers

(43) Belt Compression Unit before Final Sealing Unit

- Drive — Servo
- Gap setting — Adjust screw
- Controls — Open/Close

(44) Final seal & cut/off

2-Stage sonic or an Oscillation system to be chosen after confirmation of a test result carrying out at the Manufacture and patent expert opinions.

- Seal Pattern Drum
  - Drive — Line shaft
  - Over load clutch — Torque control by pneumatic
  - Phasing — Zuiko phasing gear
  - Seal pattern — Zuiko standard (T.B.D.)
- Sonic System
  Manufactured by Herrmann Ultrasonic
  - Gap adjustment — Micro gap control by servo
- Final Cut Station
  - Knife
    - Knife lubrication — Silicon sponge roll
    - Knife adjustment — Flex blades design
    - Knife material — High Speed Steel
  - Anvil — Anvil block integrated with Seal Pattern Drum

(45) 90 degree transfer drum, hand-over conveyor, cull gate

If an oscillation system is chosen, a final cutter is added in this 90 degree transfer drum

- Transfer drum — 90° turn.
- Hand-over conveyor
  - Drive — Servo
  - Vacuum source — H-pressure
- Cull gate — Open/Close by pneumatic
- Transfer — To Stretch flap, one (1) fan and blow nozzles to be installed underneath 90 turning drum
- Operation — Panel Veiew
- Jamming sensor

(46) Product Tuck folding

- Folding Plate
- Folding Conveyor
  - Drive — Servo
  - Overload Clutch — Torque controlled by pneumatic

(47) Hot melt Glue System

・Model	NORDSON ATS series
・Pattern control	By PLC (hardware & software to be provided by customer)
・Application	Sumit for “Core to chassis” Coater for “ULG attachment” Comb head for ULG, Tummy, and Waist elastics and elastic which are provided by the customer Spiral for other than above applications
・Bracket	Zuiko standard design with pull out structure

(48) Control

・Main power	480V, 60Hz
・Drive system	Line shaft and servo drive
Main motor	AB Servo
・Controls	
COP	
Type	Standalone Cabinet
CPU	Windows PC and Wanderware operation display which are provided by the customer
PLC	Control Logics
Servo	Kinetix via Sercos
MCC	Power supply for Servo motors, fan motors and hotmelt to be distributed from the manufacture’s MCC, Primary power and other power supply to be distributed from the customer’s MCC . (T.B.D.)
Glue Control	Glue tank communicates with Wonderware via Ethernet, all intermittent timings are created by PLC which is provided by the customer. The PLC is to be mounted in spare rack of Control-Logics.
・Message display	One (1) DL-40 of master, three (3) DL-40 of slave to be provided by customer, the Manufacture to install.
・Auto splicing	Zuiko standard 0 speed splice
・Wire way	Three separated rooms with hinged cover, dust tight
・Tension control	Dancers and potential meter/encoder, Drive roll directly driven by individual servo
・Camera inspection system	Entire system to be provided and installed by the customer. The manufacture will prepare the space in COP to mount operation panel of inspection system. The manufacture to provide transparent drum in which electric light can be mounted.
・Product cull	Scrap, splicing and out of spec product to be rejected
・Others	
AC110V outlet	the Customer provide receptacles, the manufacture to install in each frame
Maintenance light	the Customer to provide and install fluorescent lamp
Heater controller	Red-lion temperature control to communicate with PLC

(49) Safety

・Drive side guards	Aluminum or metal frame door with Lexan window,

	Schmersal limit switches (O/S shall be controlled by software, D/S shall be operated by hard wire & PLC)
・Operator side guards	Aluminum or metal frame with Lexan panel
・Life-line	Both operator & drive side (and shall be operated by hard wire)
・Stop definitions	Zuiko Standard
Normal	(Normal stop button to be installed in every other local boxe at drive side)
Emergency (E-Stop)	Installed in every Panel View controller
・ Dump valves	Install pneumatic dump valves with interlock at O/S

SECTION 5

UTILITY SPECIFICATIONS

5-1 GENERAL

The following utilities shall be supplied by the Customer.

5-2 UTILITY SPECIFICATIONS

(1) Electrical
Voltage
Primary 480V 60cycle 3 phase
(480V is documentation purpose only, components are identical to #7 & #8 machines which have been supplied .)

Primary 230V 60cycle 3 phase

Adhesive system 230V 60cycle 3 phase
Control 110V 60cycle 1phase grounded neutral
logic 24V DC
sensors 24V DC
solenoids 24V DC

The Customer to provide main MCC for 480V & 230V 60 cycle 3 phase with isolators and fuses to feed power into the manufacture's MCC.

Transformer for 110V is to be provided by the manufacturer, for 230 & 480 are provided by the customer.

(2) Compressed Air at machine minimum pressure necessary : 5kg/cm2 Gauge

SECTION 6

ELECTRICAL SPECIFICATION

6-1 CODES AND STANDARD

All electrical shall be or exceeds the NEC (American National Electrical Code) - Standard

6-2 ELECTRICAL SPECIFICATION

The equipment shall comply with the Electrical Standards & Specifications as attached . (attachment No.6)

(1) Basic concept of control

- Control Logics PLC by RS-logics programming
- Kinetix technology servo motors via Sercos by RS-logics programming
- Install C-Net and Ethernet modules in Control-Logics rack
- Install Glue control PLC (provided by customer) to in Control-Logics rack
- WonderWare equipment and software to communicate (provide by customer) communicate with PLC

SECTION 7

SPECIAL REQUIREMENT

7-1 GENERAL

The following special requirements shall be taken into consideration for the design of the Machine.

7-2 SPECIAL REQUIREMENT

(1) Hand of machine is Right Hand
- Standing on the operator side of the machine and while facing the machine if the stacker is to the right side,
  It is right hand machine.

(2) Paint
The Manufacturer standard.
1-Primary coat
2-finish coats

All machine surfaces that contact the product or raw materials except anvil rolls of die cutting unit and aluminum roll shall be non-corroding. Plastic, stainless steel, Teflon coated steel or similar materials shall be used. Painted surfaces are not used for product contact.

Shafts and other machine drive components shall be black oxide or similarly coated to avoid surface corrosion.

(3) Machine color
The equipment shall be painted per paint sample. Paint sample shall be supplied by the customer.
3 different colors shall be painted.
Main frame : off-white
Control panel : Blue
Safety guards : Yellow

(4) All operator and drive side guards will have interlock switches that stop the machine when the guards are opened.

(5) Equipment Drive Specifications.
All drive components shall be designed based on a targeted production speed of 500 diapers/minute.

All drive components shall be capable of handling the torque and stresses generated from an emergency stop. An emergency stop is defined as ramping and

equipment down from a machine speed of 500 pads/minute to 0 pads/minute in a minimum time duration. Disc brake system shall be installed at main shaft.

(6) Product Size Change Specifications
The equipment shall be capable of producing the Medium and Large size products per the baby diaper specification .
Changeover parts for another baby size product to be discussed as optional spec if necessary.
The manufacturer shall design with minimum changeover time as a priority criteria.

(8) Machine Size Sound Levels
The Manufacturer shall try to lower noise level at Zuiko's standard.

(9) Extra Space
To be discussed separately.

(10) Documentation
The Manufacturer will prepare in English (3) sets of:

- Assemble drawings for parts identification
- Driving part drawing with belt and bearing specifications
- Operating manual
- Maintenance manual (prevent maintenance manual)
- Installation manual
- Spare parts list
- PLC diagram
- Electrical drawings
- Purchased equipment specifications
- Product size change-over manual

(11) Raw material loading devices to be prepared by The Customer.

(12) Special training
Training program shall be provided separately.

(13) Jog mode
The machine controls shall be capable of operating in jog mode, as well as thread and production speed. Initial speed of thread shall be 50 diapers per minutes. The speed can be changed.
Remote Jog switch provided by customer to be installed in each Panel View station .

(14) The machine without packaging process is designed to be operated by two persons in the customer's production department.

(15) The customer has a right to cancel the order of this machine for any reason, however, following cancellation fee is charges to the customer all the time.
The order shall start to count upon receipt of the Letter of Intent or Purchase Order in writing from the customer.

- If canceled in a period of 1 to 30 days: 30 % of purchase price

- If canceled in a period of 31 to 60 days: 50 % of purchase price
- If canceled in a period of 61 to 90 days: 70 % of purchase price
- If canceled in a period of 91 to 120 days: 90 % of purchase price
- Machine is substantially complete after 120 days and cannot be canceled

(16) Any charges requested by customer after the acceptance of this document shall be handled by the following manner:

- A change log shall be maintained by the manufacturer
  The following information shall be recorded in the change log
- Description of goods
- Estimated cost of changes
- Impact of machine delivery date due to the changes
- Approval signature
- Approval signature of customer’s representative and a manufacturer’s representative shall be obtained prior to the implementation of any changes

SECTION 8

EXPECTED UTILITY CONSUMPTION

8-1 EXPECTED UTILITY CONSUMPTION

If the machine shall be operated properly in accordance with The Customer's operation maintenance manuals, the expected utility consumption for each complete machine shall be as follows:

(1) Electrical Power : 480V :Approximately 400KVA
230V :Approximately 75KVA plus 118KVA

(2) Compressed Air : Minimum presser 5KG/cm2Gauge, Approximately 4500 litters/minute,
Air shall be clean and dry at machine

Above figure may be subject to change on the detailed engineering stage.

SECTION 9

SCOPE OF WORK

9-1 GENERAL

The manufacturer shall undertake the works described herein.
The Contract shall be based on FOB.

9-2 SCOPE OF WORK

The manufacturer shall supply the said goods described in this technical proposal, including underlisted categories related to the said goods.

1) Accessories and auxiliary equipment
2) Drawing and documents
3) Inspection and checkout
4) Rust proofing and painting
5) Export packing
6) Inland transportation to the indicated location in Kobe, Japan

9-3 OUT OF SCOPE

The manufacturer shall not take the following works.

1. Foundation construction and machine installation at site.
2. Primary wiring for converting machine.
3. Compressor and piping
4. Duct and duct installation (Not specified by manufacturer in specification.)
   Dust collector
5. Fire protection system
6. Air condition system
7. Products trim collector
8. SAP bulk bag loader ,Stand ,Hoist
9. Metal detector/weight checker
10. Sound protection system ,sound enclosure
11. Camera inspection system
12. Plat form, stairs and handrail
13. Raw materials loading devices
14. Leg Hole Die cutter

9-4 SUPERVISIONS AT SITE

The manufacturer shall dispatch their engineers to the customer's site to give instruction and advise on installation, start up and acceptance trials.
No daily allowance will be charged for the manufacturer's engineers for the man days described in the Machine Description (quotation) including weekend and holidays. The customer shall pay ¥85,000 per day per 8 hours per engineer for any services in excess of the allowed man days described in. For all support services provided, the customer shall pay the following fees.

1. Round trip air fare between Japan and the customer site
2. Hotel Accommodations.
3. Daily meals.
4. Local travel expenses
5. Medical care, if required, during engineer's stay.
6. All taxes, levies and duties imposed on the manufacturer's support personnel by the customer's government or other competent authority, if any.

SECTION 10

WARRANTY AND GUARANTEE

10-1 WARRANTY CLAUSE

1. The machine quoted is guaranteed to produce a good commercial product at the speed indicated in ZUIKO's quotation when using the raw materials equal to the kind and to the quality considered standard by ZUIKO and operated by highly skilled personal.

2. The machine and parts are warranted against any defect in material and workmanship for a period of 12 months from the date of start-up at purchaser's factory or 14 months from the date of shipment at Japanese port, whichever comes first.

3. During the warranty period, ZUIKO will perform necessary repairs, modification and/or replacement of any part of machine due to the defective of workmanship or materials , upon inspection by Zuiko's authorized person , at its plant or purchaser's plant , by F.O.B. Osaka/Kobe Japan basis . Purchaser to give immediate notice in writing to describe the defect(s) , and return the defective part(s) to Zuiko , if it is required .

4. This warranty shall not apply to any machine which in ZUIKO's judgement have been tampered with in any way out side its plant or have been subject to erroneous handling, improper maintenance or accident.

5. Parts considered normal wear and tear are not covered with this warranty.

6. ZUIKO shall not be responsible for any loss or damage incurred by cease of production for a period of the repair.

7. The service of supply of the parts by ZUIKO is available for a period of seven(7) years after delivery of the machine. However, as for the parts not directly manufactured by ZUIKO, it is subject to such warranty conditions as that given by the manufacturers of such parts.

ATTACHMENT

ATTACHMENT 1

PRODUCT SPECIFICATION

ATTACHMENT 2

CONCEPT FLOW DIAGRAM

ATTACHMENT 3

MACHINE LAYOUT

ATTACHMENT 4

MACHINE DESCRIPTION

ATTACHMENT 5

STANDARD MACHINE COMPONENTS

ATTACHMENT 6

HOTMELT APPLICATOR

ATTACHMENT 7

ELECTRICAL STANDARDS & SPECIFICATIONS

13 SHEETS

TP-#9 (With cover)

ELECTRICAL STANDARDS

AND

SPECIFICATIONS

ZUIKO CORPORATION

OSAKA. JAPAN

DATE _____

CHECKED BY _____

CHIEF OF PART _____

CHIEF OF SECT _____

MFG. NO _____ SHEET NO _____

CODE. NO _____ DRAWING NO _____

Table of Contents

1 APPLICABLE STANDARDS

All electrical shall be or exceeds the NEC (American National Electrical Cod Standard)

2 ELECTRICAL EQUIPMENT

2.1 Control panel, Operation panel, Integrated panel

2.1.1 Construction

- Panels installed in the electric room shall be a general, stand-alone, simplified dust proof type.
- Panels to be installed in the field can be selected from stand-alone, desk top, and bulkhead mounted types after discussions with us.
- Panels for outdoor use must be waterproofed by using a double door construction. Panels for indoor use can have a simplified dustproof design.
- The stand-alone panels must be equipped with fluorescent lamps. A Door switch must turn on the light when the door is opened.
- In general, the control panel should be wired through ducts or conduit run above the panel.
- The floor wiring in the stand-alone type must come in through the cable holes in the box and be secured with a PVC plate 7-8 mm thick attached with screws. Doors must be installed front and back with an opening space of 1.5 m. If the cables are routed in any other way, a prior agreement will be necessary.
- The panels must be designed to keep the internal temperature at less than 40℃. The internal volume can be increased or a cooling fan may be used as necessary to limit the maximum temperature.
- Do not place any magnetic valves, hydraulic lines, or pneumatic lines inside the control panels.
- If any of the above items must be run through the panel, they must be physically isolated from the electrical circuits and a separation plate should be put between those devices and the circuits.
- A document holder should be installed on the control panel door.
- The power outlets in the panel for the use with portable power tools or lighting must be step down to 120 VAC single phase
- Do not connect the calendar timer for heating-up without personnel operation to the hot melt applicators by the reason of fire protection .
- Attach the main NFB and the main relay contacts to the hot melt applicators.

2.1.2 Materials and coating

- For the control panels; the cabinet must be made of 2.3 mm thick stainless steel, and the Intermediate plates must be made from 3.2 mm thick stainless steel.
- For the operation panels; the cabinet must be made of 1.6 mm thick stainless steel, and the Intermediate plates must be made from 2.3 mm thick stainless steel.
- Where water may splash, use uncoated 2 mm SUS.
- Unless otherwise specified, the finish color will be Zuiko's standard color and the internal plates will be cream (Nippon Paint R3-309 Munsell 2.5Y9/1) matte finish
- Other electrical and electronic parts will be in the supplier's standard colors.

3 POWER SUPPLY

3.1 Mains voltage and number of circuits

- Primary supply - 3 ph, 460V ±10%, 60 Hz (amperage to be determined)
  - 3 ph, 230V ±10%, 60 Hz (amperage to be determined)
- As necessary - 3 ph, 460V ±10%, 60 Hz (amperage to be determined)
  - 3 ph, 230V ±10%, 60 Hz (amperage to be determined)
- Separate power circuits for a converting machine and the hot melt heater.

3.2 Power supply for control panel

- For control; Single phase, 200/220 V ±10%, 50/60 Hz
- ±24/15/12/ 5 VDC
- Special voltages: to be determined later
- 100 VAC power for control circuits to be supplied by stepping down the primary power

3.3 Others

- For small scale systems, the necessary power supplies will be produced in the control panel from a single primary power system.
- The power supply cable requirements will be determined by us; the necessary terminal strips can be purchased locally, according to the cable size. All parts must comply with the electric installation regulations and domestic wiring standards that are applicable.

4 CONTROL CIRCUIT DESIGN

4.1 Control circuit

- PLC and other electric relay circuits and sensor circuits should operate on 24 VDC, as a general rule.
- The sensor supply can be ±15 /12VDC or ±5 VDC.
- Power circuits and the emergency stop circuit should be directly wired from the main 200/220 V, 50/60 Hz supply.
- Electromagnetic hydraulic valves, pneumatic valves, clutches, etc., other than motor circuits, should operate on 24 VDC.
- Panel illumination, cooling fans and outlets, if any, shall be equipped with a separate breaker not used by other control circuits.

4.2 Shield circuit

- In order to reduce electromagnetic interference, the control circuits should be separate from the power lines and shielded cables should be used.
- Electromagnetic noise control measures should be discussed separately. Installation must use adequate grounding and shielding.

5 EQUIPMENT

We would like to be advised about any required electric and electronic devices that need to be installed. If we do not receive any advice about these items, we will use our standard items, as follows:

5.1 Standard items

Appropriate parts will be used from the following list.

Standard device	Manufacturer	Type or specifications
No-fuse breaker	Cutler Hammer & AB	
Circuit protector	Cutler Hammer & AB	
Relays switchgear	Mitsubishi	
Relays contractor	Mitsubishi	
Current meter	Mitsubishi	80 sq, Red pointer
Rheostat	Mitsubishi	15 or 5 VA
PLC	AB	Control-Logics
Push-button switches	Izumi	ϕ22 press-in type
Push-button switches, illuminated	Izumi	ϕ22 press-in type
Push-button switches, emergency	Izumi	ϕ22 press-in type
Indicator lamps, round	Izumi	200/220 VAC,24 VDC incandescent
Indicator lamps, square	Izumi	200/220 VAC, 24 VDC incandescent
Terminal strips	Izumi	Type BN
Counters	Koyo	Digital indicators
Counter	Omron	Digital indicators
Proximity switch	Koyo	PNP current output type
Proximity switch	Omron	PNP current output type
Photoelectric switch	Banner	PNP current output type
Photoelectric switch	Omron	PNP current output type
Photoelectric switch	Matsushita	PNP current output type
Rotary encoder	Yasukawa	PNP/line drive type
Rotary encoder	Koyo	PNP/line drive type
Variable cam	NSD	PNP current output type
Variable cam	Omron	PNP current output type
DC regulated power supply	Omron	Switching
Noise filter	Tohoku Metal	
Noise filter	TDK	
Sensor controller	Omron ,Kience ,Banner	
Relay	Omron	Type MY
Timer	Omron	
Transformer	Fujimura	
Transformer	Aihara	
Transformer	Toyo	
Servo motor	Allen Bradly	Kinetix via Sercos
Main Motor	Allen Bradly	Servo

5.2 Selector switch

Switch should be 22ϕ.

5.2.1 Color code (Selectable)

Heater, heater control	Red knobs (Red also for illuminated type)
Splice related parts	Green knobs (Green also for illuminated type)
Others	Black, yellow and blue knobs

5.2.2 Knob control positions for selector switches

Knob position

Left	Center	Right
OFF		ON
Stop		Operate
Lower		Raise
Manual	OFF	Auto
Manual	Stop	Auto
Reset		Set
Reset	N	Set
Independent	Stop (OFF)	Interlocked
Independent	Stop (OFF)	Interlocked

5.3 Push-button switches, Illuminated push-button switches

Push-button switches shall be of size ϕ22.

5.3.1 Color code (Push-button switch)

ON, Operate, Start	Green (Green also for illuminated type)
OFF, Stop, Emergency stop	Red (Red also for illuminated type)
Reset	Yellow (Yellow also for illuminated type)
Start signal	Black

5.3.2 Layout (Push-button switch)

ON, Operate, Start	Upper or Right
OFF, Stop	Lower or Left

5.4 Indicator light

5.4.1 Color code

Power lamp	Cream
Operate	Red
Stop	Green
Safety interlock, Failure	Orange, Yellow

・ LEDs not provided with lamp test facility.

5.5 Instruction label

Instruction labels required on the panels and interior units

5.5.1 Label specifications:

Form	Rectangular, White letters on a black background
Format	Helvetica bold
Size	40 W x 10 H x 2 D (mm)
Other dimensions	As appropriate

- Specifications label will be made of an acrylic plate attached to the NFB and circuit protector, etc.
- Relay NOs will be attached to auxiliary relays
- Charger in the panel will be equipped with a shock prevention cover(clear acrylic)

5.6 Relay

- Auxiliary relays will be appropriate for their intended use.
- Mini power relay will be the plug-in type, with an integrated run indicator lamp and surge absorber device.

5.7 PLC

- PLC shall be made by Allen Bradley Control-Logics .
- The sequencers will be powered from 100V or 200 VAC lines equipped with noise suppression devices. They will be installed in accordance with the manufacturer's instructions.

5.8 Switching power supply

- Switching power supply will be a high durability Omron model.

5.9 Control servo motor

- The control servo motor shall be Allen Bradley Kinetix

5.10 Main motor

- Allen Bradley Servo Motor

5.11 Sensors

5.11.1 Limit switches, proximity switches (Kience, Omron)

- The correct type is selected with respect to usage.
- The switching frequency and working environment are taken into account.
- Limited use of unspecified types only when unavoidable.
- In general, sensors with 24 VDC integrated amplifier will be used.

5.11.2 Photoelectric switch

- The correct type is selected with respect to usage.
- The sensing distance, switching frequency and working environment are taken into account.
- In general, 24 VDC types are used.

5.11.3 Rotary encoders

- 5 or 12VDC line drive output types. Limited use of unspecified types only when unavoidable.

5.11.4 Status monitor

- A status monitor, if optionally required, will be a digital type.

5.11.5 Solenoid valves (Made by SMC)

- The correct type is selected with respect to usage.
- 24 VDC types.

5.12 Installation

- Metal fittings will be selected for material and thickness that is strong enough to withstand shock and stress.
- Accessories supplied by manufacturer or the like may include more items than those listed above.
- An air purge will be installed as necessary to avoid malfunctions caused by paper chips or dust.
- All sensors and other parts will be installed according to the supplier's instruction.

6 PANEL WIRING

600 V MLFC or IV line, 2 mm2 or heavier.

- Power lines and load lines will usually have the following colors:
- Lines will be identified with color caps or marking tubes with line numbers.

Red (Black)	White (Black)	Blue (Black)
R	S	T
U	V	W
L1	L2	L3

6.1 Grounding line

Green or yellow with a green spiral stripe

The grounding line for power lines is marked E. The ground for low voltage control lines is marked TE.

6.2 Control circuit

- AC control circuit　600 V IV line, 1.25 mm2 or heavier, Black above 110V
- DC control circuit　600 V IV line, 1.25 mm2 or heavier, Blue
- PLC I/O circuit　600 V IV line, 0.5 mm2 or heavier, DC: Blue, AC: Yellow
- Thermal compensation conductor
  (O) k/CA　( ) J/IC　( ) JPt101　<(O): Usage class>
- Others　Electrical accessory lines and special wires are not subject to the specifications above.

6.3 Wiring system

- Wiring inside the panel will usually be surface wiring, with combinations of ducts and bundled wires.

6.3.1 Termination:

- Both ends of the wires will be marked with numbered sleeves.
  *The sleeves will be oriented so that the most significant digit is closest to the left or lower side of the junction terminal.
- Crimp-on lugs will be the round type in the main circuit, Y type is used in the control circuit. (This specification is not firm, depending on the equipment terminals)

6.4 Arrangement of terminals and wires

- The power lines and the grounding lines will be run close to each other.
  * The control panel door will be grounded.

R ・S ・T・E　U1・V1・W1・E　+12V・OO1・OV・78・SH

E: Ground　SH: Shield

- In principle, the terminals will be in grouped separately for the power circuit, AC control circuit, and DC control circuit.
- Auxiliary relays and timers will be mounted on DIN rails. Other parts will also be on rails whenever possible.
- The terminal block will be arranged so that the terminals are in order from left to right, and from top to bottom.
- The layout will be as shown below, depending on the polarity.

R S T U1 V1 W1 U2 V2 W2 P N O1 O2

From left to right

From to top to bottom

7 ELECTRIC WIRING

All electric wiring will be installed in compliance with the relevant electrical engineering standards and our own electric wiring standards.

7.1 Wiring methods

- No lines will be laid around the machines and peripherals.
- The wires will be protected with MAS vinyl jackets or protective conduits or spiral tubes, in compliance with the Japan Machinery Association standards.
- No paint is required; flexible tubes can be left black.
- Cables will be connected using crimp-on lugs and will be numbered with marking tubes to match the numbers on the terminal strips.
- The cable list will be attached with tape at both ends of the cables.
- Installation work will be done after discussion with our engineers.
- In principle, the cables used will be as listed below, except for a special cases of compensation conductors and the like:

7.1.1 Low voltage power line

600 V - CV　　600 V - VCT

7.1.2 Control line

300 V - VCTF　　300 V - MVVS　　Lower power FKEV-SB

7.2 Grounding

7.2.1 Types and resistance:

Work	Resistance
Class A grounding	±10Ω
	Class B grounding (Short-circuit current in Amperes on the high voltage or special high voltage side of the transformer)- 150 (Ω)
Class C grounding	±10Ω
Class D grounding	±100Ω

7.2.2 Execution

・ Class D grounding work:

Type of work item	Grounding line size	Remarks
Secondary winding of the transformer used for low voltage exceeding 300 V or high voltage instruments	ϕ1.6 mm or heavier	Instrument cables shall meet the left column.
Steel pedestal and metal housing for machinery using voltages less than 300 V	≦ 3.7 kW ≧ 2 mm2 ≦ 7.5 kW ≧ 5.5 mm2 ≦ 15 kW ≧ 14 mm2 ≦ 37 kW ≧ 22 mm2	
Tubing for cables carrying 300 V or less, and ducts	Same as above	

・ Class C grounding work:

Type of work item	Grounding line size	Remarks
Steel pedestal and metal housing for machinery using voltages exceeding 300 V	Same as Class C work	
Metal tubes or boxes for low voltage cables exceeding 300 V	Same as above	

・ Class B grounding work:

Phase capacity of transformer	Size of grounding line	Remarks
≦ 5 kVA	≧ 2 mm2	Transformer neutral point grounded in all cases
≦ 10 kVA	≧ 8 mm2	
≦ 20 kVA	≧ 14 mm2	
≦ 40 kVA	≧ 22 mm2	
> 40 kVA	≧ 38 mm2	

・ Class A grounding work:

Transformer phase capacity	Grounding line size	Remarks
Main grounding line and arrestor	≧ 14 mm2	
Others	≧ 5.5 mm2	

8 DOCUMENTATION FOR THE ELECTRICAL SYSTEM

Category	Specifications	Completed plan	Volume
Main circuit	○		2 (1 for return with seal)
interconnection		○	3
Exploded connection	○		2 (1 for return with seal)
diagram		○	3
Unit layout drawings	○		3 (1 for return with seal)
(Control panel interior,		○	3
Terminal strip layouts)			
Parts list (Inside the		○	3
control panel)			
Junction terminal		○	3 Operation Manual
drawings (Junction box)			
Operation manual for		○	3 Important documents
special control machines			
(Sequencers etc.)			
Sequential program		○	3 Important documents
drawing			

ATTACHMENT 8

TIME SCHEDULE

ATTACHMENT 9

MACHINE QUOTATION

ATTACHMENT 10

TRAINING PROGRAM

TRAINING PROGRAM:

Training of the Customer's engineers at the Manufacturer's plant before the shipment of the machine is one of the most important factors in achieving a successful operation at the Customer's plant. The following is the Training Program recommended by the Manufacturer.

1. General:

    - Classroom training
    - Shop training
    - Maintenance training
    - Shut down/start up
    - Trouble shooting
    - Others

2. Schedule and Duration:

    The training shall consist of two parts.

    1. Training at commercial vendors' shops and classroom training at the Manufacturer, which continues for two weeks prior to the qualification test.

    2. Learning machine operation, adjustment, etc. on with the actual running machine. This part is done while a qualification test is taking place and will continue about two to three weeks.

        Total duration will be four to five weeks (five days a week).

    3. Language:

        English is available without extra charge.

    4. Content of Schedule:

        A. Vendor shop training

            - Hot melt applicator (Nordson)
            - Control panel
            - Programmable controller

        B. Zuiko training

            - Converter

5. Cost of the Training:

   The cost of the training at the Manufacturer is included in the machine price, however the cost for vendors' training is additionally charged. Estimate of the cost is as follows:

   Training at vendors shop for:

   - Hot melt applicator
   - Control panel
   - Programmable controller

   YEN 2,800,000.-

   The following charge will be borne by the Customer:

   A. Round trip air fare from and to the customer's site
   B. Hotel accommodation
   C. Daily meals (except lunch)
   D. Local transportation

6. Persons recommended to attend the training:

One electrical engineer	One mechanical engineer
One operator leader	One product quality control person

   The project leader responsible for the project is invited to take part in the program, and then attend the qualification test.

SUPERVISORY SERVICES:

The Manufacturer shall dispatch their engineers to the Customer's plant to give instruction and advise on installation, adjustment and trial operation that the following fees and charges shall be borne by the Customer.

1. Round air fare from and to Japan and the customer's site
2. Hotel accommodation.
3. Daily meals.
4. Local traveling expense.
5. Medical care, if required, during engineer's stay.
6. All taxes, levies and duties to be imposed on engineer or supervisory services rendered, by your government or other competent authority, if any.
7. Absence fee to be calculated at YEN 85,000/day (8 working hours including lunch time/man/day)

ATTACHMENT 11

TECHNICAL SERVICE

ZUIKO'S PROPOSAL ON TECHNICAL SERVICE AFTER CONTRACT

1.TEST RUNNING AND ADJUSTMENT BEFORE DELIVERY:
The machine contracted shall be delivered after its completion of test running and adjustment with the raw materials supplied by the Purchaser, at ZUIKO's plant.

2.TRAINING:
ZUIKO, upon request, is ready to receive the personal of the Purchaser for the purpose of training and education on the operation of the machine at ZUIKO's plant free of charge during test running and adjustment of the machine before its delivery. However, round air-ticket, hotel accommodation fees, meals, inland transportation charge, etc. Shall be borne by the Purchaser for its own team.

3.INSTALLATION AND START-UP SUPERVISERS:
The service of ZUIKO's qualified supervisors to supervise the personnel of the Purchaser for installation and start-up at the Purchaser's plant is available based on the conditions indicated in ZUIKO's quotation.

4.WARRANTY PERIOD:
The warranty period shall be for a period of 12 months against any defect in materials and workmanship excluding consumables.

As for details of warranty, please see the separate sheet.

5.TROUBLE SHOOTING:
Information about troubles and damages of the machine if occurred, shall be conveyed to ZUIKO as precise as possible, irrespective of warranty period.

Upon receipt of such information in details, following action will be taken from ZUIKO:

1) Service work will be immediately initiated and any reply will be made within a working day by Fax or phone.

2) Specific reply in writing how to settle the trouble will be sent to the Purchaser within 2 working days by Fax.

3) In case it is difficult to settle the trouble by means of Fax communication, suitable personnel after consultation with the Purchaser will be sent to the Purchaser's plant without delay.

6.REPORT:
ZUIKO will submit to the Purchaser a report related to the result immediately after the settlement of the trouble.

7.PERIODICAL VISIT SERVICE:
ZUIKO will make a periodical visit once a year in average to the Purchaser for inspection of the machine in operation.

ATTACHMENT 12

FORM EXAMPLES

ZUIKO

CONTRACT CHANGE ORDER

Change order no:	Date:
Project name:	Reference to quotation/agreement:
Description of change:	
Influence on function, performance and delivery time:	
Cost, fixed price:	or estimated cost on open account:
Authorized PTB approval: Date:	Signature:
Authorized ZUIKO confirmation of the condition: Date:	Signature: