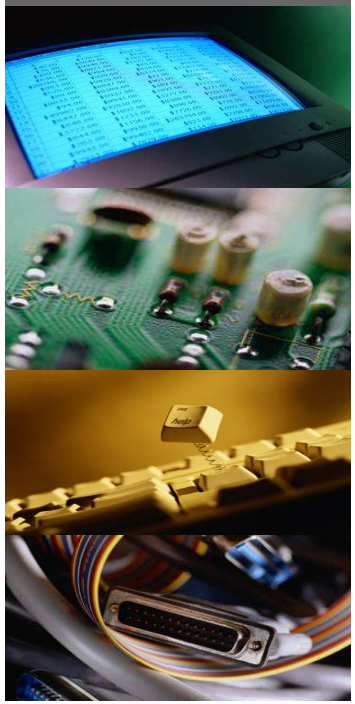

MECAPION

Total Solution
Encoder / SERVO Motor / SERVO Driver / Motion Controller / HMI

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http://www.mecapion.com

Automation market with rapid change

Now, new technology of MECAPION will supply the new paradigm for electric injection molding machine

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- R&D Plan for new items
- Case Study I & II
- Commercial Information (Price)
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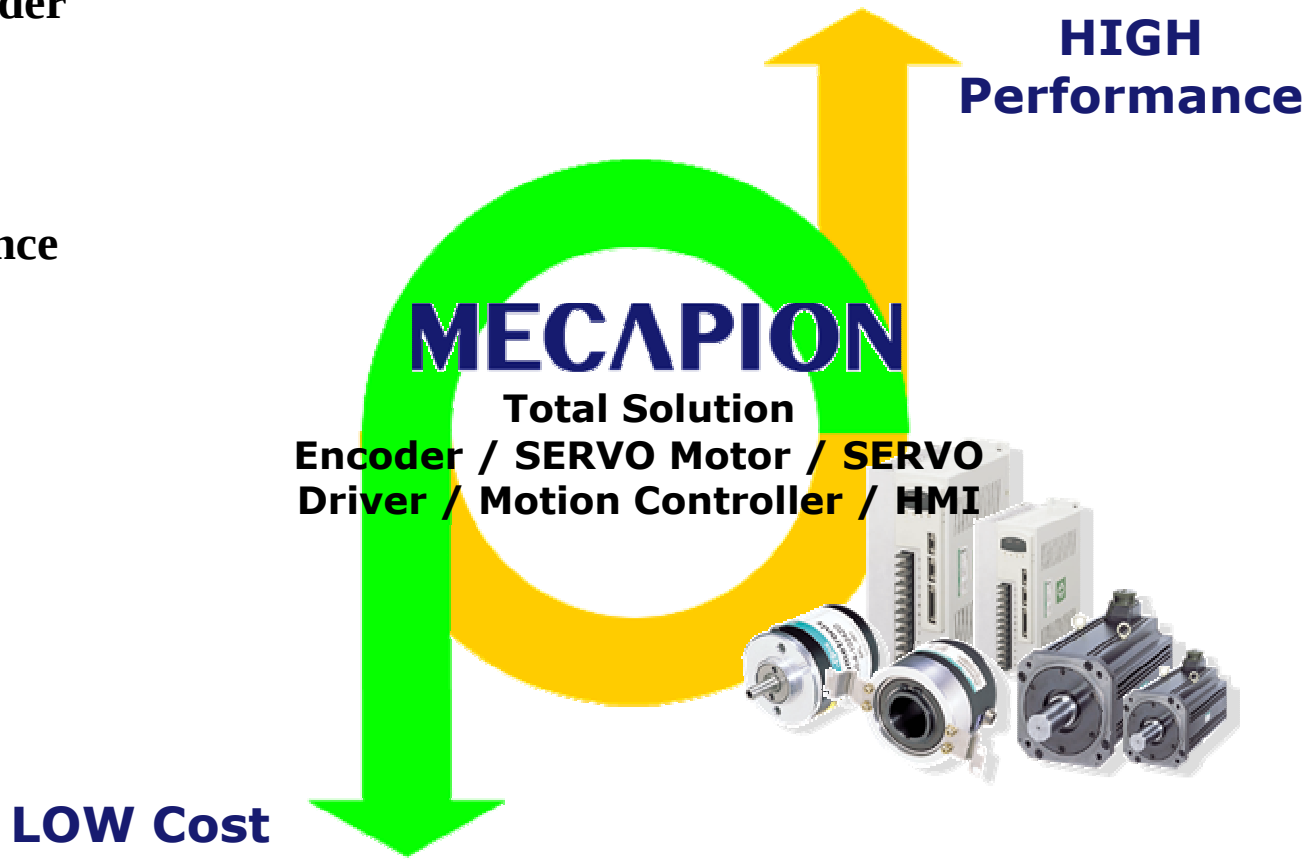
For various Needs of changeable injection molding machine market

MECAPION will be a new leader

Total Solution!!

With low cost, high performance



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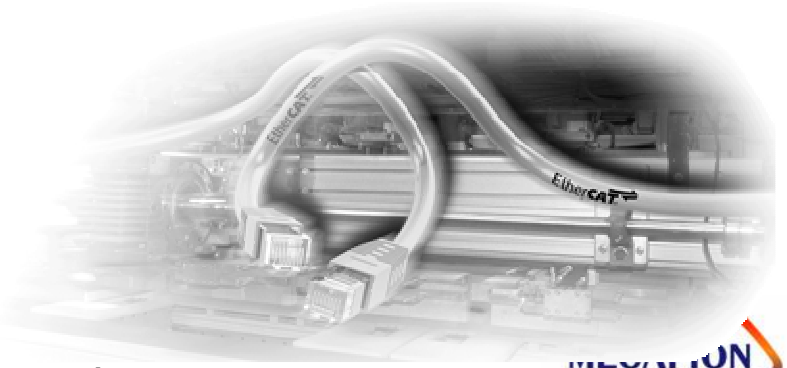
Trend of market

Change of injection molding machine market

- Change from hydraulic system to electric system
- Need various and mass production
- Need low cost & high performance for price competition
- Need high precision control

Technology innovation of MECAPION

- Flexible R&D and Production system to meet various customer needs
- Design Encoder, Secure know-how
- Design SERVO motor , SERVO driver, Secure know-how
- Total Solution for Motion control
- Various network
- Control with low cost & high performance



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Proposal

Proposal I. : Electric System

- Using high control based on PC
- Secure easy system by Network control platform
- Secure high speed master function and confidence, realize cost down by EtherCAT
- High capacity electic injection molding control by synchronized control

Proposal II. : Hybrid System

- Cost deduction with Energy saving
- Easy and precisely Control with Servo system
- Compact design with removing hydraulic system
- High quality injection molding controlled by high resolution servo system

Constant technology innovation!!

MECAPION will be a partner for injection molding control market

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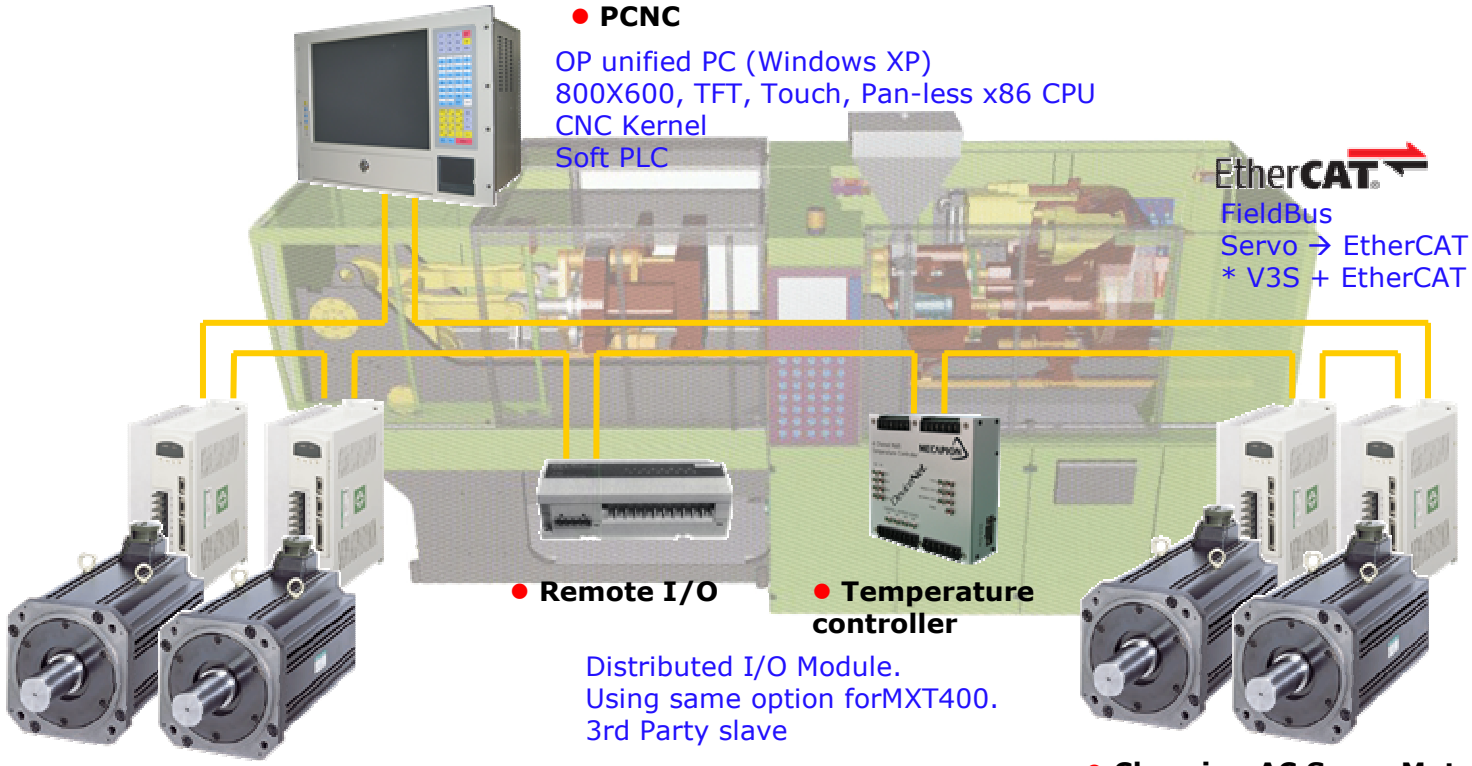
System architecture



- **PCNC**

OP unified PC (Windows XP)
800X600, TFT, Touch, Pan-less x86 CPU
CNC Kernel
Soft PLC

FieldBus
Servo → EtherCAT with CANOpen
* V3S + EtherCAT Option board

- **Remote I/O**
- **Temperature controller**

Distributed I/O Module.
Using same option forMXT400.
3rd Party slave

- **Ejector AC Servo Motor**
- **Tool clamping AC Servo Motor**
- **Charging AC Servo Motor**
- **Injection AC Servo Motor**

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- Realized synchronized control by using EtherCAT (100Mbps)
- High-capacity control system by using high speed communication servo
- Optimum environment by applying PC program
- Reduction system component cost for little additional cost
- Strong DATA management (Based on windows XP / PC hardware spec)

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Specifications (PC-NC Platform)

Technical Data	Target
Motion Block/sec (ISO)	2000
Max. feedrate along path at 1 um resolution	240m/min
No. of axes, max	72 (Max Motor Channel 64)
Display	10.4”(640·480), 12”(800·600)
CNC stations, max	8 channel (9 Axis per channel)
Axis interfaces	EtherCAT
NC program memory (RAM/HDD), max.	1MB/2GB
Look ahead buffering	256
PLC performance (1131-3) per 1000 instr.	40us
PLS-tasks	3 (start, low, high)
DIO	1024/1024
OS	XP + RTX
Target application	Injection machine, Router, Spring

※ The contents may be changed for improvement of function

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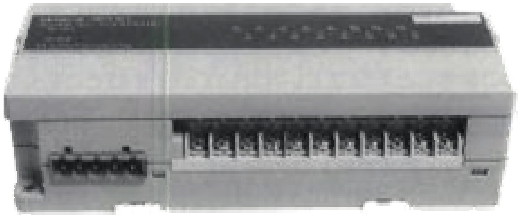
Remote I/O

DeviceNet

- Board size : 280 X 210 X 2t(4layer)
- Input connector : Terminal form 20Pin
- Output connector : Terminal form 24Pin
- Remote I/O connector : DeviceNet type
- Input point : Total 32point
  16/connector , 8 Common (Source Type : +Common)
- Output point : Total 32
  16/connector , 8 Common (Sink Type : -Common)



Temperature controller

DeviceNet

- Input power : DC24V, 300mA
- Input Type : J,K Thermo-couple
- Control temperature : 0~800℃,
- Input channel : 4CH
- Temperature control : ±0.1%
- Input current detect : 0~50A , Heater disconnect detect
- Rated output : 4Ch- Open Collector NPN output
- Output voltage : 0/24VDC
- Output load(max) : 600 Ω
- Output form :PWM (Resolution: 1msec, Cycle : 1sec)
- Status output : LED/CH,
- Support control : ON/OFF, NN(Auto Tuning)
- Device-Net : UCMM connector system

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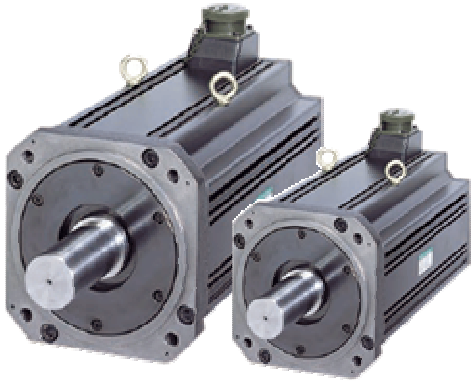
SERVO Driver

- Input power : AC 220V
- Communication port : EtherCat port
- Communication portocol : EtherCat
- Window : 7segment LED – Show servo operation
  4 LED – Communication state
  2 LED – Servo state
- Analogue input(2CH) – Load cell feedback & General
- Internal position control function included
- Direct pressure control function
- Programmable up to 8 user motion program
- 0.03kW~37kW / AC 220V(3phase)



SERVO Motor

- Rated ouptut
  Low pressure 11kW/7.5kW/3.5kW/11kW
  High pressure 15kW/7.5kW/3.5kW/11kW
- Rated rpm : 1500~2000rpm
- Encoder : 4096 pulse/rev absolute
- 0.03kW~37kW / AC 220V 3phase
  (For more spec, refer to the manual)

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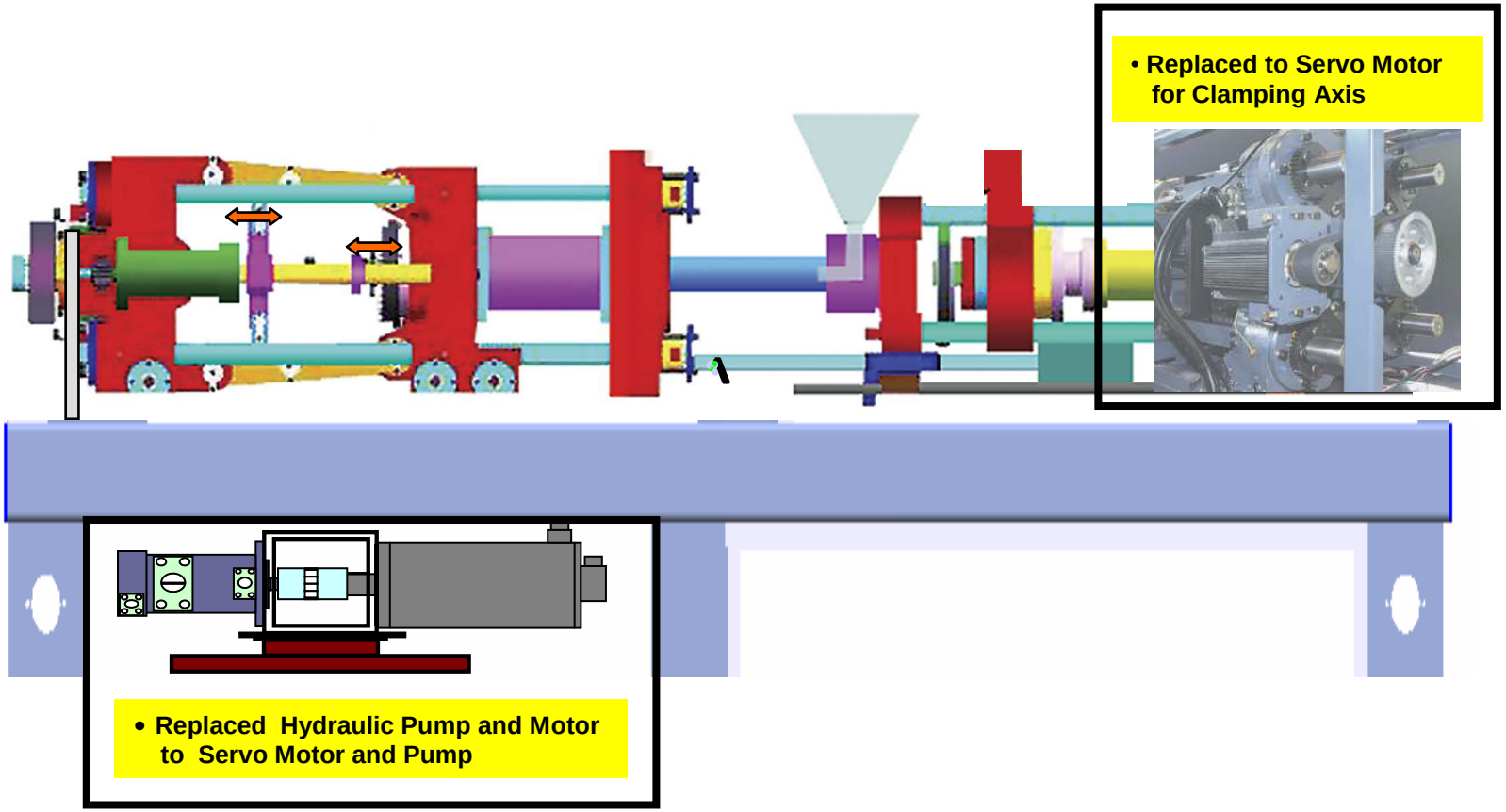
System architecture

Proposal. II



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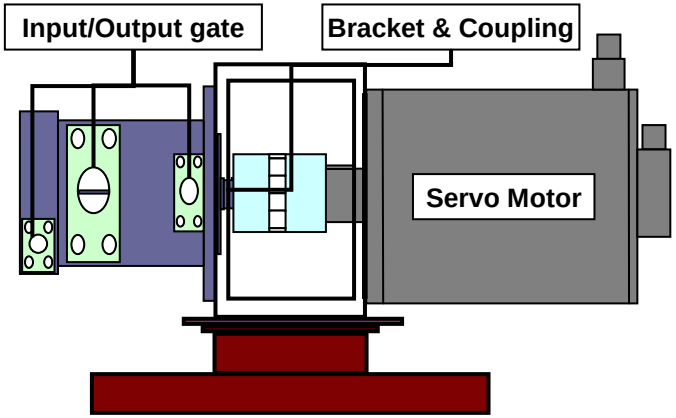
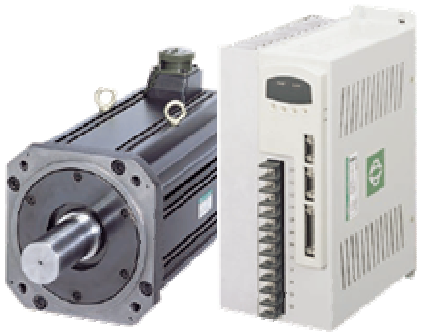
System architecture



- Servo Motor type pump for Energy saving
- Applied Motor specification for Injection molding machine
  - 80Ton : 11KW with Pump
  - 110 & 130Ton : 15KW with Pump
  - 170Ton : 22KW with Pump
- Rated rpm : 1500~2000rpm
- Encoder : 3,000 pulse/rev
- 50% of Energy saving compare with Hydraulic pump Sys.



- Servo System for Charging Axis for Precision & High Speed
- Applied Motor specification for Injection molding machine
  - 125 & 150Ton : 11KW servo system
  - 200Ton : 15KW servo system
  - 300Ton : 37KW servo system
- Rated rpm : 1500~2000rpm
- Encoder : 3,000 pulse/rev
- High precision and Fast cycle time

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R&D Plan for new items

Product	2008 (2/4)	2008 (4/4)	2009(2/4)	2009(4/4)	Etc.
PCNC Based on EtherCAT					Including Field Test period
EtherCAT AC220V/AC380V SERVO DRIVER					Full Line-up
DeviceNet AC 220V/AC 380V SERVO DRIVER					Full Line-up
EtherCAT based Remote I/O					Same I/O Point No. I : 32point O: 32point
EtherCAT based Temperature Module					
AC 380V SERVO DRIVER					Full Line-up // RS323 & RS485
AC 380V SERVO Motor					Full Line-up // Parallel Type
Hybrid Pump System					Pump and Servo system

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Electric Injection Molding Machine

● LSC HISTORY

• Start Electric Injection Molding Machine system development
- 2nd half of 2003 : System development based on Yaskawa system
- 1st half of2004 : Start test with initial sample of 50Ton application
- 2nd half of 2004 : Apply mass production
- 2nd half of 2005 : Start developing for controller
- 1st half of 2007 : Start developing for 380V
- 2nd half of 2007 : On field test after completing controller

• Electric Injection Molding Machine present condition
- Develop total control system for example Controller, Servo system, OP panel, Temperature controller by cost deduction and mass production

- Composition Injection Molding Machine for 4 axes
  ➔CLAMPING, EXTRUSION, INJECTOR, CHARGING
  ➔ Servo system : 1.0KW~37KW / Application : 30TON~300TON

- 2nd half of 2006 : Increased volume by secure servo and control system and reasonable price competition
- 2007 : Supplied about 270 set to LSC

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DHC HISTORY

- Start system development for cost down and secure technology
  - 1st half of 2007 : Apply Mecapion servo system for 2 colors injection molding Machine
    ➔ 85TON,130TON,180TON
  - 2nd half of 2007 : Apply Mecapion servo system for Hybrid injection molding machine
    ➔ Display in K-2007
  - 2nd half of 2007 : Having system development for cost down and secure technology

Electric Injection Molding Machine for 2 colors / 2 material

2 colors Machine (85ton,130ton,200ton)

Circumference deviation : 0.01mm

Servo drive for high precision position control

Hybrid Electric Injection Molding Machine

Ultra high speed and precision (170ton)

High precision compare with Vector motor

Improve productivity by improved cycle time

Competitive price

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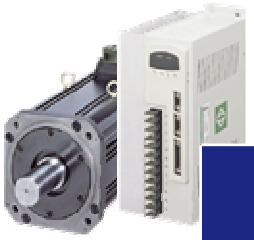
Commercial information

Application	Item	Model name	Specification	PRICE(FOB Korea)
Position sensing	Rotary Encoder	S40-6-XXXXVL	Line driver type(5VDC)	USD50.0 ~USD55.0



Machine	Model name				Total Price (USD)
	Clamping	Extrusion	Injection	Charging	
30 Ton	SF30G/VS35	SE09G/VS10	SF60G/VS110	SF30M/VS35	USD5,106.6
50 Ton	SF44G/VS50	SF20G/VS20	SF60G/VS110	SF44M/VS50	USD6,639.5
80 Ton	SF44G/VS50	SF20G/VS20	SG75G/VS110	SF44M/VS50	USD7,025.0
110Ton	SF75G/VS110	SF30G/VS35	SG75G/VS110	SF60M/VS75	USD8,031.9
150 Ton	SG110G/VS150	SF44M/VS50	SG150/VS150	SF110G/VS150G	USD11,746.7

- Input Power : 3Phase AC 220V
- Option (Cable, Connector and Braking Resistor) is not included in above price
- Encoder : 3000ppr / rev. of Incremental encoder
  (If customer request different specification of encoder such as absolute or serial encoder, there will be additional cost…)
- Above specification is our standard specification. So, After getting inquiry from customer's side, we can submit actual offer.
  So just keep above price as your reference

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MECAPION

Contact Us

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  Dalseo-Gu,Daegu,Korea 704-240
- Tel : 82-53-593-0066 Fax : 82-53-593-8614

- Oversea Business Office

Manager : Mr. K.K.Lee
Tel : 82-53-580-9104
E-mail : kklee@mecapion.com

2. Subsidiary company (China Factory)

- Name : WUXI MECAPION MACHINERY&ELECTRICAL CO.,LTD.
- Address : 240-1, Xida Road, Maicun Industrial Center
  Xingu, Wuxi, Jiansu, China.

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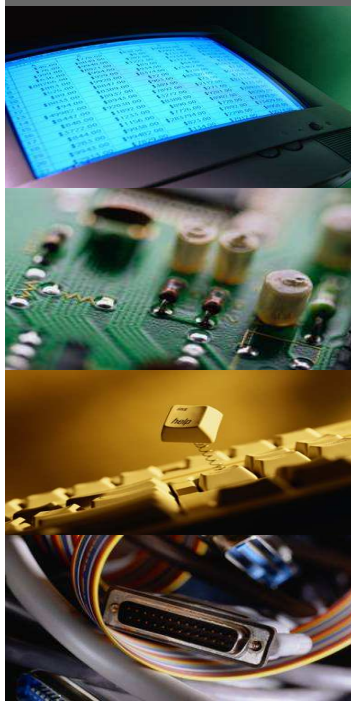

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