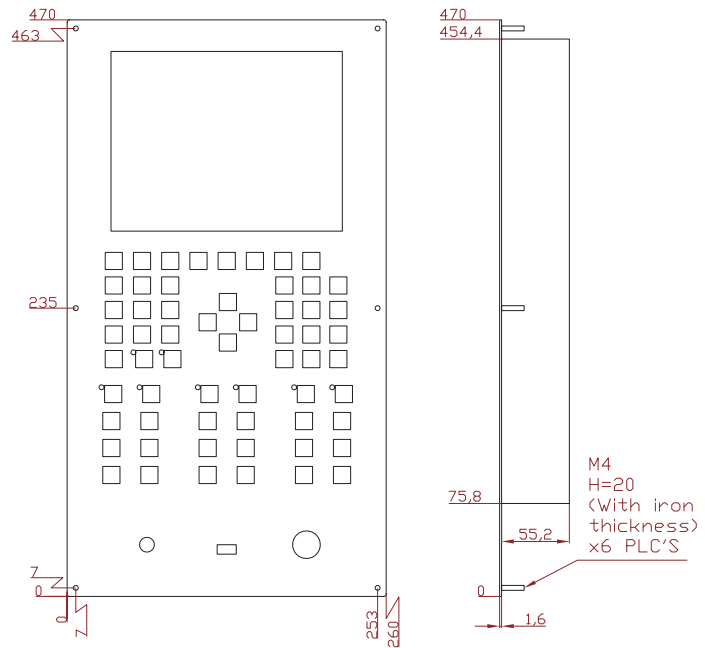
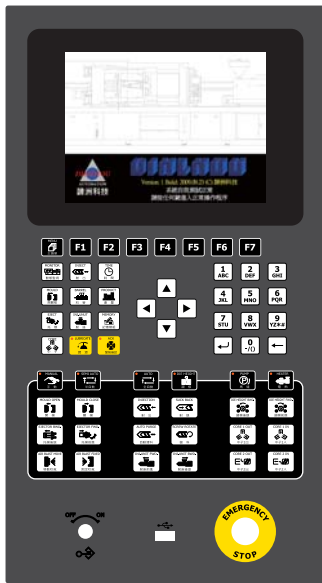


# AF1 Specification



## Host controller

▶ Dimension	326mm*221.6mm*42.5mm
▶ Input voltage	90~240Vac±15%, 50/60Hz
▶ Humidity	85%RH@40°C
▶ Working temperature	0~65°C (32~150°F)
▶ Store temperature	-40~85°C (-104~185°F)

## Human interface

▶ Dimension	470mm*260mm*56.8mm
▶ Input voltage	+5Vdc , +12Vdc
▶ Humidity	85%RH@40°C
▶ Working temperature	0~65°C (32~150°F)
▶ Store temperature	-40~85°C (-104~185°F)
▶ Human interface system	80C186ES (16bit@80MHz)
▶ Display resolution	8" TFT LCD (Resolution 800*600 pixels), LED backlight
▶ Push button	Tactile switch with film touch
▶ Touch panel	4-Wire resistive touchscreen(option)

## CPU1

▶ Central processes	80C186ES (16bit@80MHz)
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## Human interface system

▶ CPU2 Displays/Memory/Keyboard control	80C186ES (16bit@80MHz)
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▼ Capacity of memory modules	
▶ Memory module	NVSRAM
▶ Capacity	80ea(Standard)
▼ USB interface	
▶ Processor	PIC 24FJ64GB106
▶ Ram	16K
▶ Rom	64K
▶ USB storage	1 million modules on system memory
▼ Human interface	
▶ Connector	9pin DB male & 6 pin x 2.5mm male
▶ Transmission protocol	RS232C
▶ Realtime clock	24 hours
▶ Multi-language support	The standard 6 kinds (Chinese and English, reserve 4 kinds), most expand to 10 kinds

### ■ Temperature control board

▶ Channels	8
▶ Heater channels	7
▶ Oil channel	1
▶ Accuracy	0.1°C
▶ Control manner	Fuzzy PID theory
▶ Inaccurate range	0.25%@±1°C
▶ Temperature range	K type 0~400°C
▶ Alarm	High/Low limit TBO: Temperature probe open OPN: Heater open
▶ Grounding	250Vac@60Hz
▶ Multi-point grounding	125Vac 250ma@60Hz

### ■ Analog input: Position & pressure sensor

▶ Input ports	Position sensor x 4, Pressure sensor x 3
▶ Mould	Port1
▶ Inject pressure	Port2
▶ Screw Port	Port3
▶ Eject position	Port4
▶ Mould pressure	Port5
▶ Inject Unit	Port6
▶ System pressure	Port7
▶ Resolution	16bits(0~65535 each ports)
▶ Calibrate	Completely software calibration
▶ Provided power	+9.45Vdc/10ma@3500Ω
▶ Accuracy	0.01mm

### ■ Analog output: Controlled proportional valve

▶ Standard control	Pressure, Speed, Back pressure (2 ports expandable)
▶ Resolution	12bits(0~4095 each ports)
▶ Precision	0.1kg/cm <sup>2</sup> / 1psi and 0.1%
▶ Voltage control	+10Vds (±10Vds optional)

▶ Current control	+1Adc
▶ Full scale linear calibration	Software calibration
▶ Slope control	256 stages on software calibration, reaction time as 0.01 second

## External input port

▶ Standard: ports	32 (Expandable 16 points to 48 points)
▶ Indicator	Green LED
▶ Working voltage	24Vdc±10%
▶ Input current	24Vdc@10ma
▶ Isolation	Optical couple
▶ Power source	24Vdc @14.6A

## External output port

▶ Standard: ports	DC:26(Expandable 16 points to 42 points), RELAY:6
▶ Isolation	Optical couple
▶ DC driver IC	MOSFET@9A
▶ DC least load	5mA
▶ DC full load	1.8A(Continuous full load test)
▶ DC maximum peak current	5A
▶ DC indicator	Red LED
▶ Relay operating voltage range	120~250Vac, 18~32Vdc
▶ Relay least load current	10mAac, 10mAdc
▶ Relay full load current	3Aac / 5Adc(Continuous full load test)
▶ Relay maximum peak current	5Aac / 8Adc
▶ RELAY indicator	Yellow LED
▶ Power source	Switching power supply 24Vdc @14.6A

## Automatic power on

▶ Auto power on time setting	One week
▶ Battery	DC9V Battery

## System power

▶ Power source	Switching power supply
▶ Input	90~24Vac+15%, 50/60Hz
▶ Output	+5Vdc@5A, +12Vdc@2.5A, -12Vdc@0.5A

## Input/Output power

▶ Power source	Switching power supply
▶ Input	88~132Vac/176~264Vac, 50/60Hz
▶ Output	+24Vdc@14.6A

## Analog power supply

▶ Power rectifier PCB	+15Vdc :2A, +48Vdc :3A
▶ Transformer DZ-TR3	Input: 220Vac±15%, 50/60Hz Output: 38Vac/16Vac

## ■ Dual CPU realtime multi-task control system

- ▶ CPU1(80C186ES-80Mhz-16Bit): Pressure, Speed rate, Input/Output control, Temperature, Position sensor
- ▶ CPU2(80C186ES-80Mhz-16Bit): Display control, System memory on NVSRAM:80 modules, USB:1 million modules
- ▶ TFT 10.4"(640\*480), DSTN 7.5" color LCD(640\*480), TFT 8" color LCD(800\*600)
- ▶ Power on self-test function, make maintain service easily
- ▶ Guidance operation system, always hints the high/low range and running message on each setting value
- ▶ Simply operation menu, including operator menu, engineering menu
- ▶ All molding control designed as function selection, easy to operate

## ■ Software alignment function for analog input signal positioning control

- ▶ 4 position sensor input, concurrence A/D transform, contrast and display 1.Mould open/close 2.Injection 3. Ejector 4. Injection units
- ▶ 3 pressure sensor input 1. Mould pressure 2. Injection 3. System pressure
- ▶ Software aligns linearity and proportional of position sensor, input value by control panel, easy to assemble
- ▶ Auto converse setting unit between millimeter and inch
- ▶ Lack or over volume detection on injection destination
- ▶ Dynamic graphics display for mould open/close & injection Screw position
- ▶ Enhance hardware scaling to 0.01 millimeter

## ■ Proportiona integral derivative(PID) temperature controller

- ▶ 7 channels of temperature control, 1 channel oil temperature control
- ▶ Setting High/Low limit, thermal and alarm control on each channel
- ▶ Heater open, temperature probe open detection and alarm
- ▶ Oil preheat, cooler and over limit alarm control
- ▶ Screw cold start protection time
- ▶ One week schedule for system preheat and auto power on

## ■ High precision PWM on pressure and speed control

- ▶ PWM control(DITHER) correspond to YUKEN, DAIKEN...BOSCH curve design rule, fully linearization
- ▶ Software sloping control (1/1000 second, 256 stage), slope time setting on each output pressure control
- ▶ Auto converse setting unit between kg/cm<sup>2</sup>(140-210) and PSI(2000-3000)

## ■ 3 channels for output voltage and current control(2 ports expandable)

- ▶ CH1: Proportionable pressure control (DC0~10V, DC0~1A) (Optional ±10Vds)
- ▶ CH2: Proportionable speed control (DC0~10V, DC0~1A) (Optional ±10Vds)
- ▶ CH3: Proportionable back pressure control (DC0~10V, DC0~1A) (Optional ±10Vds)

## ■ Closed loop control on injection system

- ▶ Injection speed and back pressure closed loop control
- ▶ Injection control before holding use 3 method 1. Position 2. Time 3. Pressure
- ▶ Auto alignment injection end position
- ▶ Monitor and alarm for setting value & dynamic curves(Oil pressure sensor)
- ▶ Graphics monitor and alarm for injection speed, holding, screw rotate and back pressure

## ■ SPC circle trace & record

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- ▶ Trace record 12 datas at the same time, provide quality analysis and graphic report of finished products
  - ▶ Statistical table (bar-chart graphic) of average value of 12 datas
  - ▶ Tendency chart of standard deviation of 12 datas
  - ▶ Track record 300 modules continuously, using intermittent and record cycle control, extend records from weeks to one year
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## ■ Human interface

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- ▶ Using RS-232 communication interface between HMI and PLC for long distance transmission
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## ■ Special software features

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- ▶ Variable speed during eject, eject by air pressure
  - ▶ Dual-core function
  - ▶ Injection unit action : Inactive, Injection unit backward after suck back, Injection unit backward after cooling down
  - ▶ Auto die-height function : Auto detect thickness of mould, setting high/low pressure position and time
  - ▶ Holding or sloping action are selectable for holding function
  - ▶ Suck back after screw rotated or suck back after cooled down
  - ▶ Post suck back and Pre-screw rotate control function
  - ▶ Cooling down after injection end or screw rotated
  - ▶ Auto purge contents function
  - ▶ Purge PVC and cooling FAN function
  - ▶ Control of mould/package mould counts, alarm or auto reset count while reach the quantity
  - ▶ Auto record motion time of machine by setting record periods
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## ■ AF-1001 CPU1, analog input

- ▶ 80c186ES-16 Bits@80MHz
- ▶ Programmable logic control, 60ns cycle time for each instruction
- ▶ Power on self-test function

## ■ AF-1002, LCD driving interface

- ▶ 80c186ES-16 Bits@80MHz
- ▶ PIC 24F64GB
- ▶ Keyboard control interface
- ▶ 10.4" TFT LCD / 8" TFT LCD / 7.5" DSTN LCD display
- ▶ 80 modules on system memory
- ▶ 24-hour time clock
- ▶ Auto power on, Preheat function
- ▶ 4-Wire resistive touchscreen
- ▶ USB interface (Software updates, extended system memory)
- ▶ LCD back light driving
- ▶ Keyboard decoding
- ▶ Indicator output control
- ▶ RS-232 human interface communication

## ■ AF-1018 keyboard input

- ▶ Switchable button

## ■ AF-1003 Temperature control, analog output/input control

- ▶ 16 Bits A/D
- ▶ Fuzzy PID control
- ▶ 8 ports for k type thermal couple input
- ▶ 0-400°C control range
- ▶ 8 ports for SSR output
- ▶ Software ramping control
- ▶ Pressure: 12 Bits D/A
- ▶ Speed: 12 Bits D/A
- ▶ Back pressure: 12 Bits D/A
- ▶ 0~10Vdc voltage out control (optional ±10Vds)
- ▶ 0~1Adc current output control
- ▶ Dither control
- ▶ Ramping adjustable for pressure, speed, back pressure
- ▶ 4 input ports for position sensor
- ▶ 3 input ports for pressure sensor

## ■ Input

- ▶ 32 input ports, Optical couple isolation
- ▶ Working voltage: +24Vdc ±10%
- ▶ Input current: +24Vdc +10mA
- ▶ 4 high speed counter ports, 1 screw rotate RPM port
- ▶ Adjustable input port function

## ■ Output

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- ▶ 26 output ports with +24Vdc(Expandable 16 points to 42 points), Optical couple isolation
  - ▶ 6 ports AC220V or DC+24V relay driver
  - ▶ Short-circuit protect function
  - ▶ Adjustable output port function
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## ■ USB standard

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- ▶ USB v2.0 & v1.1 Compliant
  - ▶ Support FAT32 & FAT16
  - ▶ Overview 1.3 2008, follow [www.usb.org](http://www.usb.org) Mass Storage Class Specification Overview 1.3 2008
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