

Preliminary

Reference

Specifications of SJ700 Inverter

Jul.17.2007

Design Concept



High performance & Many useful Functions
but User Friendly

● **Feature**

1. Easy to adjust for high performance Sensorless Vector control --- Robustness

- Torque Performance: 200% at 0.3Hz (Sensorless Vector up to 55kW)
- 0Hz Domain Sensorless Vector Control: 150% at 0Hz (One frame down motor)
- Robust Vector control which is less sensitive to motor constants
- High accuracy & Useful Auto-tuning function
- High Response current control (target: 300 μ s \rightarrow 100 μ s)
- Full Vector Control with Feedback option
(Range 1:1000, Response 80Hz, Torque Control, Position Control)

2. Abundant useful functions which customers are satisfied with
Mixture specifications both SJ200 and SJ300

- Standard RS485 --- Install both Modbus-RTU and Hitachi protocol
- Programming Function --- support the language like Visual Basic (512 step)
- Reliability and Easy Maintenance

3. Internal Option

- Internal Braking Circuit will be installed up to 22kW
- EMI Filter will be installed (Category C3) up to 132kW

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Standard Specifications

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1. Input & Output Power Specifications

Voltage		200V class			400V class		
	Model Name SJ700-xxxxxx	004 LFF	~	550 LFF	007 HFF	~	550 HFF
Rated output	MAX.Applicate Motor (kW)	0.2	~	55	7.5	~	55
	Rated output current (A)	1.6	~	220	2.5	~	110
	Rated output Voltage (V)	3 phase 200 to 240V (Depending on input voltage)			3 phase 380 to 480V (Depending on input voltage)		
	Output Frequency Range (Hz)	0.5 to 400 Hz					
Rated Input	Rated AC Voltage (V) / Frequency(Hz)	3 phase 200 ~ 240 Vac 50/60 Hz			3 phase 380/400/415/480 Vac		
	Acceptable accuracy of Input power	Voltage : +10%/-15%, Frequency: +/- 5%					

Note 1 : Neutral point should be connected to earth for 3-phase power supply (for Low voltage directive)

Note 2 :

380 to 460Vac--- Over voltage category III.

460 to 480Vac---Over voltage category II. (To meet over voltage category III, insert an EN or IEC standard compliant earthed star connection isolation transformer in the input of the Inverter.) (for Low Voltage Directive)

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2. Control System

Item		Contents
Control specifications	Control system	Sin-wave modulation PWM
		Carrier Frequency 0.5 to 15kHz(default setting:5kHz) (higher carrier frequency needs to be derating current or temperature)
	Frequency accuracy	$\pm 0.01\%$ (Digital)、 $\pm 0.2\%$ (Analog) for Max. frequency
	Overload current rate	150% for 60 sec., 200% for 3.0sec.(up to 55kW), 180% for 10 sec. (75kW and above)
	Torque characteristic	High response sensorless Vector Control, 0 Hz domain sensorless Vector control and V/F control
		Starting Torque 200% at 0.5Hz (up to 55kW), 180% at 0.5Hz(75kW and above)
		Starting torque 150%(up to 55kW)/130%(75kW and above) at 0Hz(0 Hz domain sensorless Vector control and at the time of 1 frame under motor connection)
	Dynamic braking (with external resister)	Approx. 150 to 80% Braking control circuit install in the inverter up to 22kW
	DC braking	Starting frequency of DC breaking 0.5 to 400Hz
		DC braking 0 to 100%
		DC braking time 0 to 60 seconds
	Acceleration/ Deceleration time	0.01 to 3600 seconds
		Linear/S-curve/U-curve/Reverse U-curve/S-curve for Elevator pattern
		2 nd stage acceleration and deceleration
	V/F characteristic	Constant torque, Reducing torque
		Free V/F characteristic(7 setting points)
	Overload restriction	Setting level: 20 to 200%(180% for 75kW and above) (current restriction)
		Frequency Control for over voltage
		Output Control for over current

3.Interface(1)

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Item			Contents
Interface (1)	Input	Frequency setting	Standard Operator (Removal)
			Setting by UP-key and DOWN -key
			Setting by potentiometer
			Input from outside
			0 to 10VDC,-10 to +10VDC(Input impedance:10k Ω), 4 to 20 mA (Input impedance:100 Ω)
			Setting by Multi-speed:16 speeds(By using intelligent input terminal) RS485 serial communication (by using terminal) Protocol: Modbus RTU or ASCII based communication can be chosen Communication speed: 19.2kbps max. Pulse Train(0.1-50kHz) (by using SJ-FB Option)
		RUN/stop command	Standard Operator (Removal)
			Setting by RUN-key and STOP -key
			Input from outside
			Forward (FW), Reverse (REV) signal Three-wire(RUN,FW/REV,STOP) RS485 serial communication (by using terminal) Protocol: Modbus RTU or Hitachi Original(ASCII based) can be chosen Communication speed: 19.2kbps max.
		Input terminal	Intelligent input digital terminal
			8 digital input terminals (Input terminal impedance:4.7k Ω), 1 thermistor input 24Vdc power interface Both sink type input and source type input are available Functions: FW,RV,CF1-4,SF1-7,JG,FRS,2CH,DB,SFT,EXT,SET, SET3,CS,CAS,OLR,UP,DWN,,AT,STA,STP,F/R,PID,PIDC,TRQ1, TRQ2,USP,RS,PPI,BOK,OPE,ORT,LAC,PCLR,STAT,n ϕ ADD,F-TM,ATR,KHC,SON,FOC,UDC,TL, MI1-8
			Analog Input
			Voltage input: 2 terminals(O,O2 terminal) Current input: 1 terminal (OI terminal) Resolution of analog input: 12 bits Frequency setting / PID function(Target or Feedback signal)

Prepared removable terminal same as current SJ300 and L300P

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4.Interface(2)

Item				Contents
Interface(2)	Output	Terminal	Intelligent Output Terminal	5 open-collector type output with calculation function(AND,OR,XOR) and ON/OFF delay function Both sink type and source type are available. 27Vdc 50mA max.
				1c Relay output (AL2, AL1, AL0) with calculation function(AND,OR,XOR) and ON/OFF delay function 250Vac/30Vdc @1.0A resistive load
				Functions: RUN,FA1-5,OL,OL2,AL,OD,OTQ,IP,UV, TRQ,RNT,ONT,THM,BRK,BER,ZS,DSE,POK, DOc,FBV,NDc,LOG1-5,WAC,WAF,FR,OHF, MO1-6,LOC,IRDY,FWR RVR
		Analog Output	1 pure analog voltage output(0 to 10V), 1 pure analog current output (4 to 20mA), 1 pulse train output(FM)	
			Output resolution : 10bits	
			Monitor: Output frequency, Motor current, Motor torque, Output voltage, Input electric power, Thermal load ratio, LAD frequency, Cooling Fin temperature, Motor torque(signed)	
Functions				AVR, V/f free setting, Torque control (by using SJ-FB) Accel. / Decel. Curve(S/U/reverse U/EL-S) selection, 2 nd Accel/Decel Frequency upper/ lower limiter Multi speed(16 different fixed target frequency) Carrier frequency (0-5-15kHz) PID function(setpoint function,reverse PID function) Jump frequency, External frequency input bias start/end, Jogging, Cooling fan ON/OFF control, Software rock, Trip history
Easy Sequence Function (Programming Function)				Programming Function like Visual Basic Language 512 steps (Timer, I/O control, Easy Process control etc.)

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5. Protection Function

Item	Contents
Protection	Over current
	Over voltage
	Under voltage
	Over load(electronic thermal function)
	Thermal Trip
	Ground fault on starting(at power on)
	Overload restriction
	Incoming over voltage
	External error
	Memory error (EEPROM)
	CT error
	CPU error
	USP error (Unattended start protection error)
	Braking resistor overload protection
	Phase failure detection
	Thermistor error
	Instantaneous power failure
	Expansion(option) card error
	Trip history
	Emergency Stop

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6.Operator Interface

	Item	Contents
Operator specifications	Operation and Display	Same as current SJ300 and L300P
	Programming	Setting parameter and Monitor
		Error display
	Monitor function	Output frequency
		Output current
		Frequency conversion monitor
		Intelligent input/output terminal monitor
		Operation direction monitor
		PID feedback monitor
		Motor torque monitor
		Output voltage monitor
		Input power(kW)
		Integrated Input power(kWh)
		Trip monitor(trip count, trip event)
		Warning monitor
		Accumulated time during RUN time and Power ON
		Cooling fin temperature

7.Environment and Option

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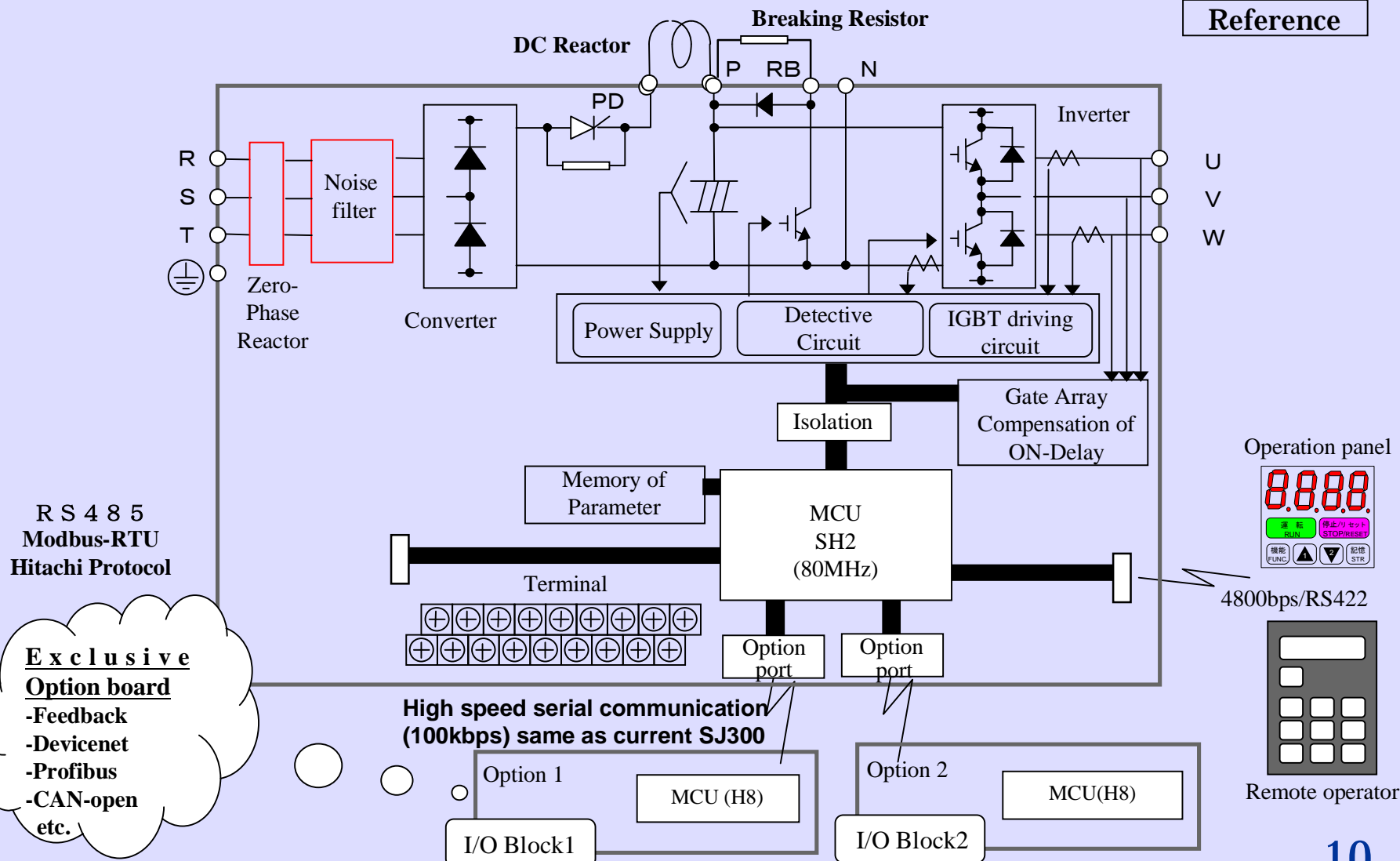
Reference

Item	Contents
Enclosure	IP20
Ambient temperature At operating	-10 to 40 °C, without derating -10 to 50 °C, with derating(output current or carrier frequency)
Ambient temperature At preservation	-20 to 65 °C
Humidity	20 to 90% RH (install with no dew condensation)
Vibration	5.9 m/s ² (0.6G) 10 to 55Hz(up to 22kW), 2.94 m/s ² (0.3G) 10 to 55Hz(30kW and above)
Location	Altitude 1,000m or less, indoors(no corrosive gases or dust)
Installed Item	EMI Filter(Category C3)~132kW Zero-Phase Reactor
Design Life of Parts	Capacitor Life: 10 years Cooling Fan Life: 10 years
Option	2 option board can be installed -open network---Device net(SJ-DN), Profibus-DP(SJ-PB(T)), CAN-open, LONWORKS(SJ-LW) -Feedback (SJ-FB,SJ-FBT:Note1), Digital input(SJ-DG) -other application board (study from market needs) Input choke, Output choke EMC Filter (class B) Copy unit (SRW-0J) Operator cable(ICS-1, 3) PC software (ProDrive) Braking resistor PC software and Cable for Easy Sequence Function

Note 1 : SJ-FBT need 2 option card space.

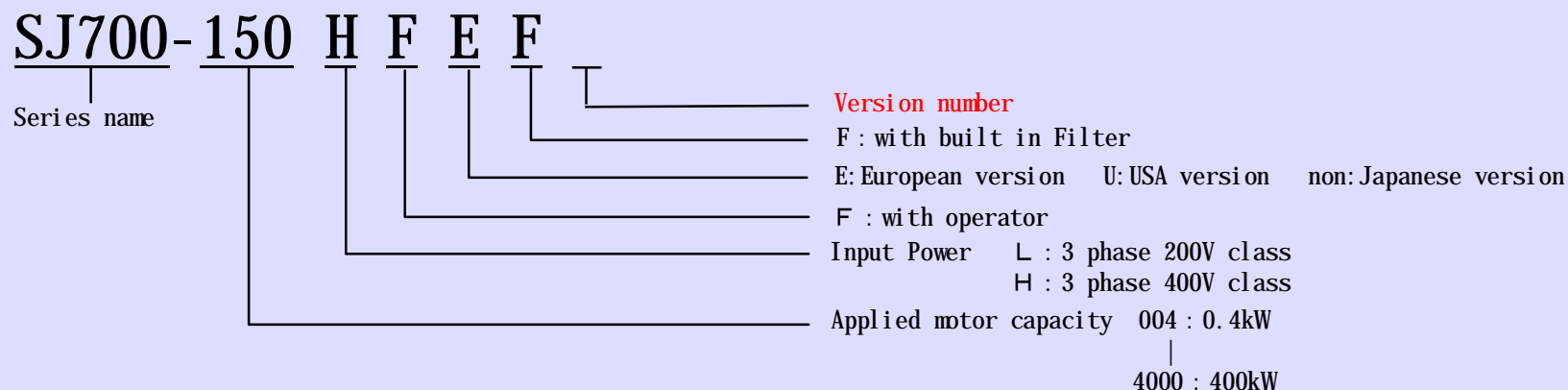
Image Block Diagram of Next SJ700

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9. Model Name & Series

■ Model name

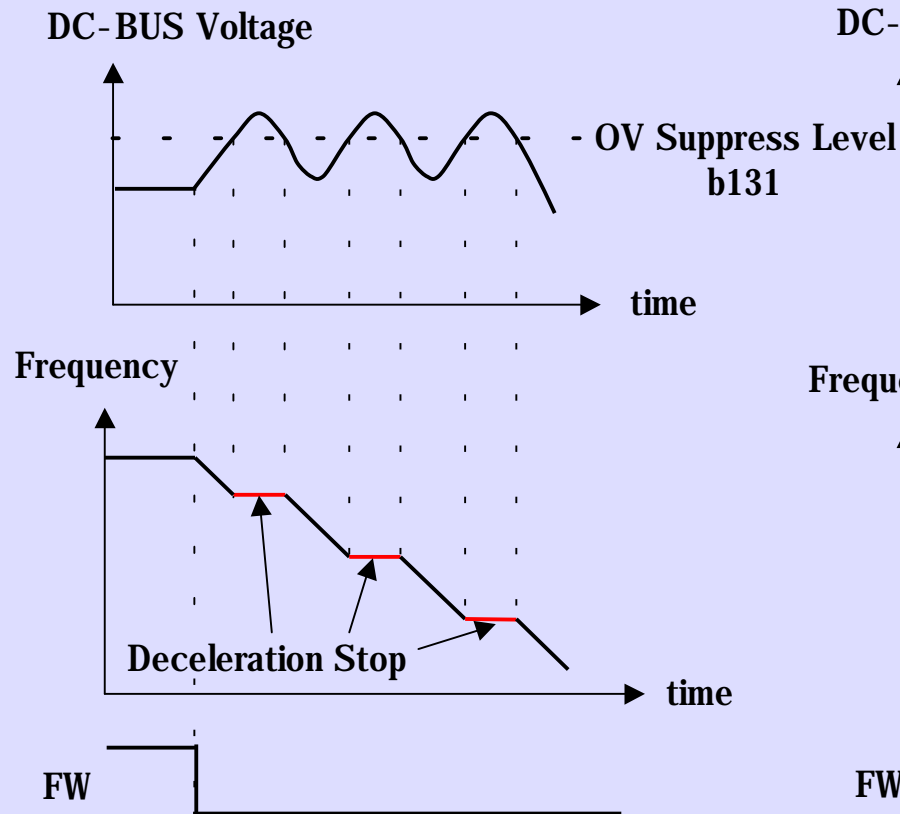


■ List of Model

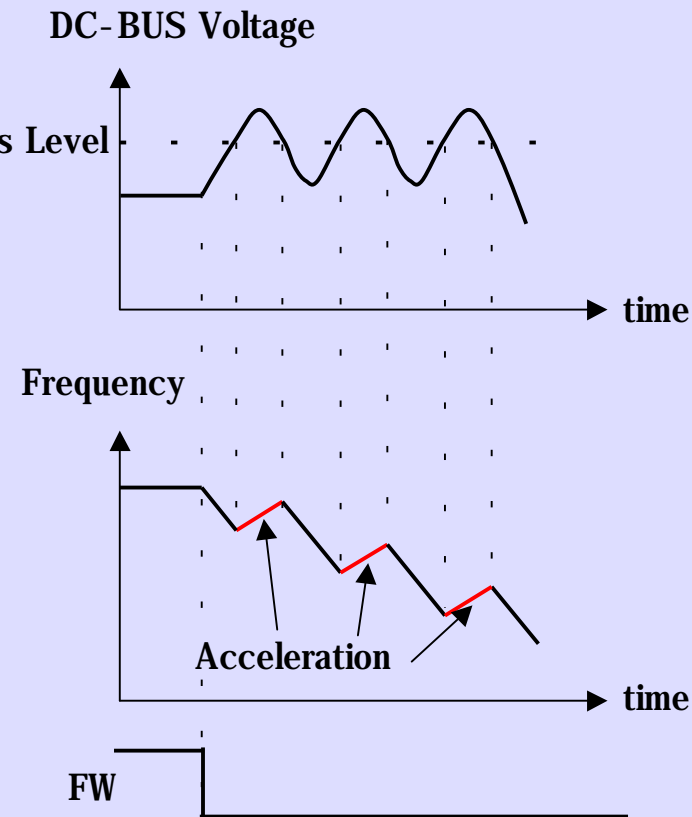
Motor capacity (kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	185	280	400	
200V class	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
400V class		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Add1. OV Suppress Function

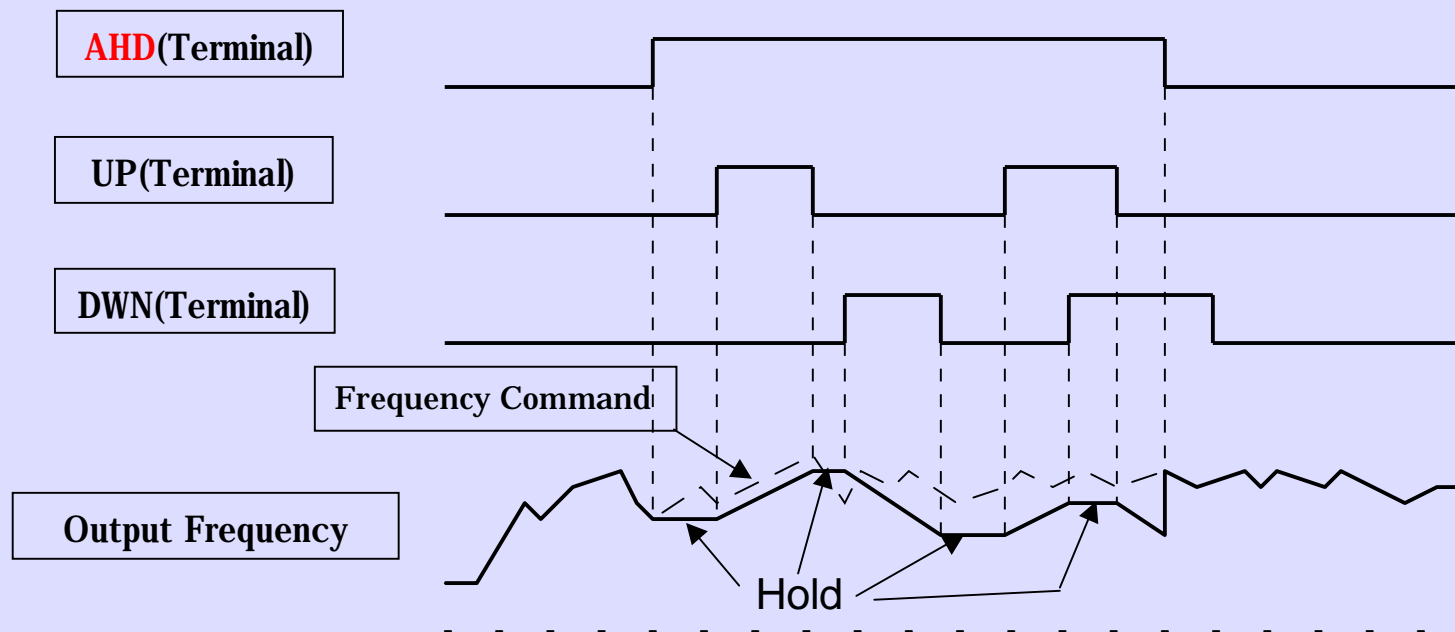
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b130:[02]select

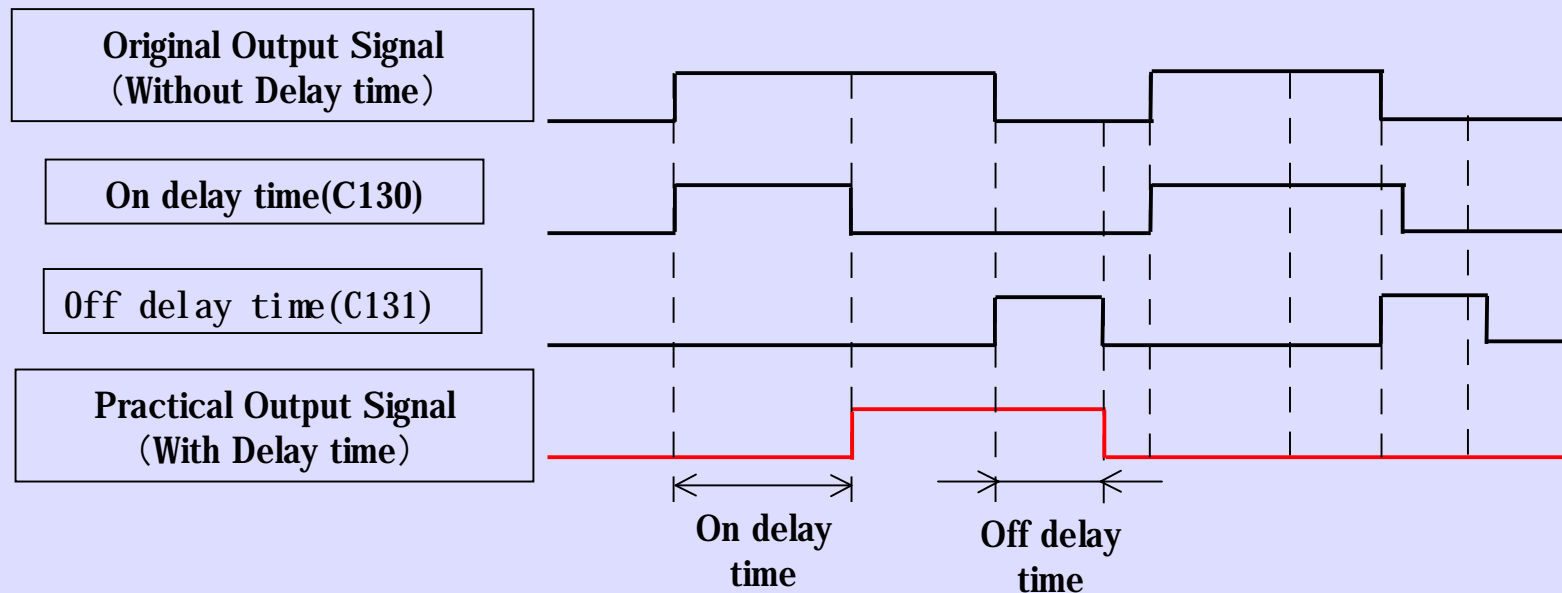


Add2. Analog Frequency Command Hold Function

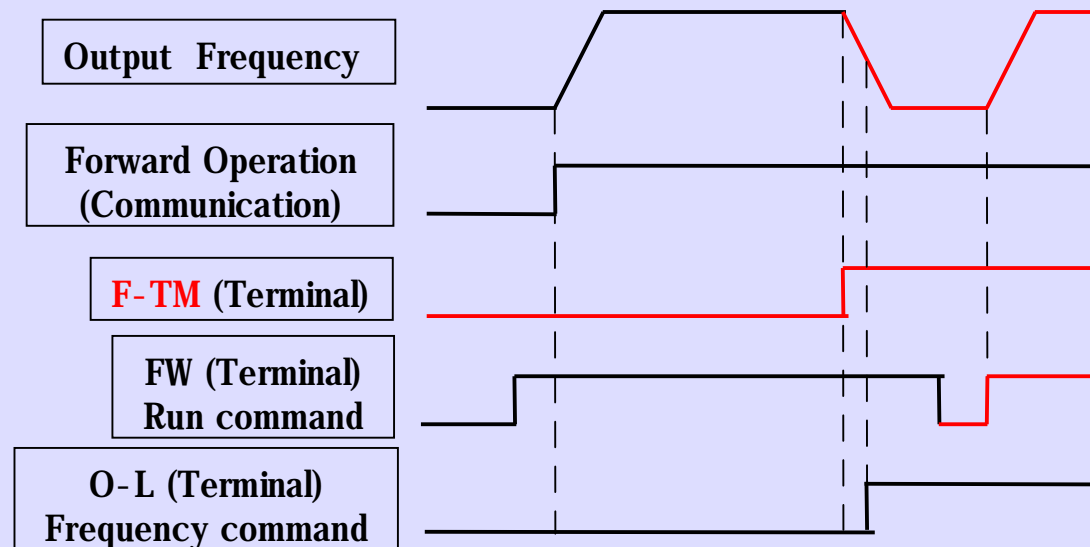


Add3. Intelligent Output Terminal

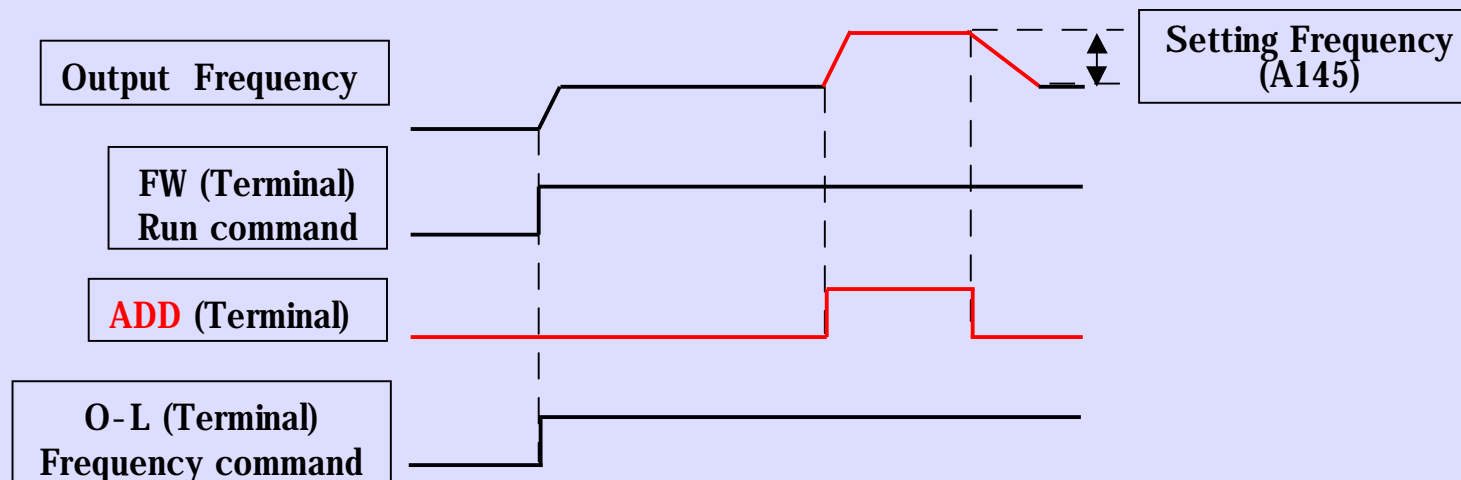
Delay Time Function



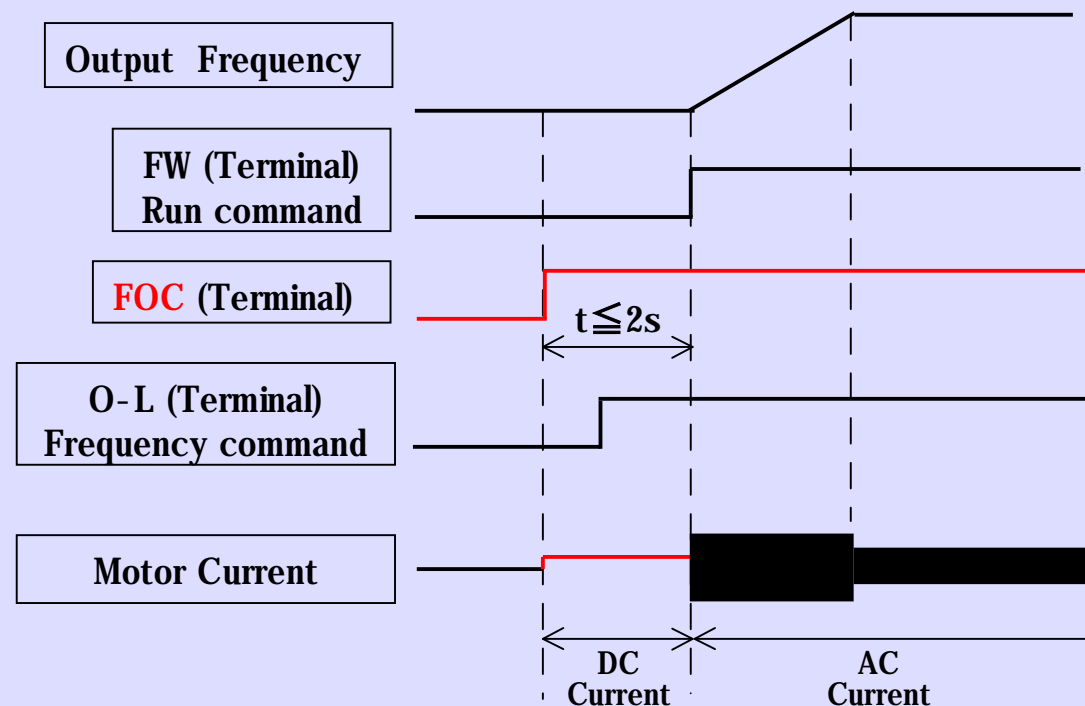
Add4. Intelligent Input Terminal F-TM(Force Terminal) Function



Add5. Frequency Command Additional Frequency Function



Add6. Intelligent Input Terminal Beforehand Field Current Function



Add7. PID Loop Operation

Reverse PID

