

Specifications indicated in this material are based on plan and subject to change.

SJ-P1 - New Feature -

Function Description

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Nobuaki Takahashi

Drive System Div., Development Center,
Business Operation Group
Hitachi Industrial Equipment Systems Co., Ltd.

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Concept



SJ-P1

0.4~90kW(200V)
0.7~132kW(400V)

- **Easy**
 - User friendly
- **High Performance**
 - For most demanding application
- **Versatile**
 - Flexible to solve any demands

●200V class (0.4kW~90kW)

		004L	007L	015L	022L	037L	055L	075L	110L	150L	185L	220L	300L	370L	450L	550L	750L	900L
Max Appl. Motor 4P(kW)	VLD	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
	LD	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110
	ND	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
Rated Output Current (A)	VLD	4.4	8.0	10.4	15.6	22.8	33.0	46.0	60.0	80.0	93.0	124.0	153.0	185.0	229.0	295.0	352.0	430.0
	LD	3.7	6.3	9.4	12.0	19.6	30.0	40.0	56.0	73.0	85.0	113.0	140.0	169.0	210.0	270.0	304.0	390.0
	ND	3.2	5.0	8.0	11.0	17.5	25.0	32.0	46.0	64.0	76.0	95.0	122.0	146.0	182.0	220.0	288.0	370.0

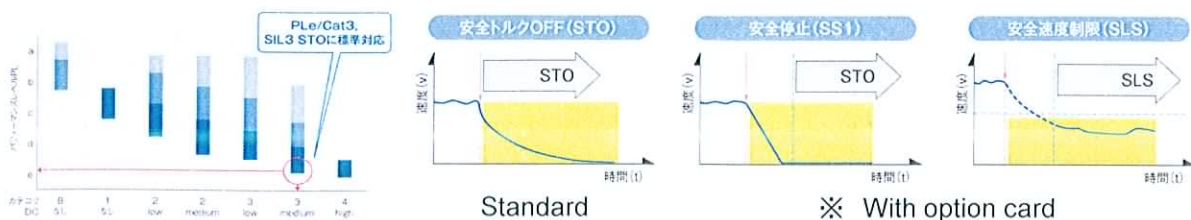
●400V class (0.75kW~132kW)

		007H	015H	022H	037H	055H	075H	110H	150H	185H	220H	300H	370H	450H	550H	750H	900H	1100H	1320H
Max Appl. Motor 4P(kW)	VLD	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160
	LD	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160
	ND	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
Rated Output Current (A)	VLD	4.1	5.4	8.3	12.6	17.5	25.0	31.0	40.0	47.0	62.0	31.0	40.0	47.0	62.0	176.0	213.0	252.0	316.0
	LD	3.1	4.8	6.7	11.1	16.0	22.0	29.0	37.0	43.0	57.0	29.0	37.0	43.0	57.0	160.0	195.0	230.0	290.0
	ND	2.5	4.0	5.5	9.2	14.8	19.0	25.0	32.0	39.0	48.0	25.0	32.0	39.0	48.0	150.0	180.0	217.0	260.0

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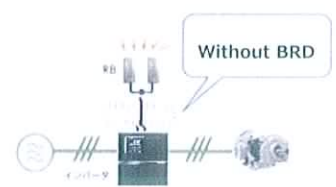
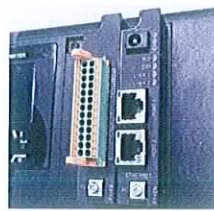
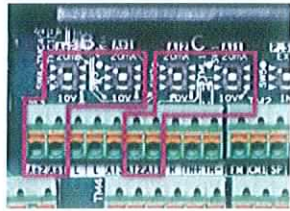
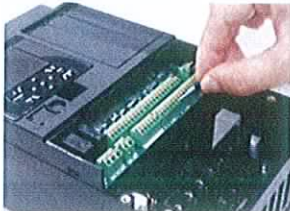
New Feature for SJ-P1

Model	SJ700	SJ-P1
Supply Voltage	400V DC24 [V]	380 - 480 [V] N/A Available ([P24] - [CM1] input)
Rating Over Load Capability	Single (SJ700) Dual Rating (SJ700D3) (Ex. 185kW/200V) VT : 120% 1min (85.0A rated current) CT : 150% 1min (76.0A ")	Triple Rating (Ex. 185kW/200V) VLD:110% 1min (93.0A rated current) LD :120% 1min (85.0A ") ND :150% 1min (76.0A ")
Output frequency	IM-VF IM-SLV PM-SLV	Min. freq. to 400 [Hz](V/f) Min. freq. to 120 [Hz](SLV) N/A 0 - 400 [Hz]
Base frequency setting	30Hz	10Hz
Standard keypad	OPE-S (4-digit 7SEG)	VOP (Full color TFT)
Error history	6	10
Password	N/A	Available (Equivalent WJ200)
Safety	N/A	PLe/Cat3, SIL3 STO (Standard) SS1/SLS (Option Card)



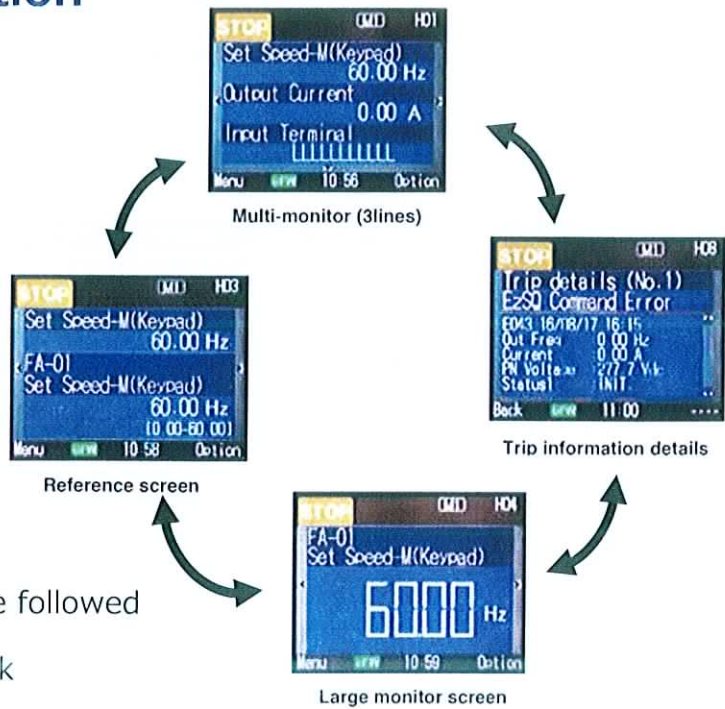
New Feature for SJ-P1

Model	SJ700	SJ-P1
Input terminal	8 port (1 to 8) Screw terminal	11 port (1 to 9 + A/B) Push-in connection [A]/[B] High speed pulse input. (Max.32kHz)
Output terminal	5 + 1c-Relay	5 + 1c-Relay + 1a-Relay
Analog input terminal	O (0 - +10V Voltage input) Oi(0 - 20mA Current input) O2(0 - ±10 V Voltage input)	Ai1 (0 - 10V / 0 - 20mA switched by DIP-SW) Ai2 (0 - 10V / 0 - 20mA switched by DIP-SW) Ai3 (0 - ±10 V Voltage input) *[AT] terminal removed
Analog output terminal	AM (0 - +10V Voltage output) AMI(0 - 20mA Current output) FM (PWM output)	Ao1 (0 - 10V / 0 - 20mA switched by DIP-SW) Ao2 (0 - 10V / 0 - 20mA switched by DIP-SW) Ao3 (PWM output)
USB	N/A	Micro-B connector as standard
RS485 terminal	1 Terminal + Termination Resistor (SPx1 + SNx2 + RPx1)	2 Terminal + Termination Resistor + Signal Ground (SPx2 + SNx2 + RPx1 + SG)
Option Card	2 slot	3 slot
Braking Circuit	~22kW (200V) ~22kW (400V)	~22kW (200V) ~ 55kW (400V) (45kW, 55kW by order)



VOP (Visual Operation Panel)

➤ Large TFT monitor with good visibility for better view and easy operation



- [other functions]
- copy function
 - multi language English & Japanese followed by others
 - Alarm History with Real Time Clock (batteries not included)

Keys

Example of "Operation visualization Icon"

	The motor is in forward running.	LIM	Output frequency is limited by such as overload.
	The motor is in reverse running.	ALT	The inverter is in overload notice or thermal notice.
TRIP	Inverter is in trip status.	NRDY	The inverter can not be operated in the RUN command.
STOP	Operation command is entered, but the inverter is forced stop.	FAN	The inverter is in Fan life notice state.
	The inverter is stopped, because Operation command is OFF or frequency command is 0Hz.	C	The inverter is in Capacitor of Logic board notice state.

Visualization Icon

Status Icon for easy recognition

F1 key

Home, cancel, etc.
Shown in left bottom.

RUN key

▲▼ key SELECT key

Arrow keys for cursor moving or for selecting each screen.
Center button for selection.

Monitor

Parameters and data.
(Three background colors, Blue, red, black are available)

F2 key

Save data, etc.
Shown in right bottom.

STOP key



VOP (Visual Operation Panel)

Screen transition example

SJ700 to SJ-P1

• Display of the SJ700 / L700

E07.2

Error code
Inverter status at trip point

TRIP NRDY

Occurring trip
Under-Voltage

Shows that the inverter is in trip condition.
Shows the cause of trip.

Displays trip event information:
Output frequency at trip point/Motor current at trip point/Motor current at trip point/Cumulative inverter operation/Cumulative power-ON time at trip point

Quick View

Multi-monitor (3lines)

Verify View

Reference screen

Clear View

Large monitor screen

Error View

Trip history screen
Trip information details

Up/down/left/right keys

F1 F1 key

SEL key

Up/down/left/right keys

Either monitoring changes or parameter change is selected by the **SEL** key

F1 F1 key

SEL key

Up/down/left/right keys

Select change parameter

F1 F1 key

SEL key

Up/down/left/right keys

Select the setting value with the arrow keys

Other features!

- Setting data can be saved in the memory of the operation panel! It is safe for data retention even when the inverter fails.
- Operation panel is also copy unit!
- If the battery is used, the real-time data is retained even when the power is cut off of the inverter.
- Operation panel can be extended connected by option cable ICS-1 or ICS-3 (Note: While the power supply Please do not remove the operation panel)

➤ Parameter number: from 4-digits to 5-digits.

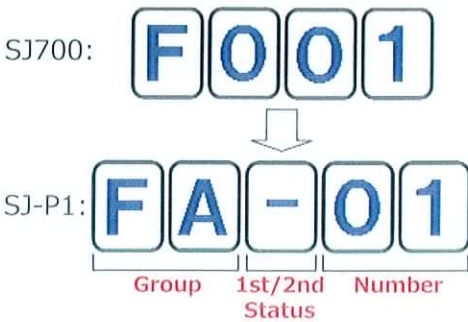
<VOP>



<Group>

Code	Content
dx	Monitor
Fx	Both for parameter setting and monitoring use
Ax	Any "Command" related parameters
bx	Output restriction and protection related parameters
Cx	Input / Output terminals related parameters
Hx	Motor constant and motor control related parameters
Ox	Parameters for Option cards
Px	Parameters of Application (Variation)
Ux	Basic setting related parameters

Ex) Speed setting

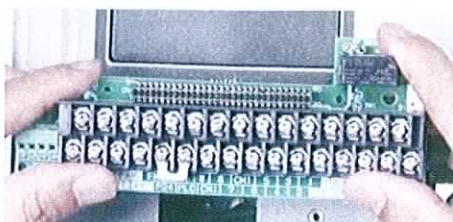
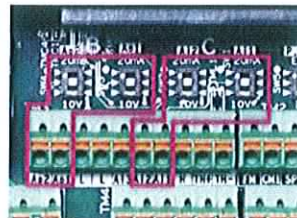
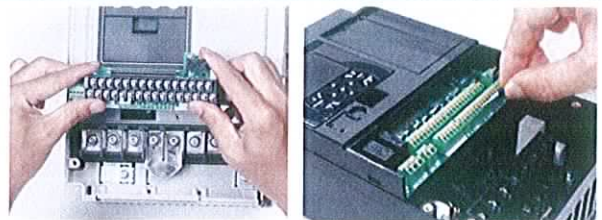


<1st/2nd status>

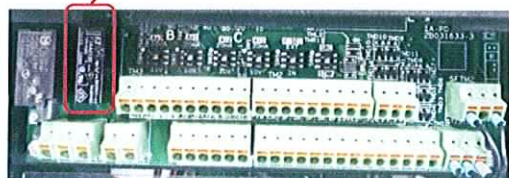
Code	content
-	Common setting for 1 st /2 nd motor
1	1 st motor setting
2	2 nd motor setting

Terminal (Screw to Push-in)

- Input / Output terminals (Push-in terminal)
- Analog signal selection (4-20mA/0-10V by DIP switch)
- Sink/Source signal selection (by DIP switch)



More Relay terminal

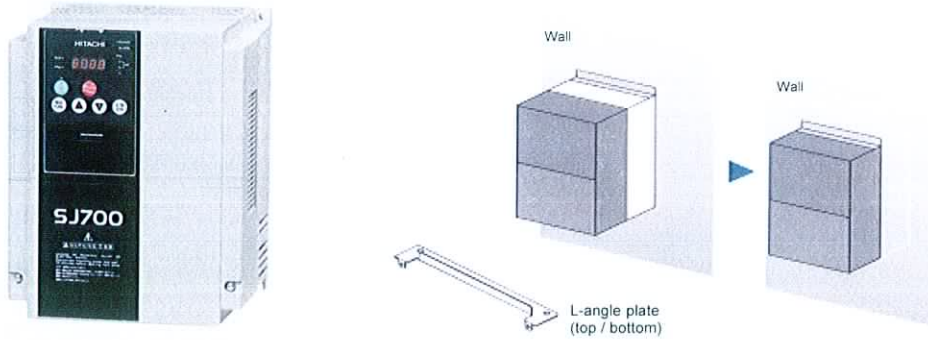


H	O2	AM	FM	TH	FW	8	CM1	5	3	1	14	13	11	AL1
L	O	OI	AMI	P24	PLC	CM1	7	6	4	2	15	CM2	12	AL0 AL2

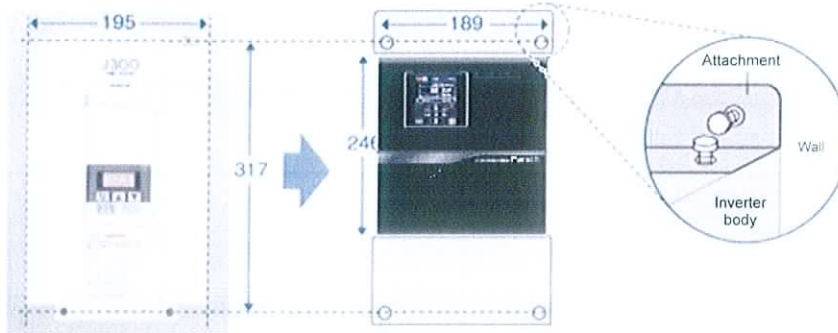


Detachable foot plate (Option to Standard)

➤ External Heat Sink



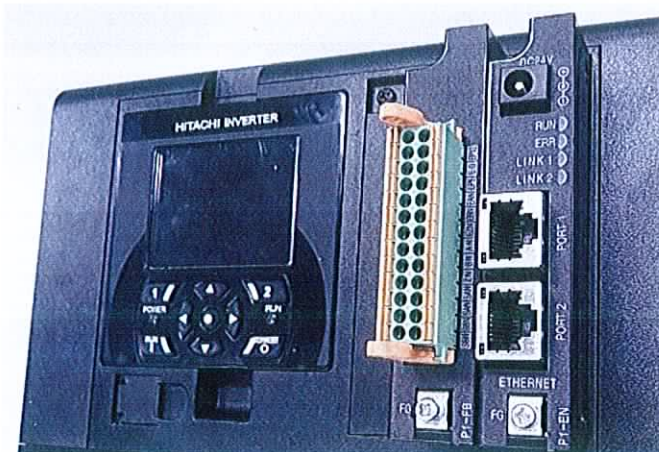
➤ Easily adjustable mounting



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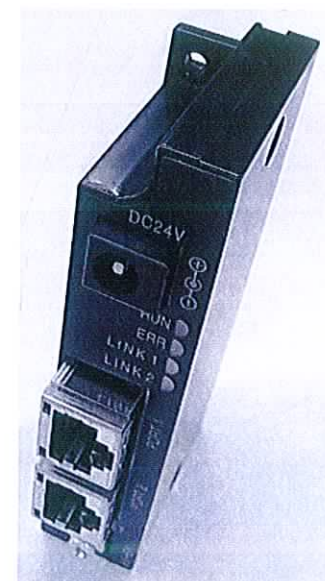
Option Card (Cassette)

➤ Externally Accessible Cassette Option Card



P1-FB and P1-EN in Slot

P1-EN (Ethernet option)⇒



Option Card

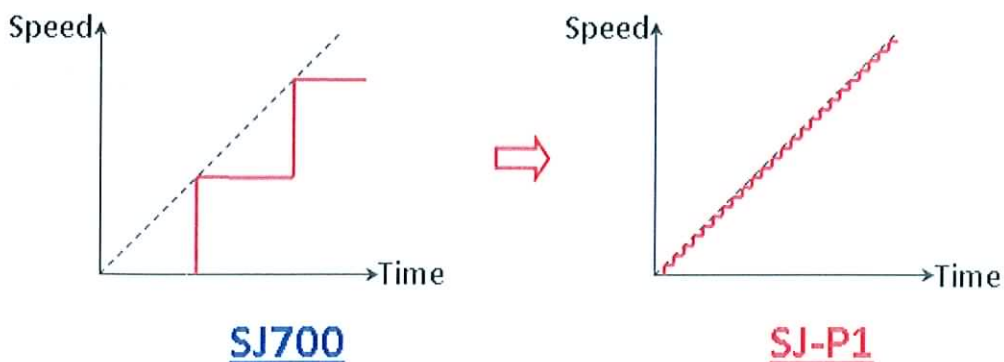
Option card List (Planned)			
Safety Option	P1-FS	Functional safety	SS1, SBC, SLS, SDI, SSM available
I/O Option	P1-RY	Relay output	1a-relay × 5
	P1-AG	Analog I/O	0-10 (V) / 0-20 (mA) Switched by Dip-SW × 2
			0-± 10 (V) voltage input × 1
			0-10 (V) / 0-20 (mA) Switched by Dip-SW × 2
	P1-DG	Binary input	16bit Binary input
P1-RTD	Temperature detect	Pt100 input × 3	
Speed feedback Option	P1-FB	Encoder feedback	-Line driver input (SJ-FB) -Power supply for Encoder:5V or 12V -input signal :EA/EB/EZ (Speed) :SA/SB (position) -output signal: A/B/Z
			P1-FBT
	P1-RLV	Resolver	Resolver (7VAC 10kHz)
Communication Option	P1-ECT	EtherCAT	
	P1-PB	PROFIBUS-DP	
	P1-PN	PROFINET	
	P1-EN	EtherNet	Modbus/TCP

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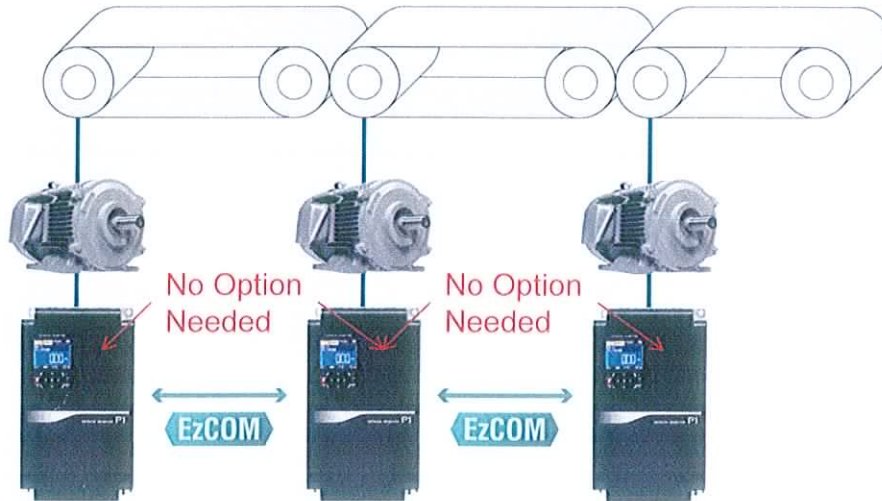
Improved Controller Speed

➤ Controller speed

- Smooth operation
- Fast response
- Instantaneous acceleration changes.

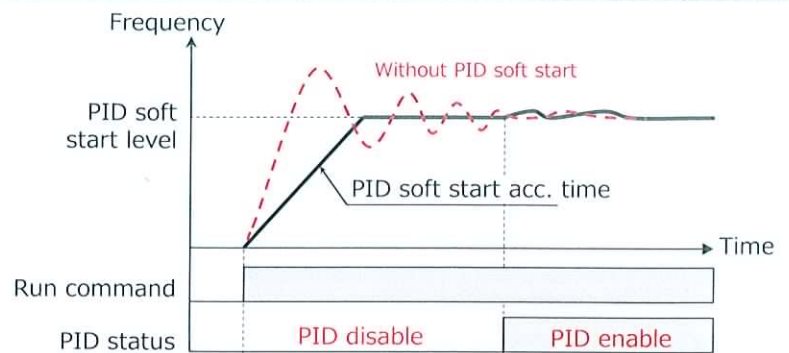


- **Improved RS485 speed (115kbps)**
 - Quick response on Modbus communication
 - Profitable for EzCom

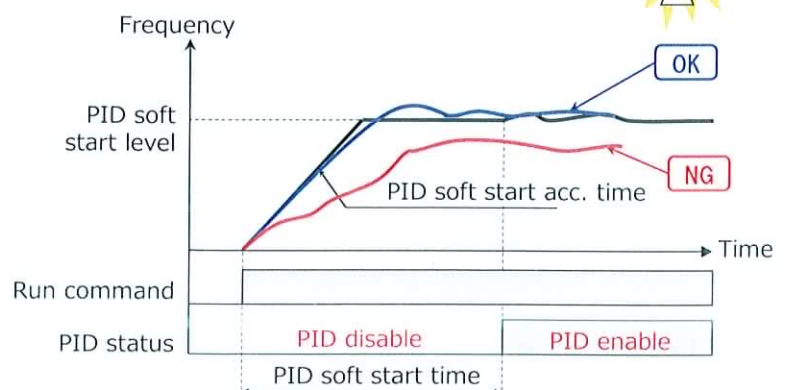


Improved PID controller

- **PID soft start**
 - Reduce water hammer effect while using PID loop



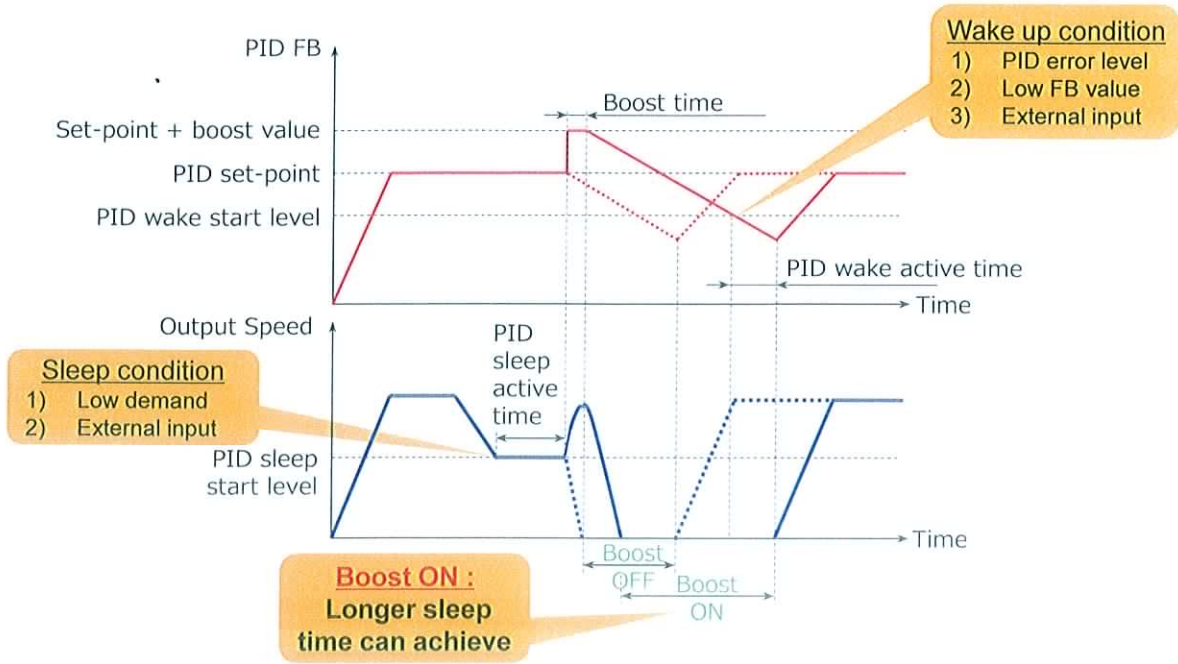
- **PID soft start abnormal detection**
 - Detect when PID error is above the preset value.
 - Warning / Trip can be selected



Improved PID controller

➤ PID Sleep Mode

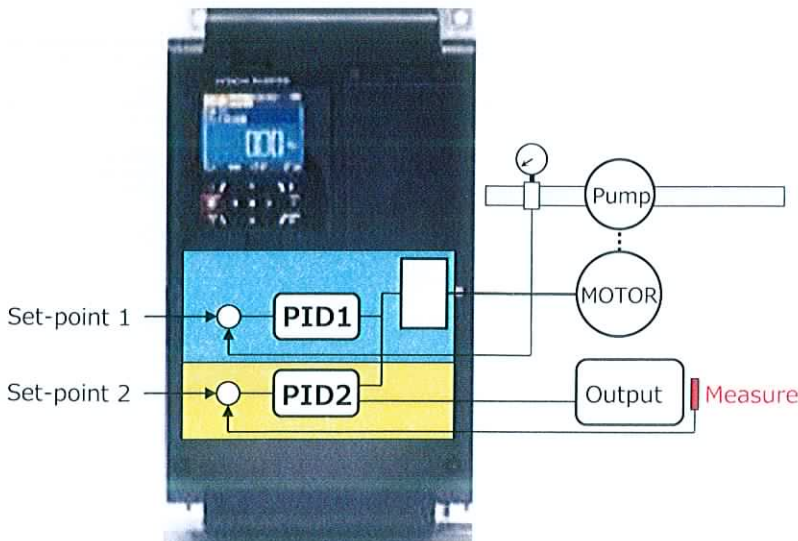
- Optimize energy saving



Improved PID controller

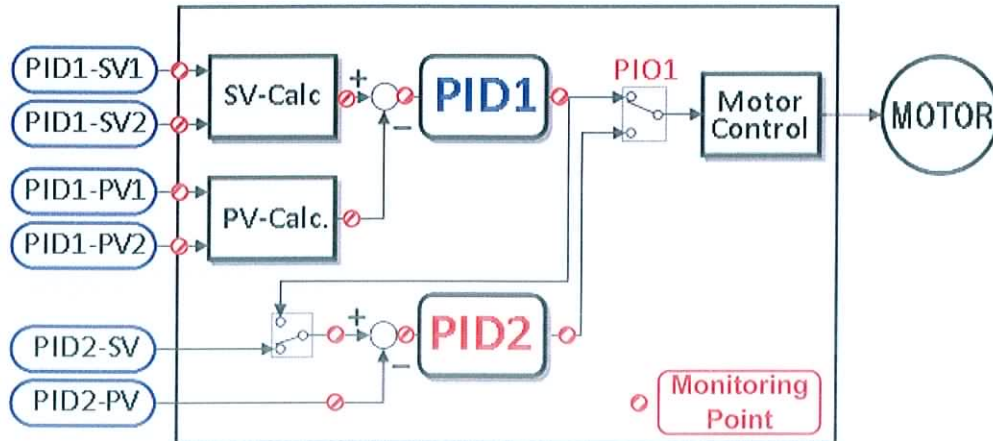
➤ Multiple PID loop (Optimized for process control)

- Independent PID loop
- Selectable PID
- PID output for 4-20mA/0-10V



➤ Monitor value (Both VOP, Analog Output)

- Set-point
- Deviation
- PID output



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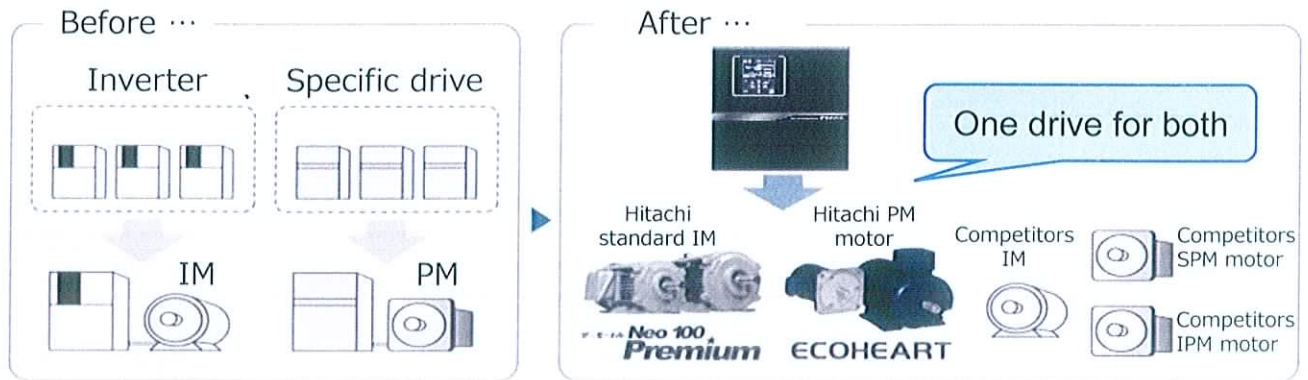
Improved PID controller

➤ Unit conversion for PID monitor data

PID Unit Conversion						
00 (Non)	09 (kHz)	18 (° C)	27 (ft/s)	36 (m³/s)	45 (gal/min)	54 (bar)
01 (%)	10 (ohm)	19 (kWh)	28 (ft/min)	37 (m³/min)	46 (gal/h)	55 (Pa)
02 (A)	11 (mA)	20 (mF)	29 (ft/h)	38 (m³/h)	47 (ft³/s)	56 (kPa)
03 (Hz)	12 (ms)	21 (mVs/rad)	30 (m)	39 (kg/s)	48 (ft³/min)	57 (PSI)
04 (V)	13 (P)	22 (Nm)	31 (cm)	40 (kg/min)	49 (ft³/h)	58 (mm)
05 (kW)	14 (kgm²)	23 (min ⁻¹)	32 (° F)	41 (kg/h)	50 (lb/s)	
06 (W)	15 (pls)	24 (m/s)	33 (l/s)	42 (t/min)	51 (lb/min)	
07 (hr)	16 (mH)	25 (m/min)	34 (l/min)	43 (t/h)	52 (lb/h)	
08 (s)	17 (Vdc)	26 (m/h)	35 (l/h)	44 (gal/s)	53 (mbar)	

➤ Save energy and cost by using any motors

- One drive for both IM/PM motor



PM motor is appreciated in 24/7 application

➤ Adjustable Over-Current level by software

- OC trip level can be adjusted by parameter setting

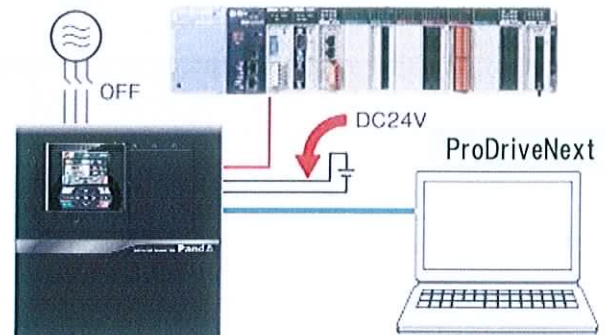
Applicable for PM motor with lower demagnetizing current

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Versatile

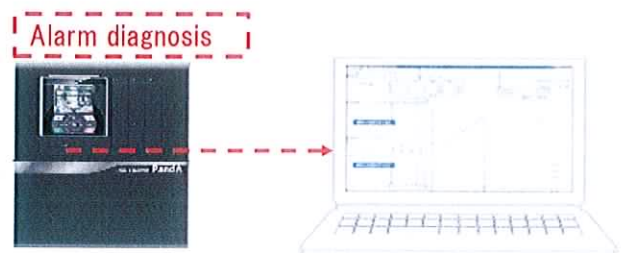
➤ 24V control power supply

- In addition to R0-T0, 24VDC input is available for configuration



➤ Embedded data trace function (ProDriveNext)

- Store continuously the drive data into own memory
- Post-analysis can be done by using trace data



➤ **Programming Function [EzSQ]**

➤ To make custom application with BASIC like language.

Line	ラベル	コマンド	パラメータ1	パラメータ2	パラメータ3	パラメータ4	パラメータ5
7		case	1				
8		call	RUN_FW				
9		case	2				
10		call	RUN_RV				
11		case	3				
12		call	WAIT_RUN				
13		case else					
14		call	STOP				
15		end select					
16		goto	LOOP				
17							
18		sub	STOP				
19		UBW=	Xw	and	3		
20		if	UBW	<	2	then	LBLO
21		FW=	1				
22		timer set	TD(0)	U(00)			
23		U(31)=			1		
24	LBLO	end sub					
25							

It makes:

- Unique drive solution
- Cost savings
- Added value for standard inverter .



Unique drive solution for the customer

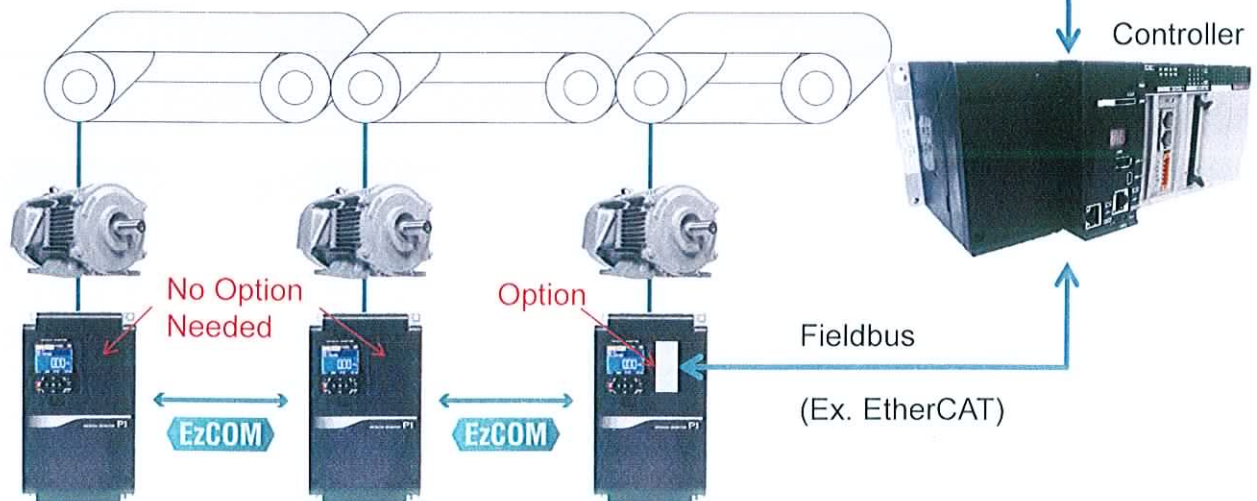
EzCOM and Fieldbus

➤ **Peer to Peer network [EzCOM]**

➤ Without PLC or PC

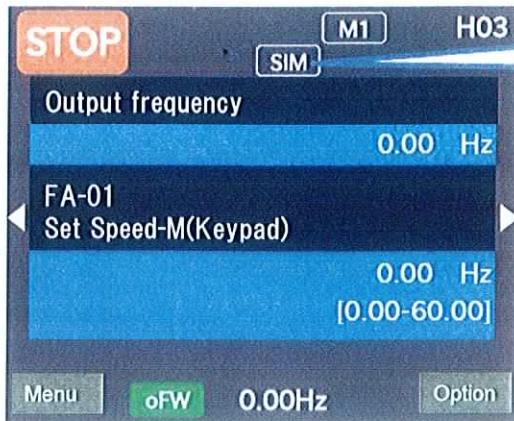
➤ **Option card for field network**

➤ Connect to upper link

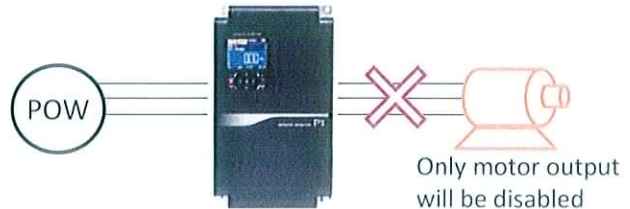


➤ Simulation mode (New Feature)

- It simulates the drive function without motor output.



"SIM" will be shown during simulation mode.



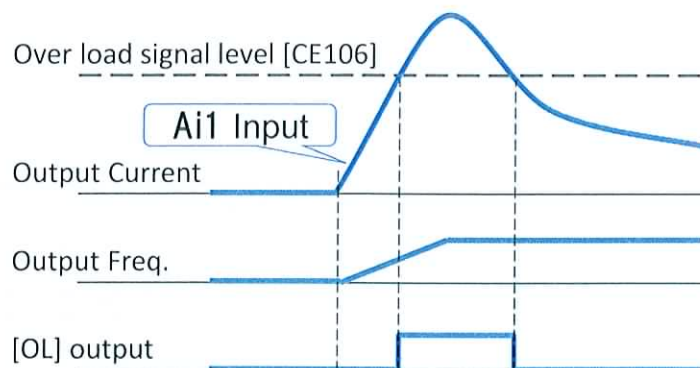
➤ Advantage

- Even analog input can be assigned to specific internal data.
- Permit to pre-evaluate the required functionality.

Simulation Mode

➤ Example

- Checking Over-Load output level.

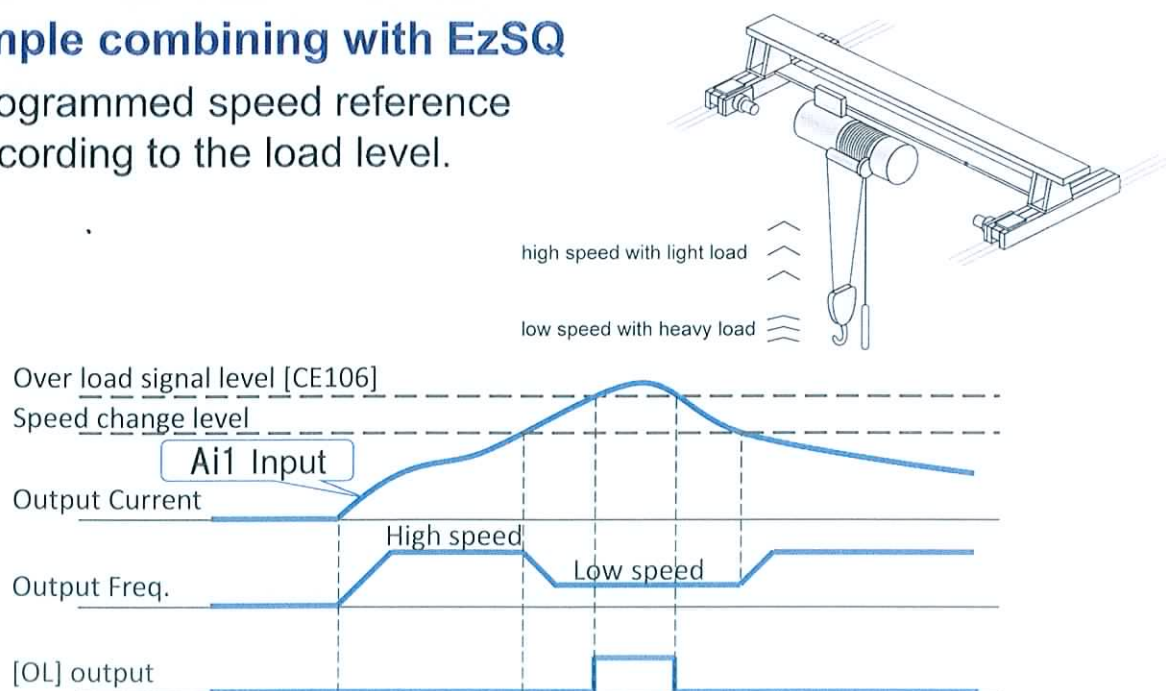


➤ Procedure

- Set [CE106] then RUN.
- Set [PA-22] = 02 (Ai1)
- Change analogue input value (Ai1).
- When exceed [CE106], will activate output digital signal [OL]

➤ Example combining with EzSQ

- Programmed speed reference according to the load level.



Debug process for EzSQ will be easy

Parameter Setting related to Simulation Mode

Item	Parameter	Data	Description
Simulation Mode Enable	[PA-20]	00	Disable
		01	Enable
Error Code Selection For Alarm Test	[PA-21]	0-255	"Artificial trigger"
Selection for Not only current but.....		00	Disable
		01	(by Keypad)
		02	(by Terminal[Ai1])
		03	(by Terminal[Ai2])
		04	(by Terminal[Ai3])
Output Current Monitor Value	[PA-22]	0-300%	Also with parameter setting Internally, settings are treated as output
PN Voltage Monitor Value	[PA-24]	0-450V	
Output Voltage Monitor Value	[PA-26]	0-900V	
Output Torque Monitor Value	[PA-28]	-500-+500	