



7300PA Inverter

(Variable Torque Inverter with Energy Saving Control)

220V Class: 5HP ~ 125HP

440V Class: 5HP ~ 500HP

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By Y.F.Feng

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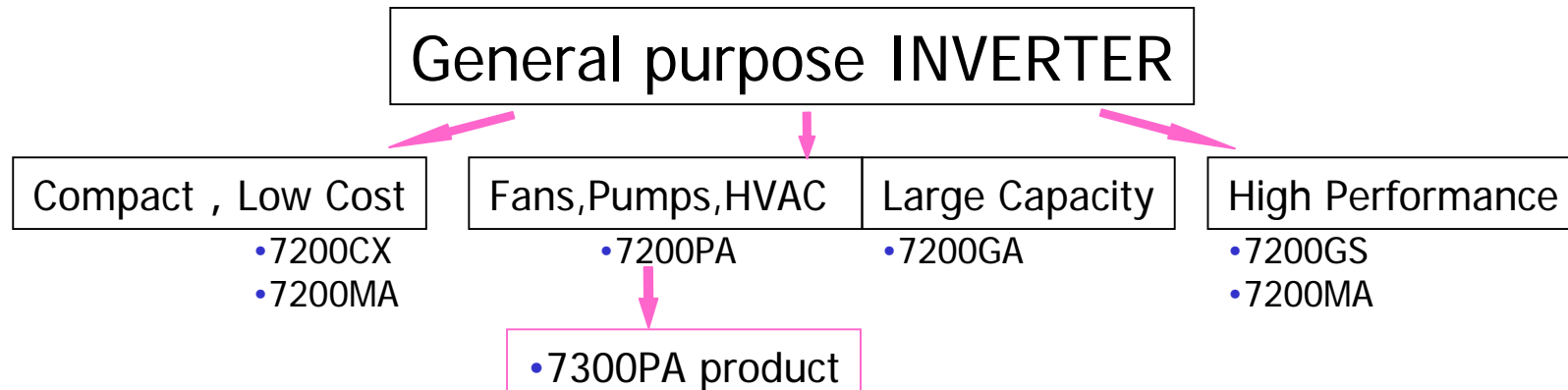
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1. Overview of 7300PA Series

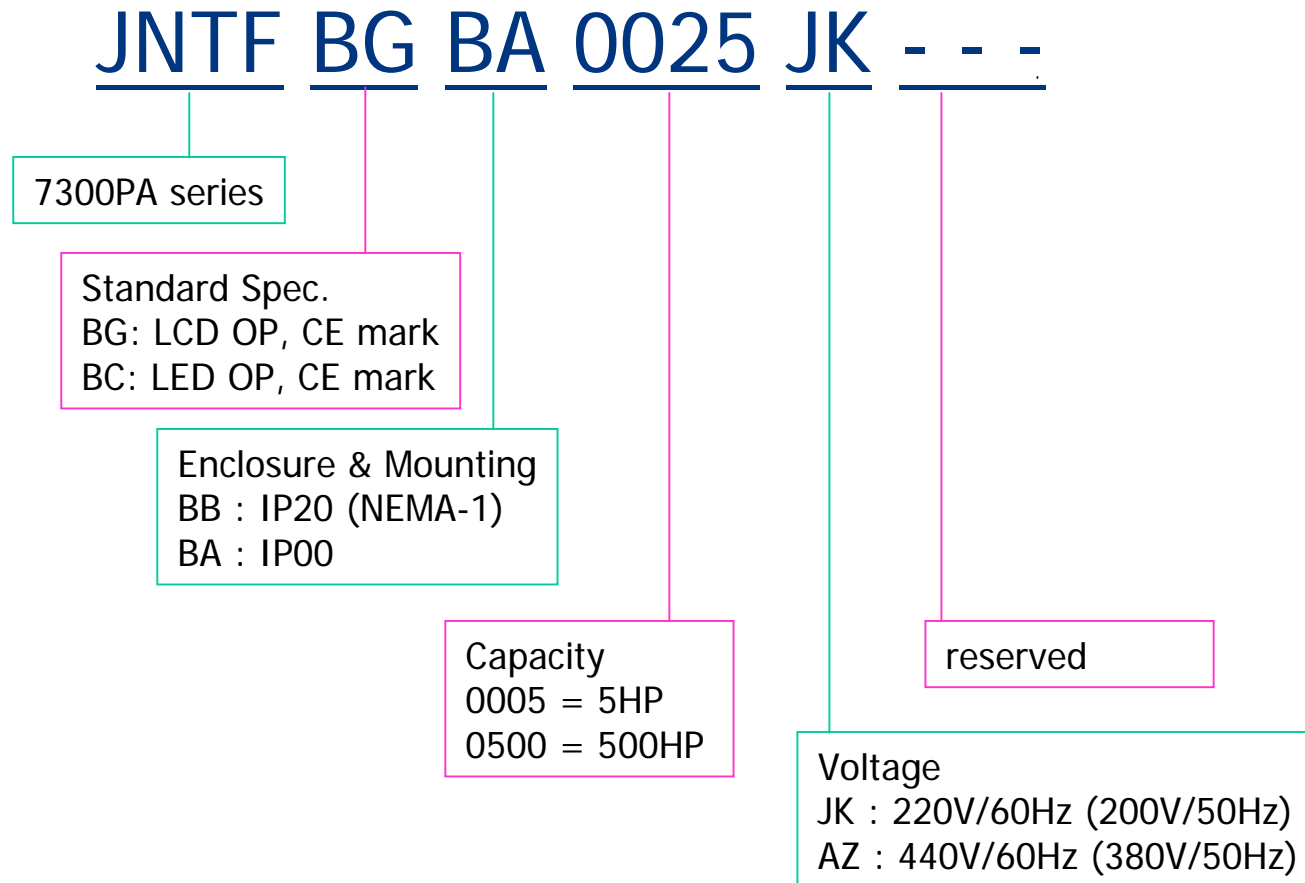


- Cost Leader
- More Functions: Include all 7200PA's features and add:
 1. PID & Auto Energy Saving function.
 2. Input Phase Loss & Output Phase Loss Protection.
 3. LCD operator(Chinese & English Language) , used as Copy Unit (Big size LED operator optional)
 4. 110% , 1 min Overload capability.
 5. Output zero phase filter built-in.
 6. PF , KW, KWHr , Motor Elapsed Run Hour.
 7. Multi-Function Input/output interface.
 8. RS-485 communication –

| | |
|------------------------|-------------------------|
| MODBUS(PA-M) | METASYS N2(In plan) |
| PROFIBUS(PA-P) | DEVICNET(PA-D)(In plan) |
| 1-8 PID card (PA-PID). | |
 9. PID Sleep/Wake-up Functions.
 10. Cooling Fan on/off control
 11. Can Monitor displayed under PRGM mode (Hn- constants)
- Easy operation
- Completed Function : 220V 3Ø 5HP ~ 125 HP
440V 3Ø 5HP ~ 500 HP
- Globalization: CE, UL

2. 7300PA Inverter

a> Inverter MODEL



b> SPECS

Performance Features

- Ratings: 5HP to 125HP at 230VAC, 3Ph
5HP to 500HP at 460VAC, 3Ph
- Overload Capacity: 110% Rated Output Current for 1 minute
- Control method: Sine wave PWM
- Frequency Control Range: 0.1~180.0Hz
- Ramp or coast to stop, adjustable current limited
- Adjustable acceleration and deceleration : 0.1sec ~ 6000.0sec
(2setting each, accel/decel time setting independently)
- Soft Start, Soft Stop (S curve)
- Critical frequency rejection: 3 selectable, adjustable bands
- Drive efficiency: 96 to 98%
- Auto Energy Saving Control: improves motor efficiency
- Displacement power factor: 0.98 through speed range
- Reference command loss detection
- Selectable auto restart number and time interval
- Local/Remote control function key
- Power loss ride-thru: 2sec
- DC Bus reactor: 30HP to 125HP (230VAV)
40HP to 300HP(for 460VAC)

Protective Features

- Current limited stall prevention during accel, decel, and run
- Over current protection (OC): 200% rated output current
- Short circuit protection (SC)
- Ground fault protection (GF): approx 50% of the inverter rated current
- Motor overload protection (OL1): Electronic thermal overload relay
- Inverter overload protection (OL2): Electronic thermal overload relay
(110% inverter rated current 1 minute)
- Over torque detection (OL3): Selectable over torque detection level
- Over Voltage protection (OV): 410VDC (for 230VAC class)
820VDC (for 460VAC class)
- Under Voltage protection (UV): 190VDC (for 230VAC class)
380VDC (for 460VAC class)
- Phase loss protection: Input phase loss and output phase loss protection
- Synchronized start into rotating motor via speed search

Design Features

- LCD display (LED display: optional) :Chinese & English
- Programmable digital output: contact x 3, photo coupler x 1
- Programmable digital input: 4
- Frequency setting signal: 0~10VDC(20Kohm), 4~20mA(250 ohm)
- Multi-function analog input: 0~10VDC (20K ohm)
- Multi-function analog output: 0~10VDC x 2
- Elapsed time, Elapsed Energy KWHr, power, power factor monitor
- RS-232 communication port
- Volt/Hertz ratio: Programmable custom V/Hz pattern
- Multi-speed setting: 8 available
- PTC thermistor input
- PID Sleep/Wake-up

Environmental & Service conditions

- Ambient service temperature: -10 to +40 (for NEMA1 type)
- Humidity: 0 to 95% Relative Humidity, non-condensing
- Altitude: to 3300 feet (1000m)
- Input Voltage: -15%/+10%, 200 to 230VAC, 380 to 460VAC
- Enclosure: IP00 and IP20 (NEMA1)

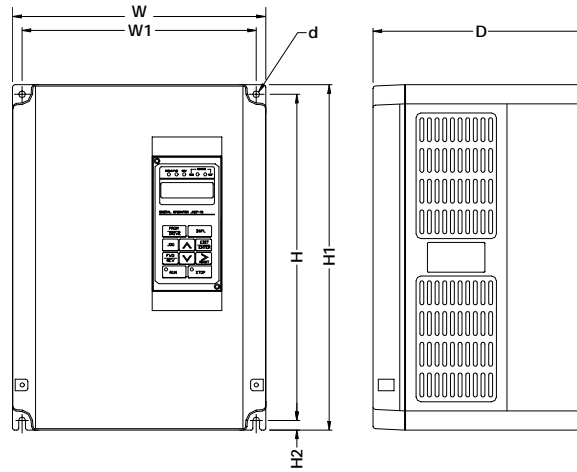
Options available

- Input Fuses
- Line Reactor
- RFI Filter
- Braking Resistor and Braking Unit
- Analog Remote operator station & digital operator extension cable
- Interface options: RS-485 communication card
(MODBUS:PA-M, PROFIBUS:PA-P)
1 to 8 PID Relay card (PA-PID)

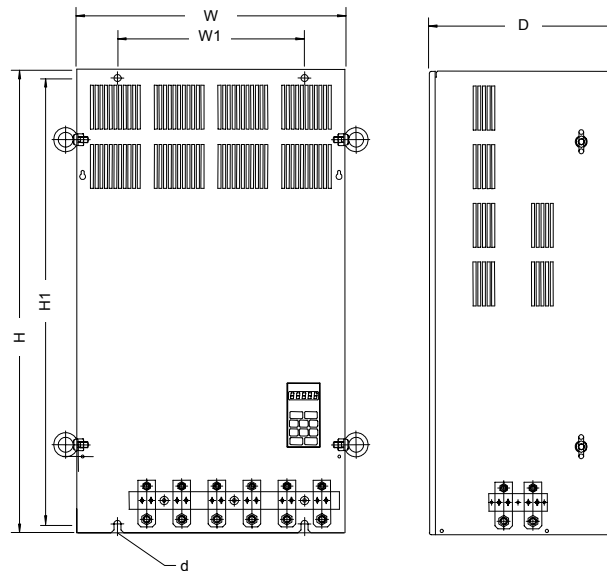
C> Dimensions

| Voltage (V) | Inverter Capacity (HP) | Open Chassis Type (IP00)mm | | | | | | | Weight (Kg) | Enclosed Type (NEMA1)mm | | | | | | Weight (Kg) | ACL/DCL | Reference Figure |
|-------------|------------------------|----------------------------|------|-------|-----|-----|-----|-----|-------------|-------------------------|-------|-----|-----|-----|-------------------------|-------------------------|---------|------------------|
| | | W | H | D | W1 | H1 | d | W | | H | D | W1 | H1 | d | | | | |
| 220V | 5 | 211.2 | 300 | 215 | 192 | 286 | M6 | 5.7 | 211.2 | 300 | 215 | 192 | 286 | M6 | 5.7 | External ACL (optional) | (a) | |
| | 7.5 | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | |
| | 15 | 265 | 360 | 225 | 245 | 340 | M6 | 12 | 265 | 360 | 225 | 245 | 340 | M6 | 12 | External ACL (optional) | (a) | |
| | 20 | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | |
| | 30 | 283.5 | 525 | 307 | 220 | 505 | M8 | 36 | 291.5 | 615 | 307 | 220 | 505 | M8 | 38 | DCL Built-in (Standard) | (b) | |
| | 40 | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | |
| | 60 | 344 | 630 | 324.5 | 250 | 610 | M8 | 47 | 352 | 945 | 324.5 | 250 | 610 | M8 | 50 | DCL Built-in (Standard) | | |
| | 75 | | | | | | | | | | | | | | | | | |
| | 100 | 459 | 790 | 324.6 | 320 | 760 | M10 | 82 | 462 | 988 | 324.6 | 250 | 760 | M10 | 87 | DCL Built-in (Standard) | | |
| 125 | | | | | | | | | | | | | | | | | | |
| 440V | 5 | 211.2 | 300 | 215 | 192 | 286 | M6 | 5.7 | 211.2 | 300 | 215 | 192 | 286 | M6 | 5.7 | External ACL (optional) | (a) | |
| | 7.5 | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | |
| | 15 | 265 | 360 | 225 | 245 | 340 | M6 | 12 | 265 | 360 | 225 | 245 | 340 | M6 | 12 | External ACL (optional) | (a) | |
| | 20 | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | |
| | 30 | 283.5 | 525 | 307 | 220 | 505 | M8 | 36 | 291.5 | 615 | 307 | 220 | 505 | M8 | 38 | DCL Built-in (Standard) | (b) | |
| | 40 | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | |
| | 60 | 344 | 630 | 324.5 | 250 | 610 | M8 | 47 | 352 | 720 | 324.5 | 250 | 610 | M8 | 50 | DCL Built-in (Standard) | | |
| | 75 | | | | | | | | | | | | | | | | | |
| | 100 | 459 | 790 | 324.6 | 320 | 760 | M10 | 80 | 462 | 988 | 324.6 | 320 | 760 | M10 | 85 | DCL Built-in (Standard) | | |
| | 125 | | | | | | | | | | | | | | | | | |
| | 150 | 599 | 1000 | 381.6 | 460 | 960 | M12 | 128 | 602 | 1198 | 381.6 | 460 | 960 | M12 | 135 | DCL Built-in (Standard) | | |
| | 175 | | | | | | | | | | | | | | | | | |
| | 215 | 730 | 1230 | 382 | 690 | 930 | M12 | 132 | 730 | 1330 | 382 | 690 | 930 | M12 | 166 | External ACL (optional) | (c) | |
| | 250 | | | | | | | | | | | | | | | | | |
| | 300 | 730 | 1230 | 382 | 690 | 930 | M12 | 160 | 730 | 1330 | 382 | 690 | 930 | M12 | 176 | External ACL (optional) | (c) | |
| 350 | | | | | | | | | | | | | | | | | | |
| 400 | | | | | | | | | | | | | | | | | | |
| 500 | 730 | 1230 | 382 | 690 | 930 | M12 | 190 | 730 | 1330 | 382 | 690 | 930 | M12 | 196 | External ACL (optional) | (c) | | |
| 500 | | | | | | | | | | | | | | | | | | |

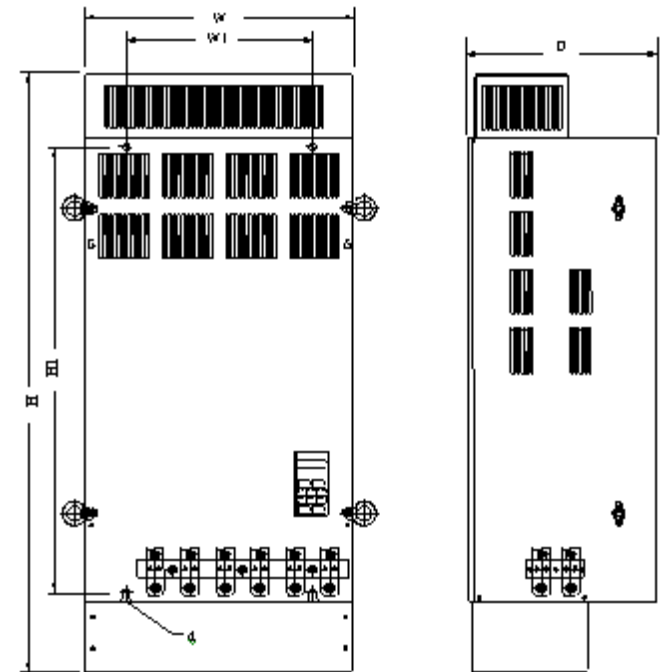
(a) 230V : 25HP
 460V : 25HP, 30HP



(b) 230V : 30HP 125HP
 460V : 40HP 300HP

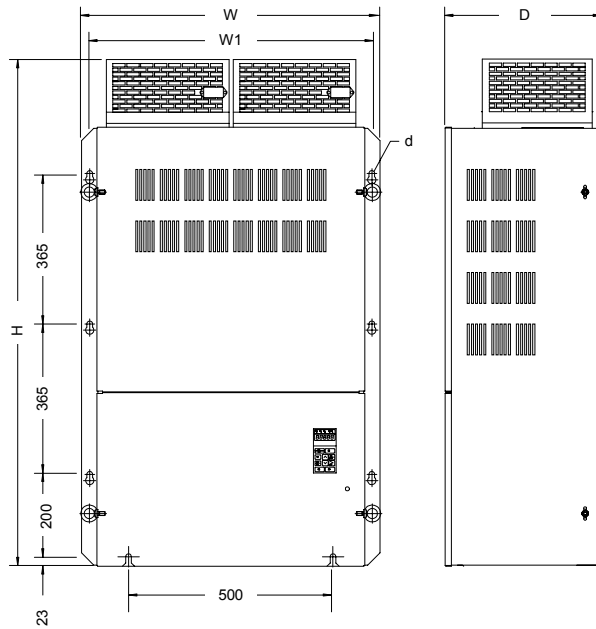


(Open Chassis Type - IP00)

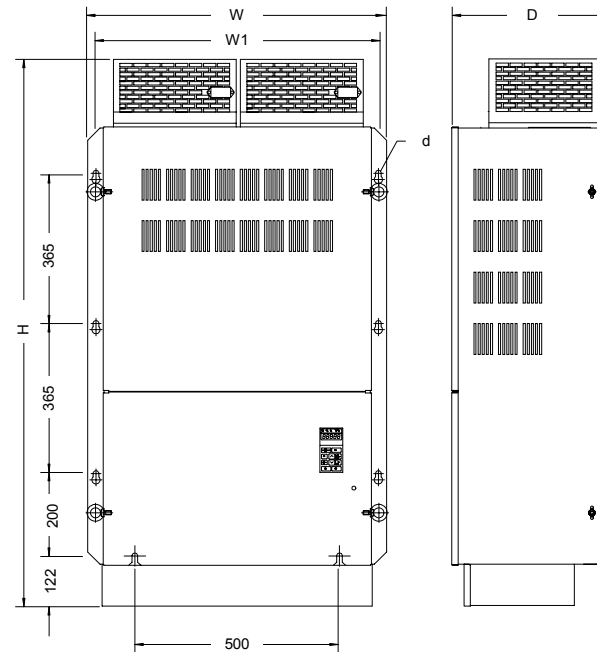


(Wall-mounted Type - NEMA1)

(c) 440V : 350HP, 400HP, 500HP

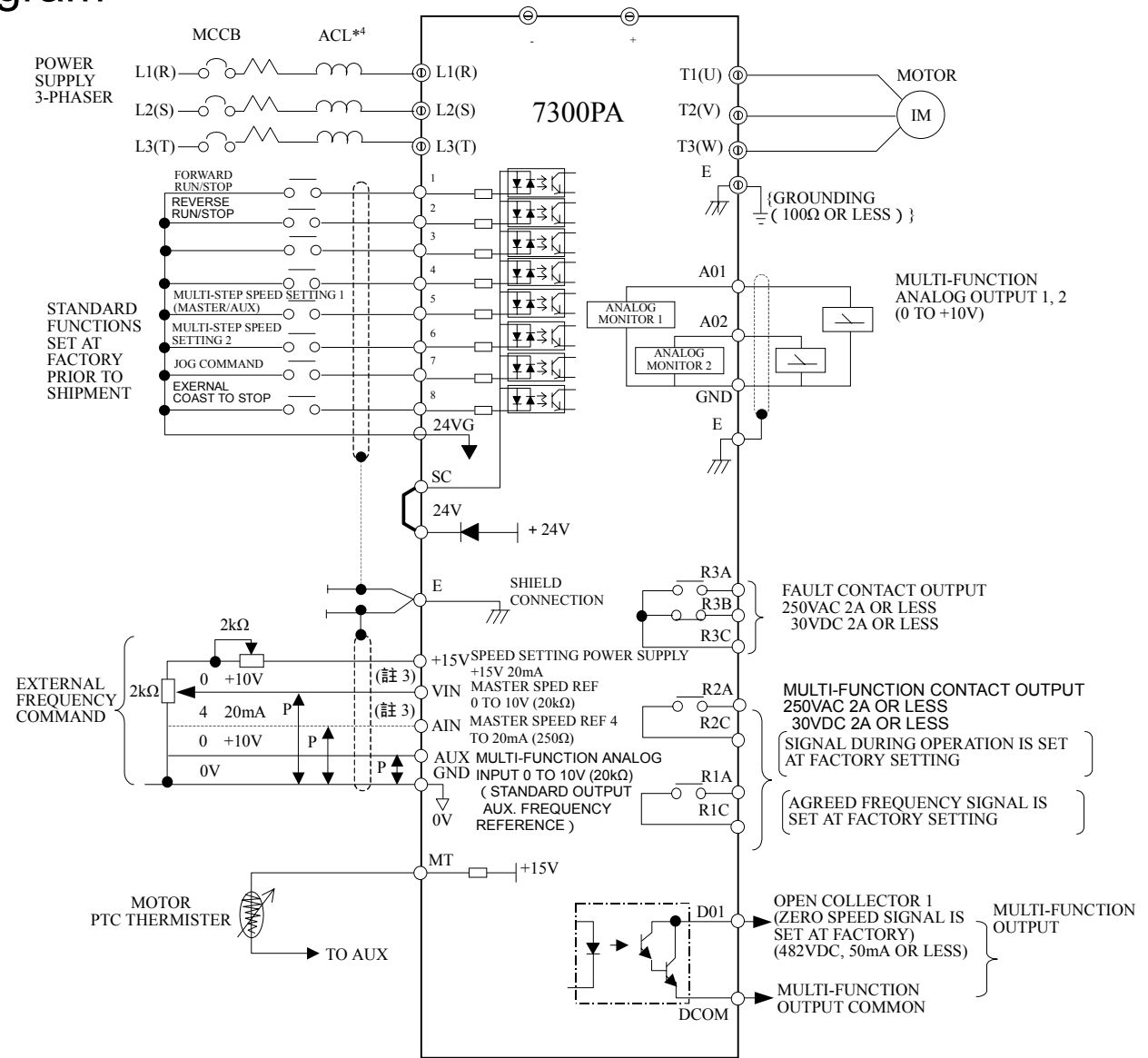


(Open Chassis Type - IP00)

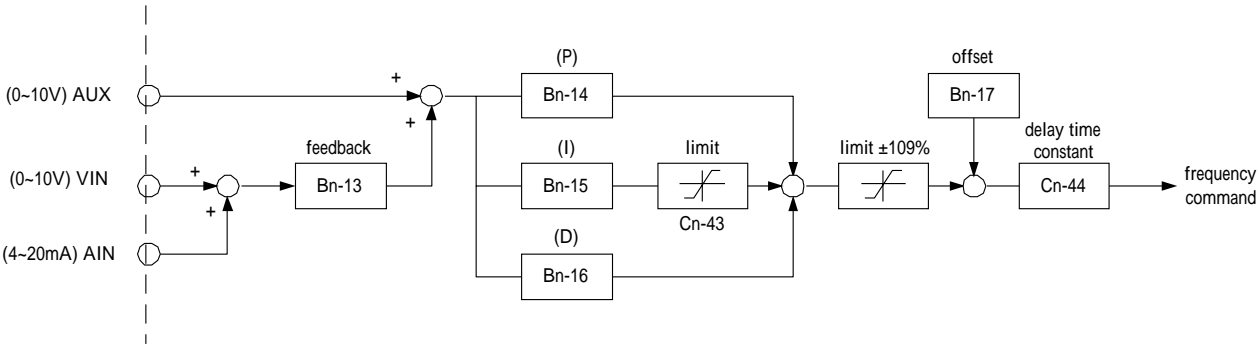
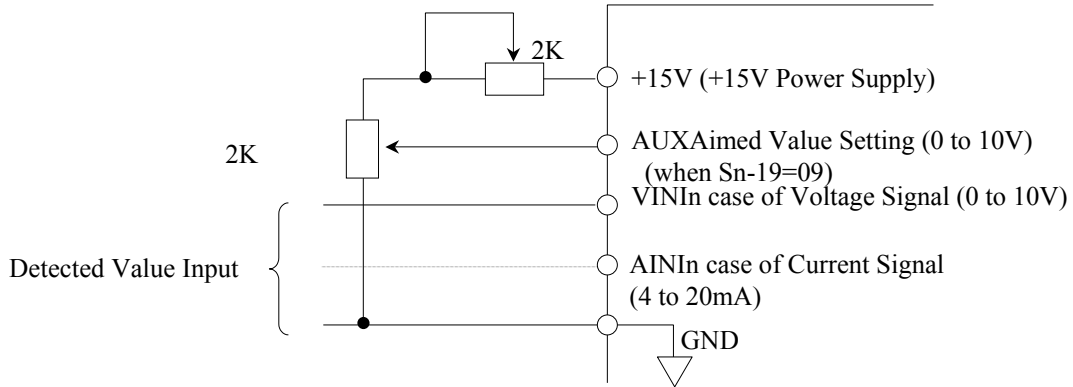


(Wall-mounted Type - NEMA1)

Connection Diagram

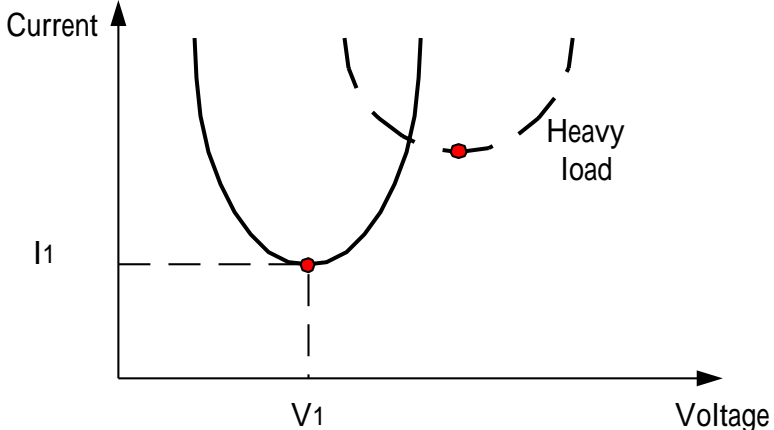
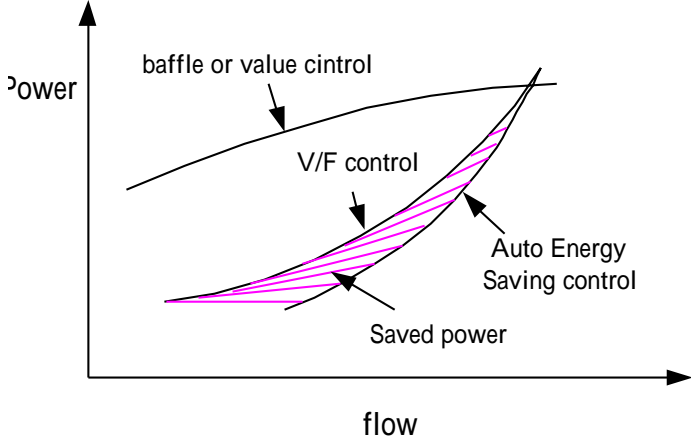


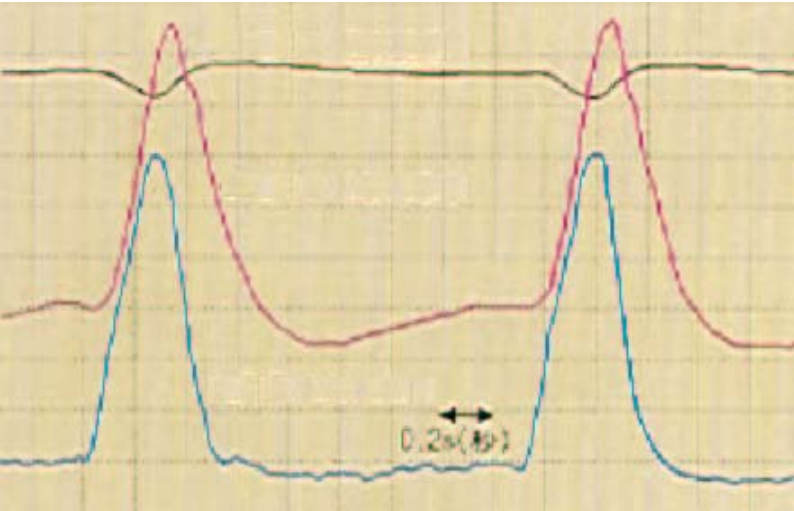
Sales point

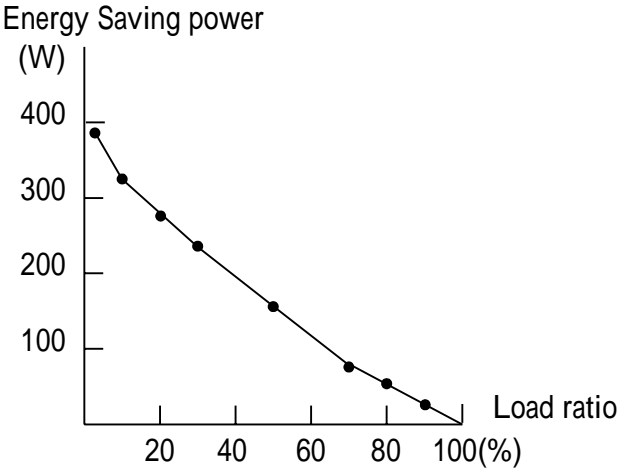
| NO | features | descriptions |
|----|--------------|--|
| 1 | PID function | <p>■ PID control block diagram and operation are the same as 7200MA (and 7200PA)</p>  <p>• Sn-19=09 : PID Control performed AUX terminal = Aiming Value setting of PID control VIN (or AIN) = Feedback value of PID control</p> <p style="text-align: right;">7300PA</p>  <p>Detected Value Input</p> |

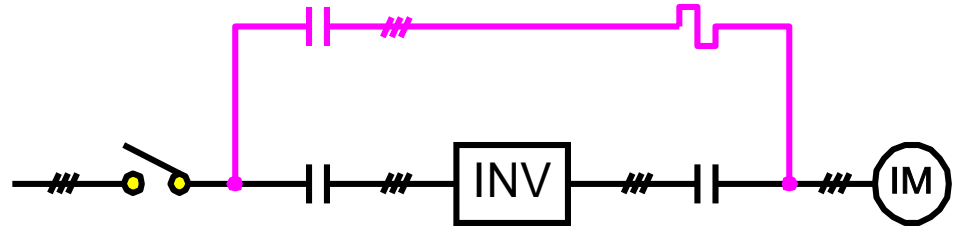
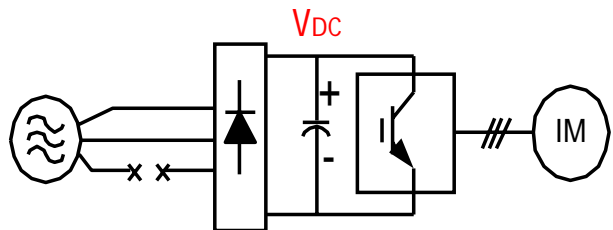
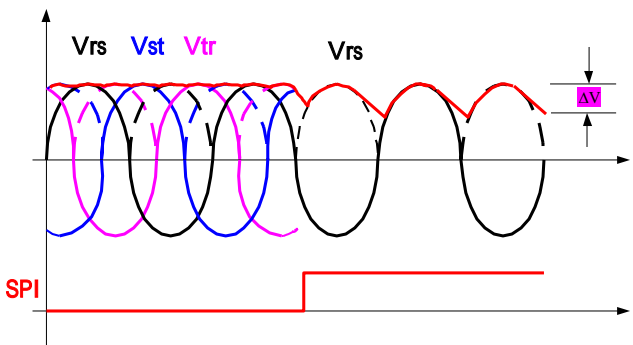
| NO | features | descriptions |
|----|------------|---|
| 1 | (Continue) | <p>■ Monitoring of PID Control status by Digital Operator</p> <ul style="list-style-type: none"> • Terminal AUX (Aimed value) : Un-20 (at DRIVE mode) Hn-11 (at PRGM mode) • Terminal VIN (Feedback value) : Un-18 (at DRIVE mode) Hn-09 (at PRGM mode) • Terminal AIN (Feedback value) : Un-19 (at DRIVE mode) Hn-10 (at PRGM mode) • PID Feedback value after display unit conversion: Un-21 • LCD OP display the PID feedback value after turning on power supply: Bn-10=4 <p>■ Display unit conversion of PID feedback:</p> <p>Bn-21: PID feedback value display Bias Bn-22: PID feedback value display Gain</p> <p> <ul style="list-style-type: none"> • PID detected value after being converted by Bn-21,Bn-22. • Operator display after Power ON(Bn-10=4). </p> |

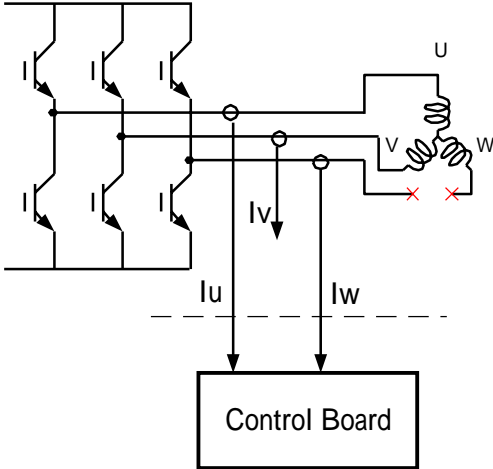
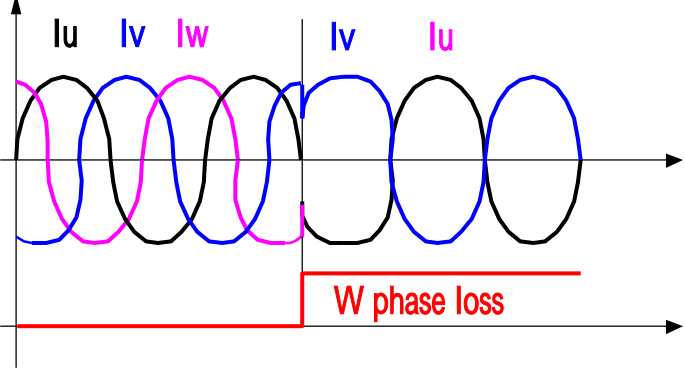
| NO | features | descriptions |
|----|------------|---|
| 1 | (Continue) | <p>■ Monitoring of PID control status by Multi-Function Analog output A01 & A02</p> <p>The multi-Function analog output A01 & A02 can be set to monitor the status of PID control as show below.</p> |





| NO | features | descriptions |
|----|------------------------|--|
| 2 | AES-Auto Energy Saving | <p>■ 7300PA will auto adjustable voltage to minimize output current for different load.</p>  <p>■ For fans, pumps and HVAC application, the auto energy saving mode will consume less power than ordinary V/F control.</p>  |





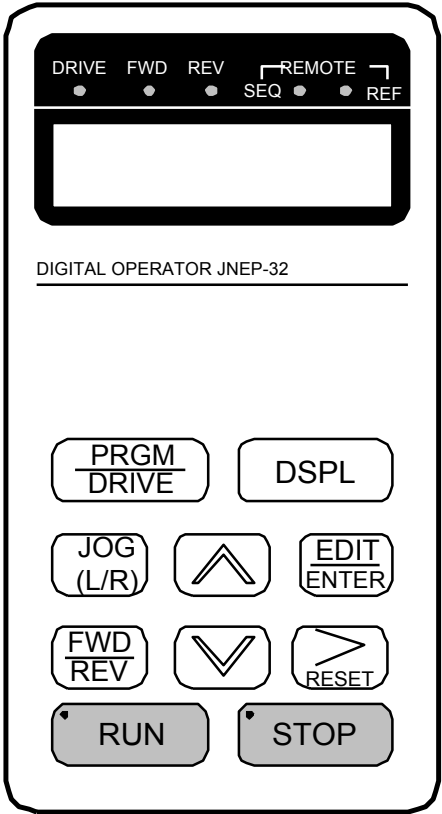
| NO | features | descriptions |
|----|------------|--|
| 2 | (Continue) | <p>■ Auto Energy Saving operation</p> <p>a) Related parameters:</p> <p>Sn-09 = X0XX : Energy Saving function ineffective (general V/F control) = X1XX : Energy Saving function effective</p> <p>Cn-60 = motor code : by setting the inverter capacity and initializing by Sn-01, the same motor code is written to Cn-60, therefore, when the inverter and motor has the same capacity, setting is not need.</p> <p>When output freq. Reached the setting freq. (Frequency command), AES function activates and the inverter output voltage varies with the load.</p>  <p>Motor speed</p> <p>Inverter output voltage</p> <p>Load torque</p> <p>0.2s</p> |

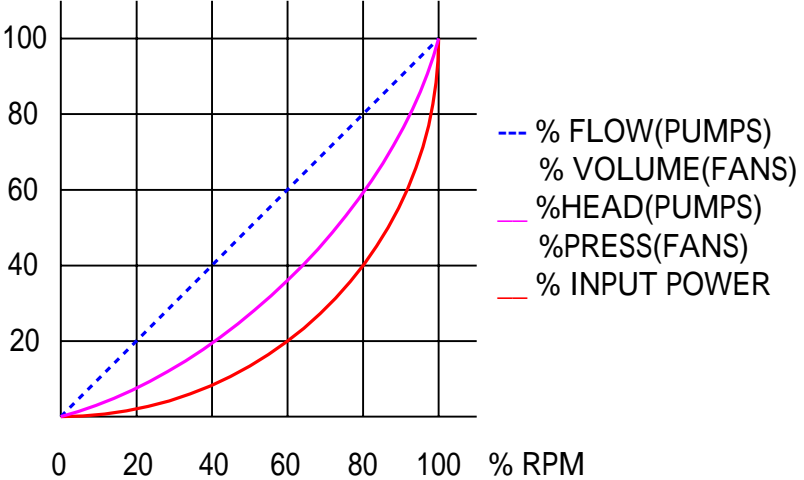
| NO | features | descriptions | | | | | | | | | | | | | | | | | | | | |
|----------------|-------------------------|---|----------------|-------------------------|----|-----|----|-----|----|-----|----|-----|----|-----|----|----|----|----|----|----|-----|---|
| 2 | (Continue) | <p>b) Verification of Energy Saving Power</p> <ul style="list-style-type: none"> • Energy saving power can be verified by comparing power in V/F control mode operation with power in the Energy Saving mode operation. • Power can be monitored by Un-16 • Energy saved value varies according to the load. <ul style="list-style-type: none"> -little energy saving effect is obtained with the load ratio exceeding 70%, as the load become lighter, the effect become larger. • Test example : 220V, 7.5kW <div style="text-align: center; margin-top: 20px;">  <p>The graph illustrates the relationship between load ratio and energy saving power. The y-axis represents Energy Saving power in Watts (W), ranging from 0 to 400. The x-axis represents Load ratio in percentage (%), ranging from 0 to 100. The data points show a non-linear decrease in energy saving power as the load ratio increases, with the most significant savings occurring at lower load ratios.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data points from the Energy Saving power graph</caption> <thead> <tr> <th>Load ratio (%)</th> <th>Energy Saving power (W)</th> </tr> </thead> <tbody> <tr><td>10</td><td>380</td></tr> <tr><td>15</td><td>320</td></tr> <tr><td>20</td><td>270</td></tr> <tr><td>30</td><td>230</td></tr> <tr><td>50</td><td>150</td></tr> <tr><td>70</td><td>80</td></tr> <tr><td>80</td><td>50</td></tr> <tr><td>90</td><td>30</td></tr> <tr><td>100</td><td>0</td></tr> </tbody> </table> </div> | Load ratio (%) | Energy Saving power (W) | 10 | 380 | 15 | 320 | 20 | 270 | 30 | 230 | 50 | 150 | 70 | 80 | 80 | 50 | 90 | 30 | 100 | 0 |
| Load ratio (%) | Energy Saving power (W) | | | | | | | | | | | | | | | | | | | | | |
| 10 | 380 | | | | | | | | | | | | | | | | | | | | | |
| 15 | 320 | | | | | | | | | | | | | | | | | | | | | |
| 20 | 270 | | | | | | | | | | | | | | | | | | | | | |
| 30 | 230 | | | | | | | | | | | | | | | | | | | | | |
| 50 | 150 | | | | | | | | | | | | | | | | | | | | | |
| 70 | 80 | | | | | | | | | | | | | | | | | | | | | |
| 80 | 50 | | | | | | | | | | | | | | | | | | | | | |
| 90 | 30 | | | | | | | | | | | | | | | | | | | | | |
| 100 | 0 | | | | | | | | | | | | | | | | | | | | | |

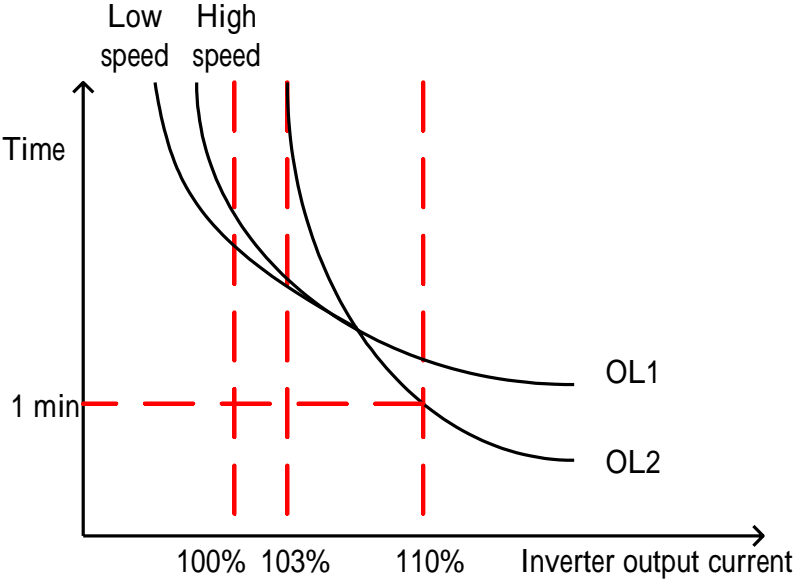
| NO | features | descriptions |
|----|---|--|
| 3 | IPL- Input Phase Loss protection | <p>■ For HVAC application Bypass-Inverter Mode switching.</p>  <p>Input phase loss protection</p>   <p>IPL function is disabled in the following cases</p> <ul style="list-style-type: none"> • Stop running • Decelerating • Output Current $\leq 30\% \times$ INV rated current • IPL protection function is disable (Sn-13=xxx) • When "A/D Fault CPF05" |

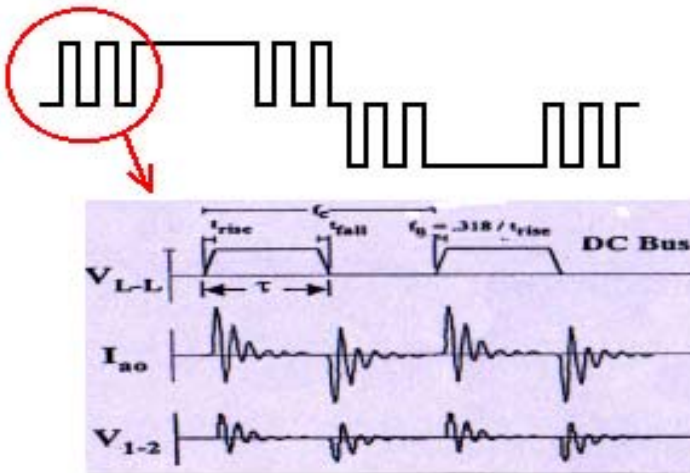
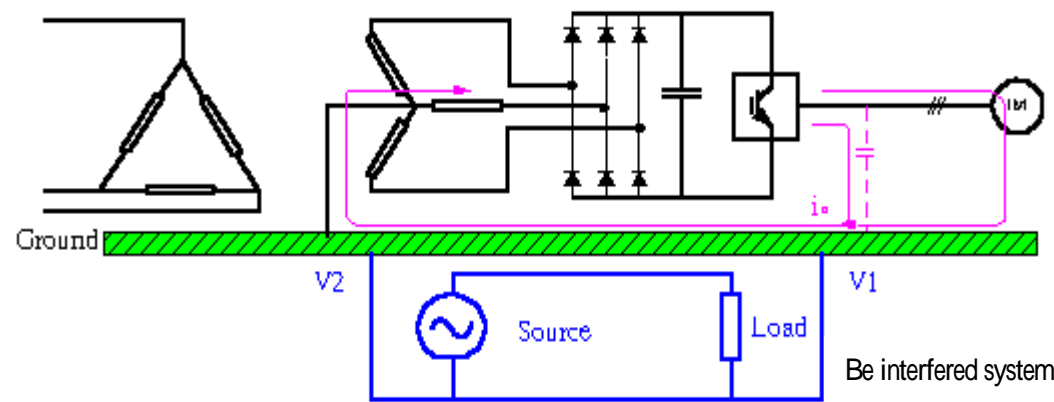
| NO | features | descriptions |
|----|--|--|
| 4 | OPL- Output Phase Loss protection | <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="margin-top: 20px;">OPL function is disabled in the following cases</p> <ul style="list-style-type: none"> • Stop running • DCDB • Output current $\leq 30\% \times \text{INV rated current}$ • OPL protection function is disable (Sn-13=xx x) • When "A/D Fault CPF05" |

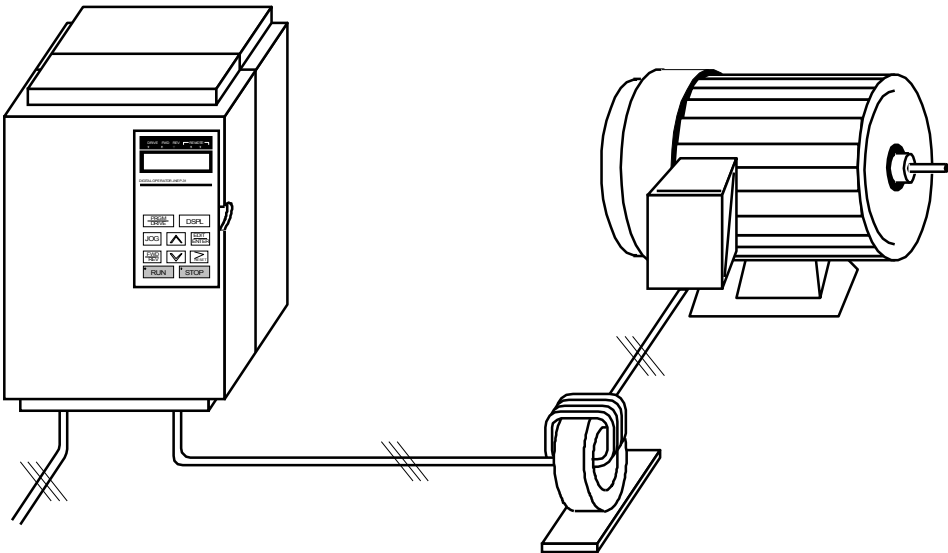
| NO | features | descriptions |
|----|-----------------------------|--|
| 5 | Digital LCD operator | <ul style="list-style-type: none"> • Use Graphic LCD, Dual language(Chinese & English) • Big size LED operator(optional) • Key function similar to as existent TECO inverter • LCD operator , Memory built in , used us Copy unit • Local Remote (L/R) switch key function <p style="text-align: center;"> (1) 7200GA (2) 7200MA (3) 7300PA </p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">LED OP</div> <p>JNEP-12</p>  </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">LCD OP</div> <p>JNEP-31</p>  </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">LCD OP</div> <p>JNEP-32</p>  </div> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">LED OP</div> <p>JNEP-33 (optional)</p>  </div> </div> |

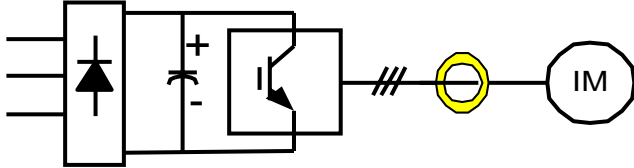
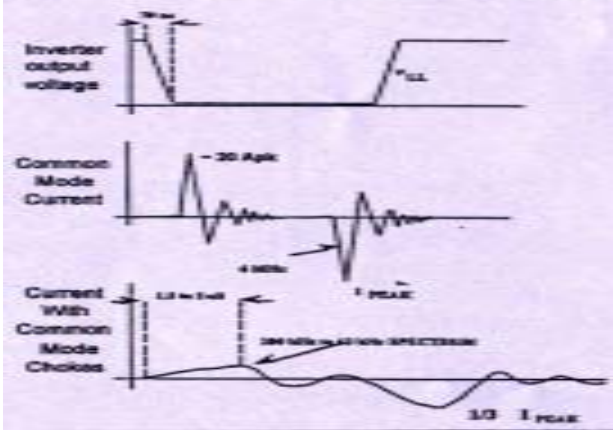
| NO | features | descriptions |
|----|--------------|--|
| 5 | (continue) | <p>• Local/Remove (L/R) function Key</p> <p>-Local ode : Frequency Reference (Fcmd) and RUN/STOP command are controlled by digital operator.</p> <p>-Remote mode : Frequency Reference (Fcmd) and RUN/STOP command are controlled by terminal or RS-485 option card</p> <p>SEQ & REF LED light</p> <p>Sn-05 = OXXX :  Key is used as  key function</p> <p>Sn-05 = 1XXX :  Key is used as  key function</p>  |

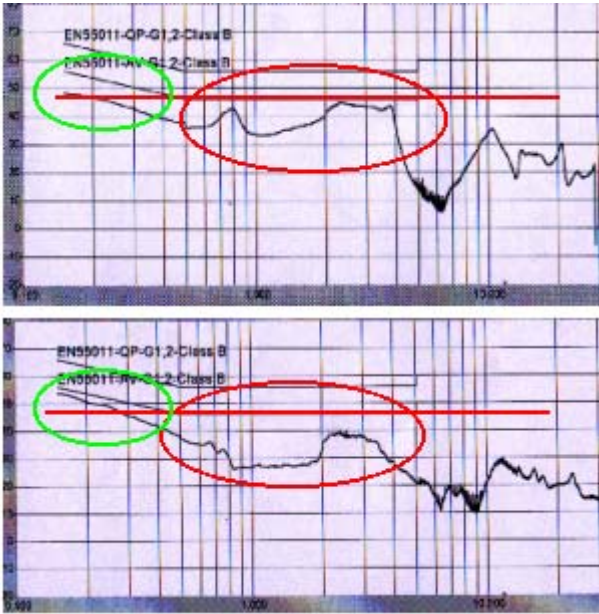
| NO | features | descriptions |
|----|-------------------|--|
| 6 | Overload Capacity | <p>NEMA: Constant Torque – 150%, 1min Variable Torque – 100%,1min ~ 125%, 1min</p> <p>Variable speed operation of Fans, Pumps or Blowers.</p> <ul style="list-style-type: none"> - Flow: $Q \propto N$ (the change in flow is directly proportional to the change in speed) - Pressure : $H \propto N^2$ (Pressure increase proportional to the square of speed) - Horsepower (HP) : $P \propto N^3$  <p>Generally fans and pumps are operated below the base speed (i.e. 1.0pu)</p> <ol style="list-style-type: none"> (1) The horsepower needed is rapidly increased when speed over the base speed. (2) The efficiency of pump or fan will decrease when speed over the base speed. |

| NO | features | descriptions |
|----|------------|--|
| 6 | (Continue) | <p>■ Over load capacity of 7300PA : 110% for 1 minute.</p> <p>OL2: Inverter Overload Protection – 110% of inverter rated current for 1 min (the electronic thermal overload relay is active from 103%)</p> <p>- OL2 tripped, the inverter can be reset to run again after 5minutes.</p> <p>OL1: Motor overload protection – the OL1 electronic thermal overload relay is active from 100% (Cn09 is the 100% base)</p>  |

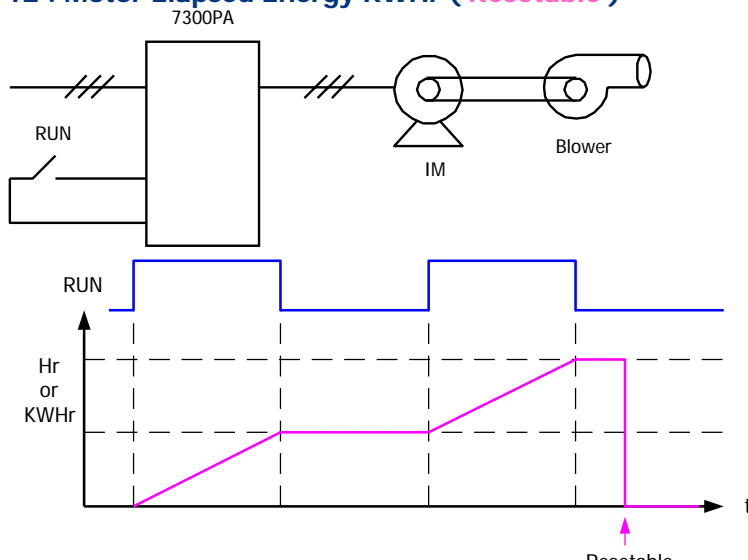
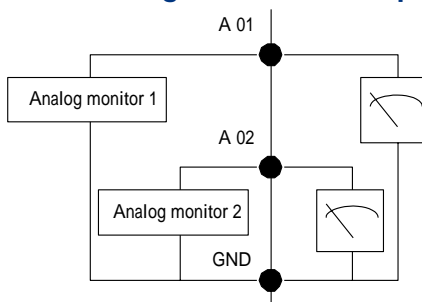
| NO | features | descriptions |
|----|---|--|
| 7 | Output Zero phase filter (CM choke) built-in | <p>■ The common mode noise source of inverter</p> <ul style="list-style-type: none"> • Noise induced by PWM  <p>INV CM noise path</p>  |

| NO | features | descriptions |
|----|--------------|---|
| 7 | (continue) | <p>■ How to reduce CM noise</p> <p>(1) Increased PWM rising time (t_r) → increased IGBT switching loss.</p> <p>(2) Inserted ACL → big size, expensive, reduced fundamental voltage, reduced motor's torque</p> <p>(3) CM ferrite core option → small space, low cost and good performance</p> <p>-All the line wire of U/T1, V/T2, W/T3 phase must pass through the same CM ferrite core in the same winding sense.</p>  |

| NO | features | descriptions |
|----|--------------|--|
| 7 | (continue) | <p>■ 7300PA 220V 5~125HP , the C.M ferrite core is built-in as standard to reduce the C.M noise. 440V 5~300HP</p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: right; margin-top: 20px;"> <p>$t_r = 0.05 \mu s \sim 0.2 \mu s$</p> <p>without core – noise frequency $f_n = 1.6 \sim 6.36 \text{ MHz}$ $di/dt = 200 \text{ A/us}$</p> <p>with core ---- noise frequency $f_n = 63.6 \sim 212 \text{ KHz}$ $di/dt = 1 \text{ A/us}$</p> </div> |

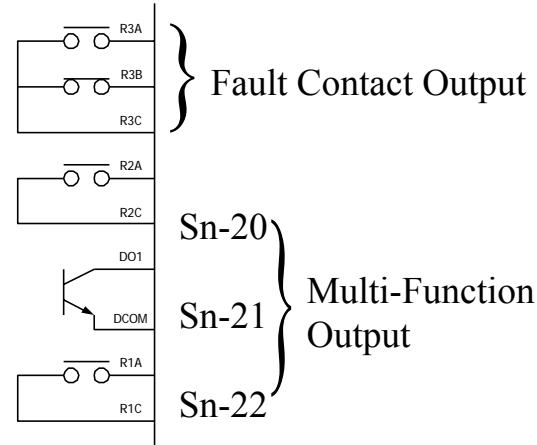
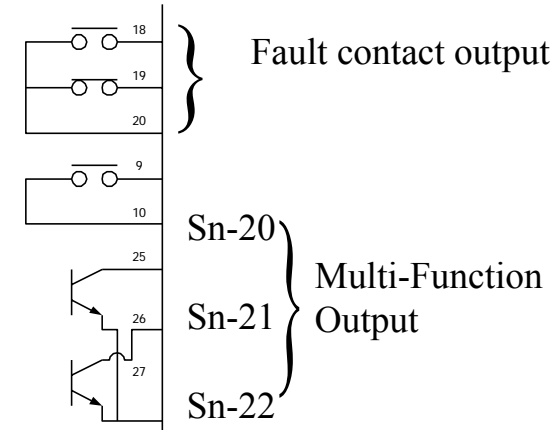
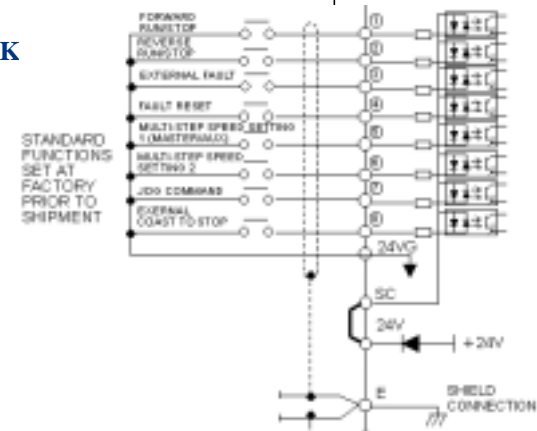
| NO | features | descriptions |
|----|--------------|---|
| 7 | (continue) | <ul style="list-style-type: none"> • Effects of C.M ferrite core • Conduction EMI <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="margin-left: 20px;"> <ul style="list-style-type: none"> • Without CM core : 1~6MHz conduction EMI is higher • With CM core : 1~6MHz conduction EMI is reduced (But 60-200Khz noise is increased) -The EN55011 standard allow higher noise Level at low frequency range (under 500KHz) </div> </div> |

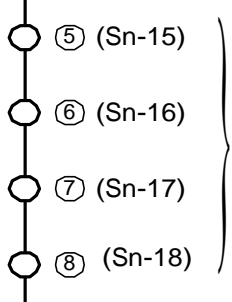
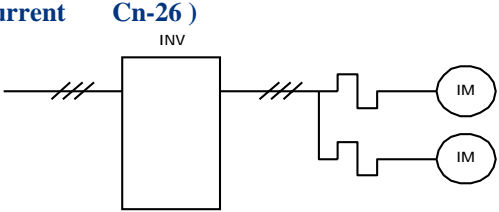
| NO | features | descriptions |
|----|-------------------|---|
| 8 | Monitor functions | <p>• The Inverter Output status can be monitored by Un-XX parameters.</p> <p>The diagram illustrates the connection between a 7300PA inverter and a motor (IM). The inverter's output terminals (R, S, T) are connected to the motor's input terminals (U, V, W). The output current is labeled I_{out} and the output voltage is labeled V_{out}. The power factor is indicated as $PF = \cos$. The diagram also shows the input side and output side of the inverter, and the motor side.</p> <ul style="list-style-type: none"> ● Output Current I_{out} : Un-03 ● Output Voltage V_{out} : Un-04 ● Output power PF : Un-07 ● Output power kW : Un-06 |

| NO | features | descriptions |
|----|--------------|---|
| 8 | (Continue) | <p>■ The status of motor elapsed run hours and energy :</p> <ul style="list-style-type: none"> • Un-11 : Motor Elapsed Run Hours Hr (Resetable) • Un-12 : Motor Elapsed Energy KWHr (Resetable)  <p>■ Monitoring the inverter output status by analog meter</p>  <ul style="list-style-type: none"> Sn-26=02 : A01 = output current =03 : A01 = output voltage =05 : A01 = output power Sn-27=02 : A02 = output current =03 : A02 = output voltage =05 : A02 = output power |

| NO | features | descriptions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|--|---|----------------------|-------------------------------|--------------|--|-------|--------|----|-------------------|--------------------|-------|----|------------------|---------------------|----|----------------|---------------------|----|----------------|------------------------|----|------------|--------------------------------------|----|--------------|-----------------------|----|--------------------|-------|----|--------------------|--------|----|--------------------|-------|----|------------------------------|-------|----|---------------------|----------|
| 9 | Multi-Function Input/output interface | <p>(1) 2 Analog Outputs</p> <ul style="list-style-type: none"> The multi-function analog output AO1 & AO2 can be set to monitor the following 11 status items as show below. <div data-bbox="986 254 1391 544" data-label="Diagram"> </div> <table border="1" data-bbox="694 568 1685 1200"> <thead> <tr> <th rowspan="2">Sn-26, Sn-27 setting</th> <th rowspan="2">Monitor display (LCD display)</th> <th colspan="2">descriptions</th> </tr> <tr> <th>input</th> <th>output</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>Frequency command</td> <td>0Hz~max. frequency</td> <td rowspan="11">0~10V</td> </tr> <tr> <td>01</td> <td>Output frequency</td> <td>0Hz ~max. frequency</td> </tr> <tr> <td>02</td> <td>Output current</td> <td>0~INV rated current</td> </tr> <tr> <td>03</td> <td>Output voltage</td> <td>0~rated voltage(Cn-01)</td> </tr> <tr> <td>04</td> <td>DC voltage</td> <td>220V : 0~400 VDC 440V : 0~800 VDC</td> </tr> <tr> <td>05</td> <td>Output power</td> <td>0~max. motor capacity</td> </tr> <tr> <td>06</td> <td>VIN analog command</td> <td>0~10V</td> </tr> <tr> <td>07</td> <td>AIN analog command</td> <td>4~20mA</td> </tr> <tr> <td>08</td> <td>AUX analog command</td> <td>0~10V</td> </tr> <tr> <td>09</td> <td>PID detected value (VIN+AIN)</td> <td>0~10V</td> </tr> <tr> <td>10</td> <td>RS485 communication</td> <td>0~100%*1</td> </tr> </tbody> </table> | Sn-26, Sn-27 setting | Monitor display (LCD display) | descriptions | | input | output | 00 | Frequency command | 0Hz~max. frequency | 0~10V | 01 | Output frequency | 0Hz ~max. frequency | 02 | Output current | 0~INV rated current | 03 | Output voltage | 0~rated voltage(Cn-01) | 04 | DC voltage | 220V : 0~400 VDC 440V : 0~800 VDC | 05 | Output power | 0~max. motor capacity | 06 | VIN analog command | 0~10V | 07 | AIN analog command | 4~20mA | 08 | AUX analog command | 0~10V | 09 | PID detected value (VIN+AIN) | 0~10V | 10 | RS485 communication | 0~100%*1 |
| Sn-26, Sn-27 setting | Monitor display (LCD display) | descriptions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | input | output | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 00 | Frequency command | 0Hz~max. frequency | 0~10V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | Output frequency | 0Hz ~max. frequency | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 02 | Output current | 0~INV rated current | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 03 | Output voltage | 0~rated voltage(Cn-01) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 04 | DC voltage | 220V : 0~400 VDC 440V : 0~800 VDC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 05 | Output power | 0~max. motor capacity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 06 | VIN analog command | 0~10V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 07 | AIN analog command | 4~20mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 08 | AUX analog command | 0~10V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 09 | PID detected value (VIN+AIN) | 0~10V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | RS485 communication | 0~100%*1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

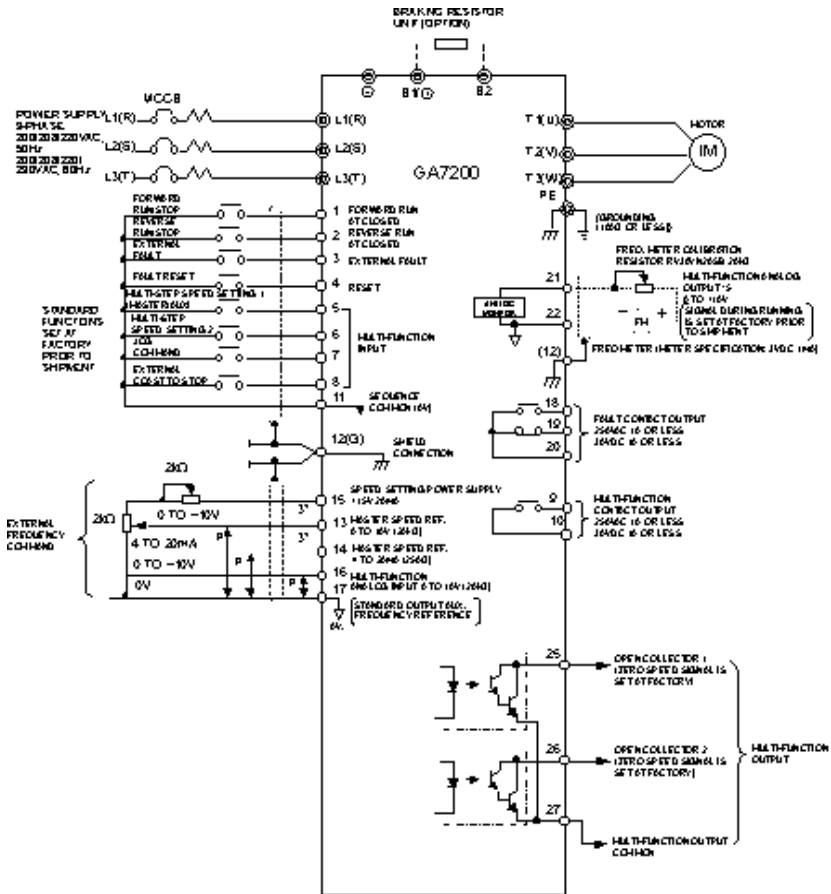
| NO | features | descriptions |
|----|--------------|--|
| 9 | (Continue) | <p>The output voltage of multi-function analogy output A01 and A02 can be shifted up or down by Bn-08 and Bn-09, Bn-12 individually→used to adjust the external analogy meter scale</p> <p>Bn-08 : A01 Bias Bn-09 : A02 Bias Bn-11 : A01 Bias Bn-12 : A01Bias</p> <p>Output voltage</p> <p>10V</p> <p>0V</p> <p>0%</p> <p>100%</p> <p>Monitor items</p> <p>Gain(Bn-11 or Bn-12)>1.00</p> <p>Gain(Bn-11 or Bn-12)=1.00 Bias(Bn-08 or Bn-09)=0.0%</p> <p>Bias(Bn-08 or Bn-09) < 0.0%</p> <p>Bias(Bn-08 or Bn-09) > 0.0%</p> |

| NO | features | descriptions |
|----|--------------|--|
| 9 | (Continue) | <p>(2)7300PA with three Relay outputs.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>7300PA</p>  </div> <div style="text-align: center;"> <p>7200GA</p>  </div> </div> <p>(3) SINK / SOURCE type input Interface The terminal (1)~(8) can be connect as SINK or SOURCE type input interface</p>  |

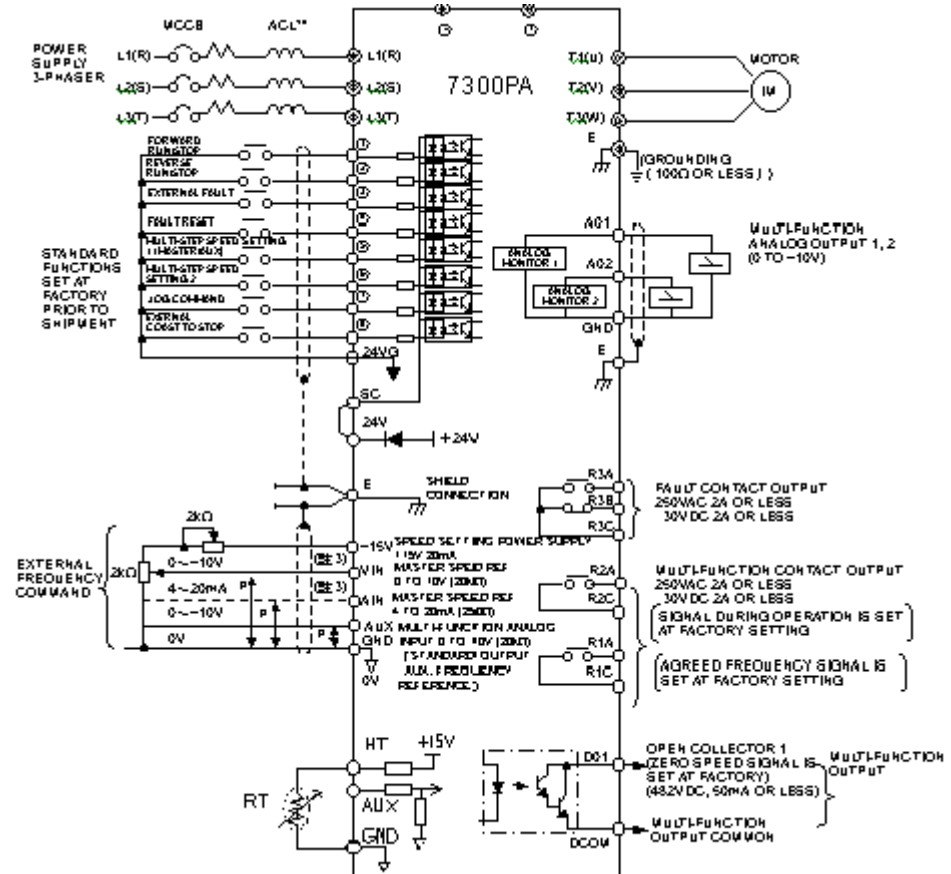
| NO | features | descriptions |
|----|--------------|--|
| 9 | (Continue) | <p>(4) Motor Overload protection (PTC thermistor input terminal)</p> <p>Overload protections</p> <p>OL1 : Motor overload (s/w electronic thermal overload)</p> <p>OL2 : Inverter overload (s/w, 110 %, 1min)</p> <p>OL3 : Overtorque (Protect the machine, When output current Cn-26)</p> <p>• Over heat protection</p> <p>OH : Inverter heat sink over heat.</p> <p>OH2 : Over heat alarm (External alarm signal input)</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div> <p>=OB: "OH Alarm"(flash) , Inverter still can be work..</p> </div> </div> <p>• OH3 : Motor Over Heat (PTC thermistor)</p> <p>When(1) heavy duty operation</p> <p style="padding-left: 40px;">(2) higher ambient temperature</p> <p>-Select the motor with PTC thermister to protect the motor to avoid over temperature burn-out or filter hazard.</p> <p>-The 7300PA is designed with the British standard PTC thermistor interface.</p> <div style="text-align: right; margin-top: 20px;">  </div> |

| NO | features | descriptions |
|----|--------------|--|
| 9 | (Continue) | <p>■ PTC thermistor</p> <p>Sn09=0C :</p> <ul style="list-style-type: none"> • The motor temperature detected sensor (PTC thermistor) R_T connected to terminal MT-AUX. • The motor overheat protection active when $R_T \geq 1330\Omega$ and the delay time is over the motor overheat protection time (Cn-63), digital operator will display "Motor Overheat OH3" alarm and inverter stop the motor depend on the stopping method set in 3rd and 4th digits of Sn-12 and the fault contact signal is output. • The motor overheat (OH3) alarm can be reset when $R_T \leq 550\Omega$. • The typical characteristic of PTC thermistor R_T must follow the British Standard: <ul style="list-style-type: none"> Tr -5 : $R_T \leq 550$ Tr +5 : $R_T \geq 1330$ Tr -20 : $R_T \leq 250$ Tr +15 : $R_T \geq 4000$ <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div data-bbox="571 856 894 1128" style="text-align: center;"> <p>PTC Thermistor</p> </div> <div data-bbox="1104 885 1599 1170" style="text-align: center;"> </div> </div> |

7200GA

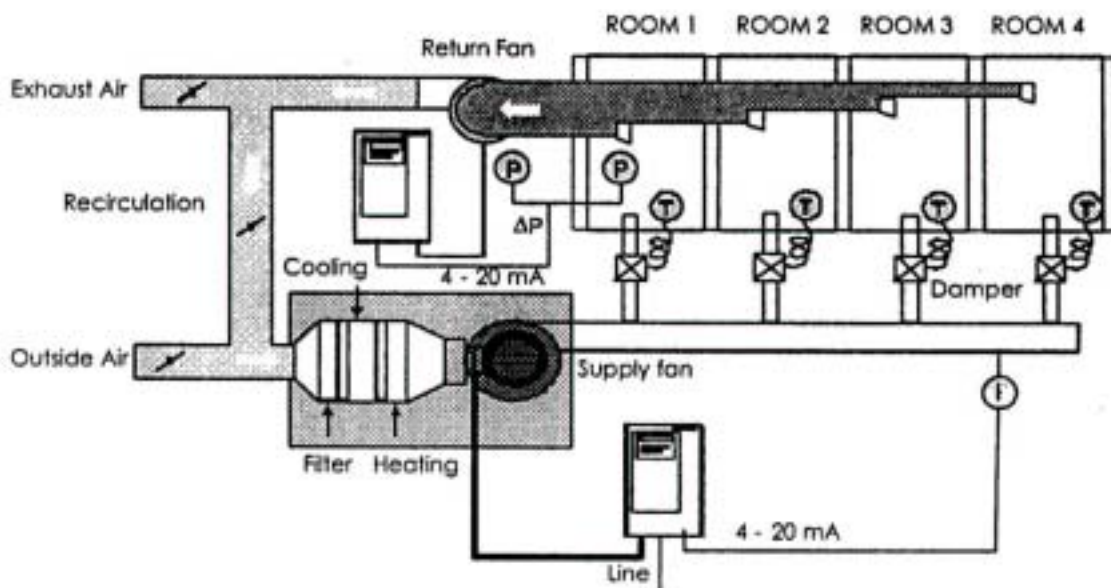


7300PA

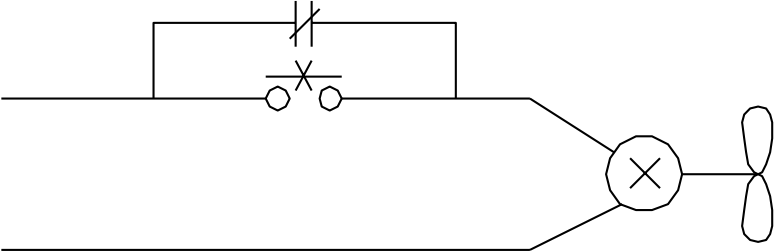
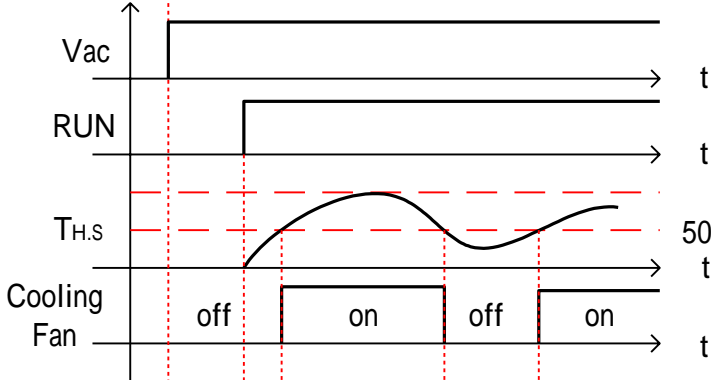


Terminal Marks

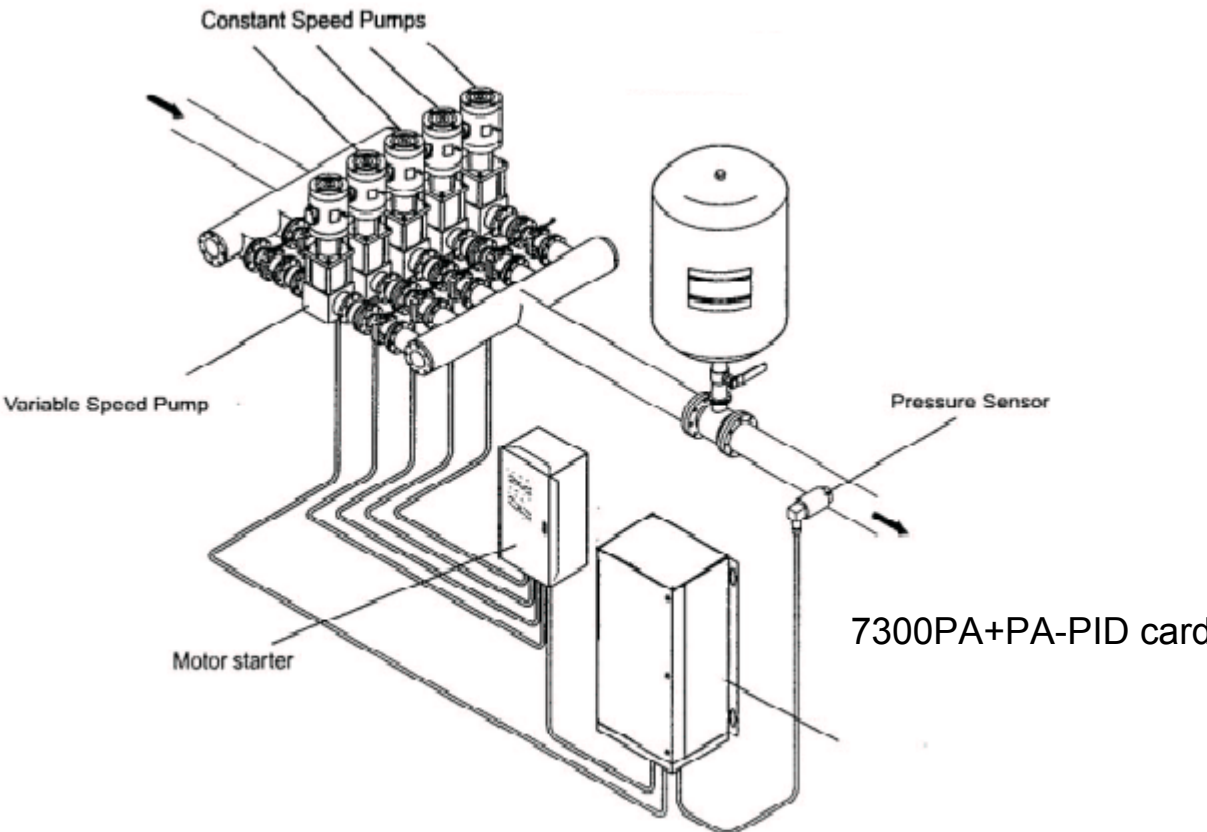
| NO | features | descriptions |
|----|----------------------|---|
| 10 | RS-485 communication | <p>• These option cards can be monuted on the upper side of the control board CN2 connect.</p> <p>The diagram illustrates the 7300PA control board with the following components and connections:</p> <ul style="list-style-type: none"> 7300PA: The main control board. LCD OP: Connected to CN1. IM: Connected to the right side of the board. CN1 and CN2: Connector ports for communication cards. Option Cards connected to CN2: <ul style="list-style-type: none"> PA-M: MODBUS CARD PA-P: PROFIBUS CARD PA-D: DEVICENET CARD (planning) PA-N2: METASYS N2 (planning) PA-P ID: 1-8 PID Relay CARD <p>Legend: RS-232 ← → RS-485</p> |

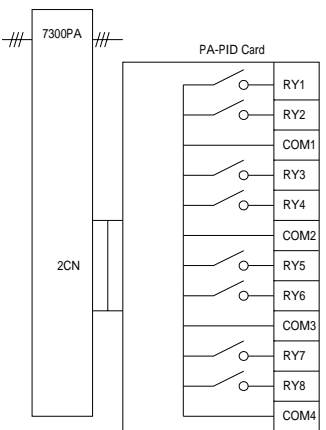
| NO | features | descriptions |
|----|-----------------------------------|--|
| 11 | PID Sleep/Wake-up function | <ul style="list-style-type: none"> • The PID Sleep/Wake-up functions can be used to save energy and improve the system working life time - e.g Air condition application of Building.  <p>The diagram illustrates a building air conditioning system. It features a central unit with a Return Fan at the top and a Supply fan at the bottom. The Return Fan draws air from ROOM 1, ROOM 2, ROOM 3, and ROOM 4, which is then exhausted. The Supply fan draws in Outside Air, passes it through a Filter Heating section, and then through a Cooling coil. The air is then distributed to the rooms through dampers. The system is equipped with various sensors: pressure sensors (P) for differential pressure (ΔP) and room pressure, temperature sensors (T) in each room, and a current sensor (I) on the supply line. Control lines (4-20 mA) connect the sensors to the system's control logic. A Line connection is also shown at the bottom.</p> |

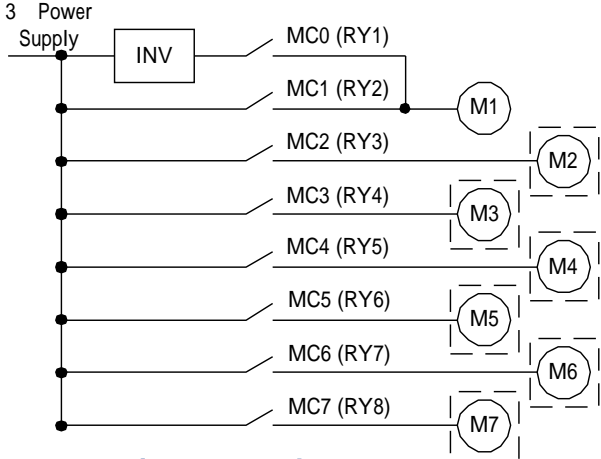
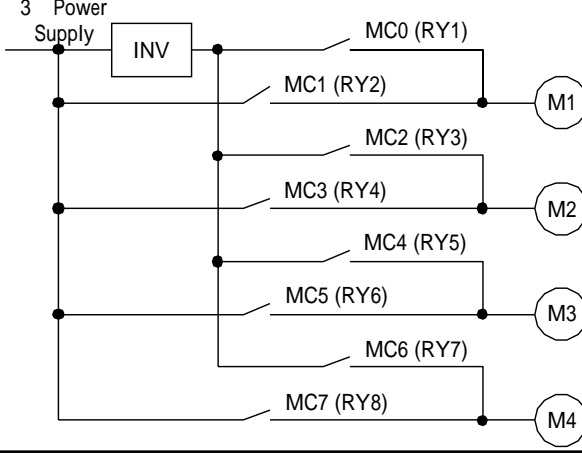
| NO | features | descriptions |
|----|--------------|---|
| 11 | (continue) | <p>■ When the process demand is very low, the PID sleep function stop the motor rather than allow sustained operation at a low speed. If the process demand remains low the motor will cycle off. When the demand return to normal . The driver resumes normal PID regulation and the driver restarts automatically .</p> <p>The diagram illustrates the PID sleep function. It consists of a control loop where the PID Aimed Value and PID feedback Value are compared. The resulting error signal is processed by the PID control block, which outputs the Frequency Command (f_{CMD}). This command is then processed by the Soft. start block to produce the Output frequency (f_{OUT}).</p> <p>The graph below shows the frequency response during a sleep and wake-up cycle. The Y-axis represents Frequency (Hz) and the X-axis represents time. Key parameters shown include:</p> <ul style="list-style-type: none"> Wake-up frequency (Bn-20) Sleep frequency (Bn-18) Min. output frequency (Cn-07) Sleep Delay time (Bn-19) Wake-up Delay time (Bn-19) Frequency command (f_{CMD}) Output frequency (f_{OUT}) <p>The graph is divided into two phases: Sleep and Wake-up.</p> |

| NO | features | descriptions |
|----|-----------------------------------|--|
| 12 | Cooling Fan on/off control | <p>■ Sn-13 = - 0 - - : When inverter power on the cooling fan start running (standard setting).</p> <p>- 1 - - : When inverter power on and heat sink temperature over 50 , the cooling fan start running.</p> <p>Increased cooling fan's lifetime & reduce noise & minimized losses. (220V: 30~125HP, 440V: 40~300HP)</p>   |

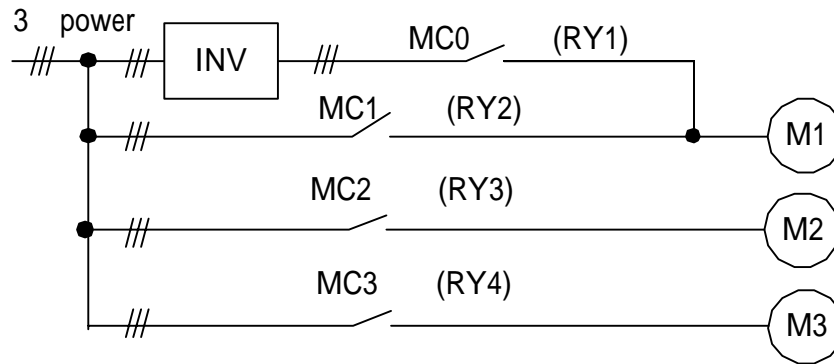
| NO | features | descriptions |
|----|------------------------|--|
| 13 | DRIVE/PRGM Mode | <ul style="list-style-type: none"> • The DRIVE/PRGM mode operations similar to as existent TECO inverter. • 7300PA PRGM mode added monitor constants (Hn-), Can monitor interface status when INV stop. <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">7200GA</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">7300PA</div> </div> |

| NO | features | descriptions |
|----|----------------------------------|---|
| 14 | 1 to 8 PID Control Card (PA-PID) | <p>Cascade control - 7300PA can used the PA-PID option card to control max 7 pumps in a water supply system.</p> <p>-This feature can eliminate the needed for a PLC or pump sequencer.</p> <p>• Cascade control example:</p>  <p style="text-align: center;"><i>Standard cascade control</i></p> |

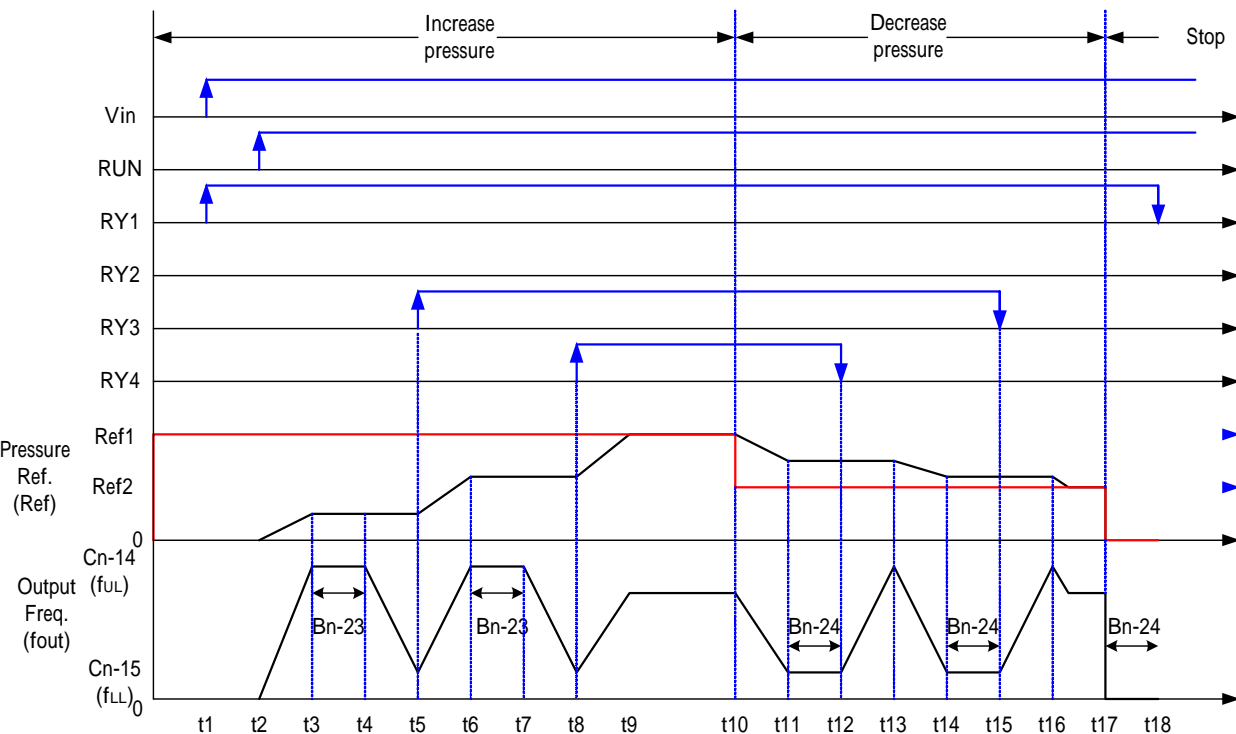
| NO | features | descriptions |
|----|--------------|---|
| 14 | (continue) | <ul style="list-style-type: none"> • PA-PID card: Can be mounted in the upper side of control board CN2 connector. <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> • Related parameters <ul style="list-style-type: none"> • Bn-23 : Freq. Cmd upper-bound delay time • Bn-24 : Freq. Cmd lower-bound delay time • Bn-25 : MC ON/OFF delay time • Bn-26 : pump ON/OFF detection level • Sn-30 : pump operation mode <ul style="list-style-type: none"> =0 : PA-PID card ineffective =1 : fixed mode (First-run-last-Stop) =2 : fixed mode (Stop the pump driven by INV) =3 : fixed mode (First-run-first-Stop) =4 : cycled mode(First-run-first-Stop) =5 : cycle mode (Stop the pump driven by INV) • Sn-31 : PA-PID Card Relay2 valid/invalid • Sn-32 : PA-PID Card Relay3 valid/invalid • Sn-33 : PA-PID Card Relay4 valid/invalid • Sn-34 : PA-PID Card Relay5 valid/invalid • Sn-35 : PA-PID Card Relay6 valid/invalid • Sn-36 : PA-PID Card Relay7 valid/invalid • Sn-37 : PA-PID Card Relay8 valid/invalid <p style="margin-left: 20px;">Application cases :</p> <ol style="list-style-type: none"> (1) maintenance (2) Set the corresponding relay invalid where the MC is not used to eliminate the sequence delay. |

| NO | features | descriptions |
|----|--------------|---|
| 14 | (continue) | <p>• Fixed mode and cycled mode connection example :</p> <p>(1) Fixed mode : PA-PID card can control max 7 pumps</p>  <p>(2) Cycled mode : PA-PID card can control max 4 pumps</p>  |

Fixed inverter driving mode example



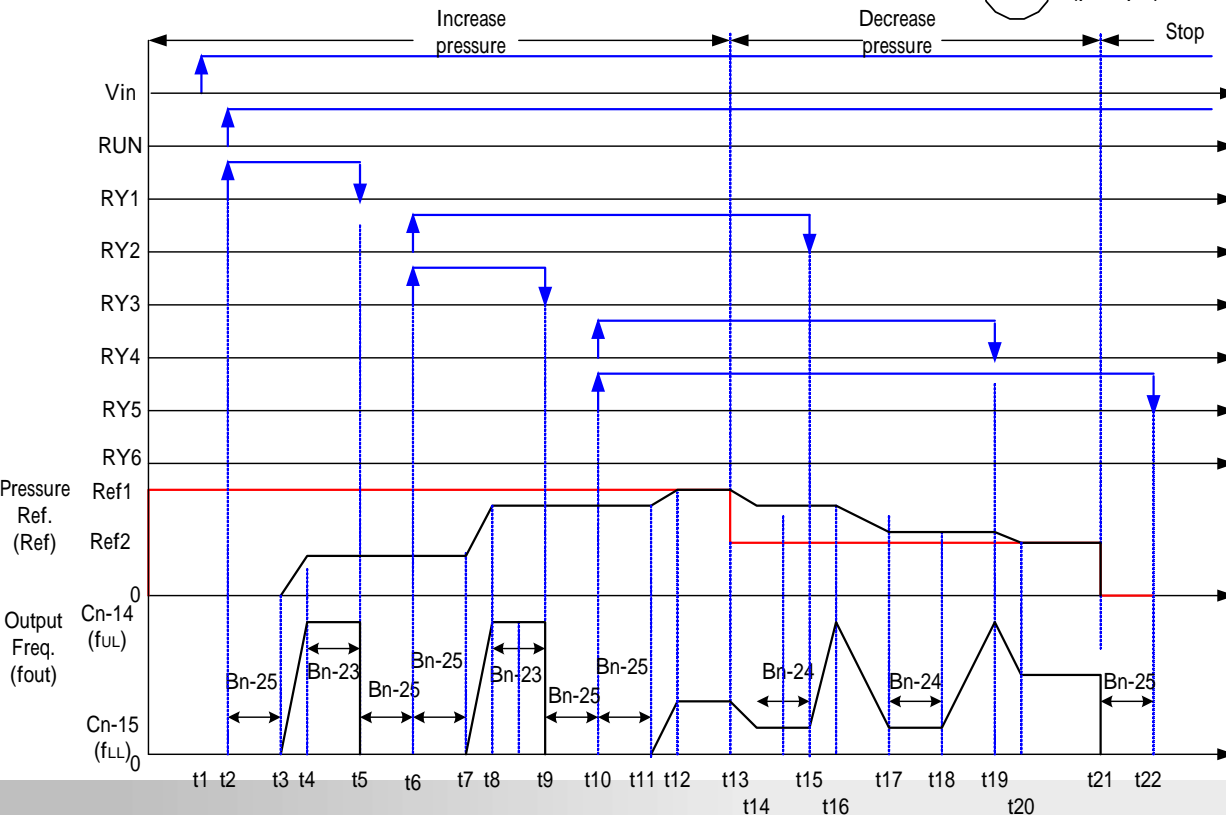
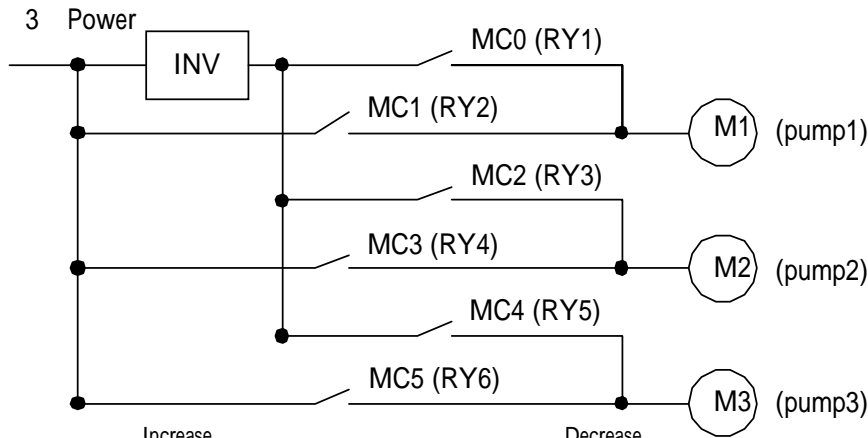
• Operation sequence



- t1 : Power ON
- t2 : INV RNU, $f_{out} : 0 \rightarrow f_{UL}$
- t3 : PID control, $|Ref-fbk| > Bn-26$
the system is ready to turn on 2nd pump
- t4 : $(t4-t3) = Bn-23$, Freq. Cmd upper-bound delay time
- t5 : $f_{out} : f_{LL} \rightarrow f_{UL}$, RY3 = ON, the 2nd pump added to system
- t6 : 1st pump speed f_{UL} , system pressure increased
- t7 : $(t7-t6) = Bn-23$, system pressure not enough, the 3rd pump is needed to add to system
- t8 : $f_{out} : f_{LL} \rightarrow f_{UL}$, RY3=ON, 3rd pump added to system
- t9 : 1st pump accel by PID control, $f_{out} < f_{UL}$ due to enough pressure
- t10 : Pressure Ref2 = Ref1, the pump3 is ready to disconnect from system
- t11 : $f_{out} \rightarrow f_{LL}$ system pressure decrease.
- t12 : $(t12-t11) = Bn-24$, RY4=off, pump3 disconnected.
- t13 : $f_{out} \rightarrow f_{UL}$, by PID control, pump2 is ready to disconnect, from system due to $|Ref - fbk| > Bn-26$.
- t14 : $f_{out} : f_{UL} \rightarrow f_{LL}$
- t15 : $(t15-t14) = Bn-24$, pump2 disconnected after Bn-24 delay
- t16 : pump1 driven by INV, to adjust the pressure by PID control
- t17 : pressure set = 0, pump1 disconnected from system.
- t18 : Bn-24 delay, RY1=off, pump1OFF.

Fixed inverter driving mode example

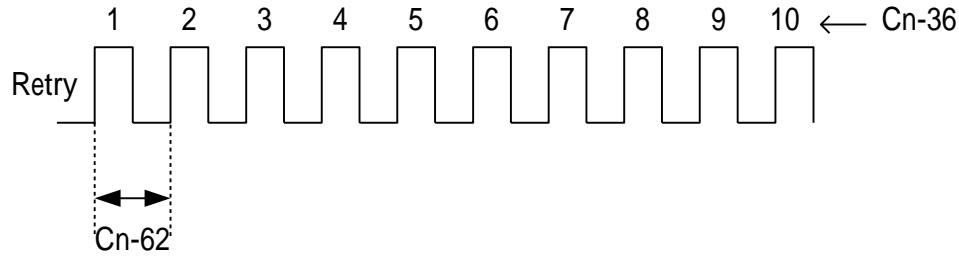
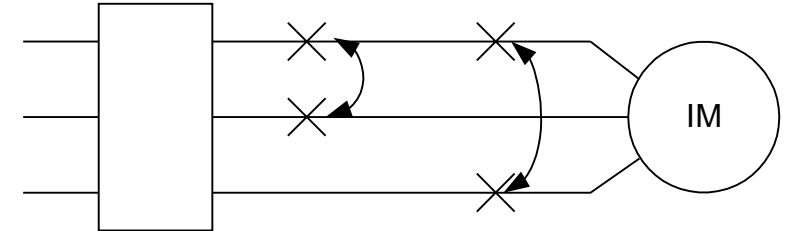
Cycled inverter driving mode example

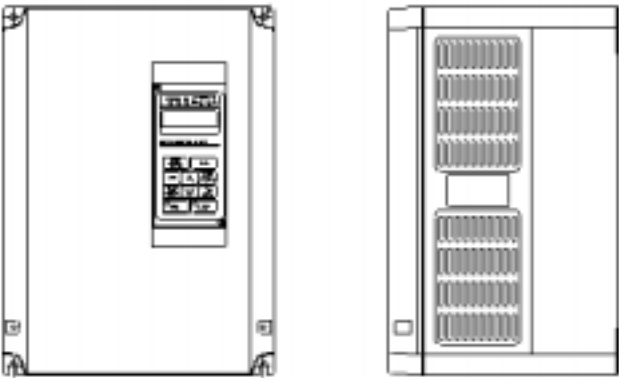


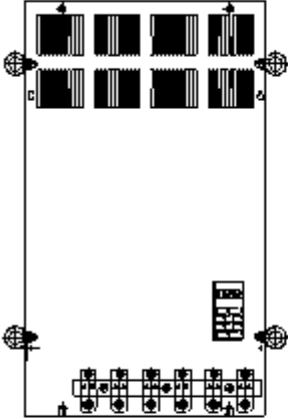
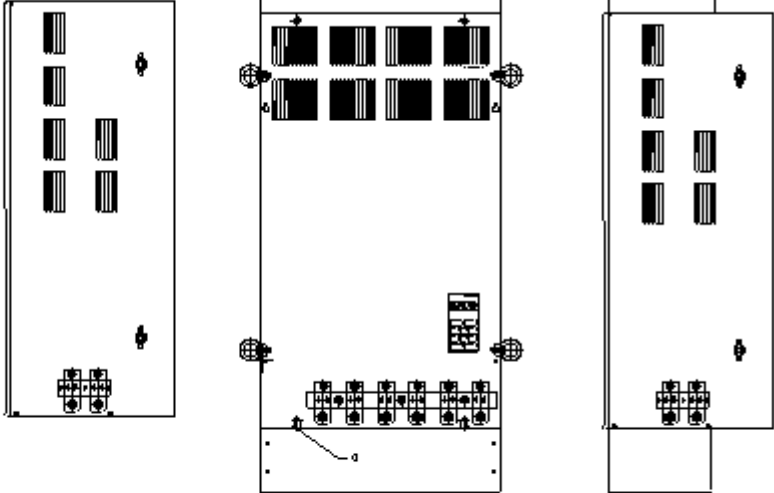
- t1 : Power ON.
- t2 : INV RUN,, RY1=ON, pump1 add to system.
- t3 : t3-t2=Bn-25(MC ON/OFF delay time) fout : 0 fUL system pressure increasing.
- t4 : By PID control, |Ref-fbk| > Bn-26, pump1 bypass to power system pump2 ready to add to system.
- t5 : INV B.B then pump2=ON, (RY2=RY3=ON).
- t6 : RY2=RY3=ON, INV output after Bn-25 delay time to make sure MC2 is totally turned ON.
- t7 : fout由0 fUL, system pressure increasing.
- t8 : pump2 by PID operation, |Ref-fbk| > Bn-26 pump2 by pass to power system and pump3 ready to add to system.
- t9 : INV B.B after Bn-25 delay time, RY4=RY5=ON
- t10 : RY4=RY5=ON
- t11 : INV output after Bn-25 delay to make sure MC3=off and MC4=ON.
- t12 : fout : 0 fUL, system pressure increasing, by PID operation |Ref-fbk| < Bn-26 fout stop increasing.
- t13 : Pressure Ref. Ref1 Ref2, pump3 control by PID operation, fout fLL
- t14 : After Bn-24 delay time, pump1 disconnected.
- t15 : Pump1 disconnected, by PID operation |Ref-fbk| > Bn-26, pump3 speed increasing.
- t16 : By PID control, |Ref-fbk| > Bn-26, INV fout fLL.
- t17 : After Bn-24 delay, pump2 disconnected.
- t18-t20 : INV drives pump3 by PID operation.
- t21 : Pressure Ref. 0, INV B.B
- t22 : After Bn-25 delay time, pump3 disconnected.

Cycled inverter driving mode example

| NO | features | descriptions |
|----|----------|--|
| 15 | Others | <p>(1) Troubleshooting of current detecting circuit :</p> <ul style="list-style-type: none"> • The basic current detecting circuit of 7300PA <div data-bbox="586 396 1146 753" data-label="Diagram"> </div> <p>a)DRIVE mode</p> <ul style="list-style-type: none"> • Used Un-14, 15 to check DCCT function in the power system. Un-14 : U phase DCCT conversion value. Un-15 : W phase DCCT conversion value. • Used Un-16, 17 to check ADC function in the control board. Un-16 : 3 phase rectify current conversion current. Un-17 : ADC Ref. Volt. <p>b) PRGM mode</p> <ul style="list-style-type: none"> • Used Hn-xx parameter to monitor the current detecting circuit during the inverter is stopped. Hn-05 : U phase DCCT conversion value. Hn-06 : W phase DCCT conversion value. Hn-07 : 3 phase rectify current. Hn-08 : ADC Ref. Volt. |

| NO | features | descriptions |
|----|--------------|---|
| 15 | (continue) | <p>(2) Number and time interval of Auto restart are selectable</p> <ul style="list-style-type: none"> • Number of auto restart (Cn-36) : 0~10 • Time interval of auto restart (Cn-26) : 1~20S <p>-> Cn-62=0, the time interval of auto restart=7ms</p>  <p>(3) Output short circuit protection – phase to phase short, phase to neutral short.</p>  <p>(4) Flash memory – function upgrade capability</p> |

| NO | features | Descriptions |
|----|--------------|--|
| 15 | (continue) | <p>(5) DCL built-in (preventive actions for harmonics) 220V 30~125HP 440V 40~300HP alas built-in 5~10% DCL as standard. - P.F : ≥ 0.9 - Current harmonic : 70% -> 35% (5th order) 50% -> 15% (7th order)</p> <p>(6) Braking IGBT built-in 220V 25HP 440V 30HP Braking IGBT was built-in as standard.</p> <p>(7) IP00 and IP20 Enclosure 220V 25HP 440V 30HP Standard enclosure : IP20 (IP:00 by removing the upper and lower cover of IP20)</p> <div style="text-align: center;">  </div> |

| NO | features | Descriptions |
|----|--------------|---|
| 15 | (continue) | <p>220V 30HP 440V 40HP With IP00 & IP20 (specify the enclosure type when ordering)</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>(open chassis type)</p> </div> <div style="text-align: center;">  <p>(wall-mounted type)</p> </div> </div> |

| NO | features | Descriptions |
|----|--------------|--|
| 15 | (continue) | <p>(8) Others</p> <p>a)Local/Remote switch key and Local/Remote operation status in LCD keypad.</p> <p>b)Flying start (Speed search) : To switch commercial power supply and inverter drive without stopping the motor.</p> <p>c)Automatic Restart (Retry) : To prevent machine stop caused by inverter tripping, the time interval can be set (by Cn-62).</p> <p>d)Frequency Bypass (prohibit frequency) : Used to avoid mechanical resonance.</p> <p>e)Momentary Power Failure Protection : To continue operation even when momentary power loss not longer then 2 seconds occurs (Sn-11).</p> <p>f)Frequency Reference Loss Protection : To continue operation even if a failure occurs in higher-order frequency commanding equipment (Sn-06,Sn-20~22).</p> <p>g)Motor Preheat : Using the DC injection at start function (Cn-11,Cn-13) to preheat the motor ensures that no condensate develops in the motor at stop or evaporate condensed water in the motor.</p> <p>h)Etc..</p> |

Product Comparisons

a) Function Comparisons

(1) compare with the other brands

| NO | Items | 7300PA | F7 | P11S | VLT6000 | ACH400 |
|----|---------------|--|---|---------------------------------------|---|--|
| 1 | Capacity | 220V: 5~125HP 440V: 5~400HP | 220V:0.5~150HP 440V:0.5~400HP | 220V 440V:10~375HP | 220V:1.5~60HP 440V:1.5~600HP 550V:1.5~300HP | 220V: 3~100HP 440V: 3~400HP |
| 2 | Overload | 110%, 1min | 120%, 1min | 110% , 1min | 110%, 1min 160%, 5 Sec | 110%, 1min |
| 3 | Keypad | LCD(std),LED(option) (Chinese,English) Copy Unit (max cable length <= 10m) | LED(std), LCD(option) Copy Unit | LCD+LED (Chinese,English,Japanese) | LCD(cable < 3m) | LCD |
| 4 | Communication | Option : •MODBUS •PROFIBUS •DEVICENET •Metasys N2 •1~multi PID card | •RS485 port(built-in) •PROFIBUS •DEVICENET •InterBus •CANopen •Control net •CC Link | •RS485 port(built-in) | •RS-485 port(built-in) | •MODBUS(std) •LonWorks •PROFIBUS •Landis division FLN •Metasys N2 •1~3 PID card |
| 5 | DI | 8 contacts SINK/SOURCE | 7 contacts SINK/SOURCE | 9 contacts SINK | 8 contacts (programmable) (scan time=3ms) | 5 contacts (programmable) (SINK/SOURCE) |
| 6 | DO | RELAY * 3 PHOTO COUPLE * 1 | RELAY * 2 PHOTO COUPLE * 2 | RELAY * 2 PHOTO COUPLE * 4 | Relay * 2 (Relay Card option) | Relay * 2 |
| 7 | AI | 0-10V * 2 4-20mA * 1 | 0-10V * 1 4-20mA * 1 Pulse train *1(0~32KHz) | 0-10V * 1 4-20mA * 1 | 0~10V * 2 4-20mA * 1 (10bit A/D) | 0~10V * 1 4~ 20mA * 1 |
| 8 | AO | (0~10V)*2 | 0~10V * 2 | 0~10V * 1 Pulse o/p * 1 | 2*(4~20mA)(D/A=8 bit) | 1* (0~10V) |
| 9 | DCL | 40HP built in 10% DCL 30HP & 350~500HP with external ACL | 30HP built in DCL 25HP DCL or ACL external | 75HP built in DCL 60HP option | | Built in 3% ACL |
| 10 | C.M choke | Built in | X | X | X | X |

(continue)

| NO | Items | 7300PA | F7 | P11S | VLT6000 | ACH400 |
|----|-----------------------------------|--|--|---|--|---|
| 11 | Phase Loss Protection | •IPL •OPL | •IPL •OPL | •IPL •OPL | •IPL •OPL | •IPL •OPL |
| 12 | PID | O | O | O | O | O |
| 13 | Auto Energy Saving | O | O | O | AEO : (Energy Saving 3~10%) | O |
| 14 | Monitor | Hr, KW, PF, KWHR | Hr, KW | KW, KWHR | Hr, KW, PF, KWHR | KW, KWHR |
| 15 | Motor over heat PTC thermistor | O | O | O | O | (Motor overload Relay-complex metal) Option ON/OFF Motor overload protection |
| 16 | Frequency range | 0.5~ 180Hz | 0~ 150Hz | 0~ 120Hz | 0~120Hz | 0~250Hz |
| 17 | RFI | option | option | option | option | Option |
| 18 | Input Voltage | 220V: 208~240Vac +10,-15% 440V:380V~480V +10,-15% | 220V: 208~240Vac +10,-15% 440V:380V~480V +10,-15% | 220V: 200~240 V 440V:380V~480V +10,-15% | 220V: 200V~240V ± 10% 440V: 380V ~460V ± 10% 550V: 550V ~ 600V ± 10% | 220V: 208V ~ 240Vac 440V: 380 ~ 480V |
| 19 | Enclosure | •IPOO •IP20 | •IPOO •IP20 | •IPOO •IP20 | •IPOO •IP20 •IP54 | •IP21(std) •IP54 |
| 20 | Environmental Condition | 0~45 95%RH | -10~40 (NEMA1) -10~45 (IP00) | 0~50 (IP00) 0~40 (NEMA1) 95 % RH | 40 max (35 max ~ 24Hr ave.) | 0~40 (4KHz) 95%RH |
| 21 | Standard | CE,UL,CUL,C-tick | CE,UL,CUL | CE,UL,CUL | CE, UL, C-tick, CUL | CE, UL, CUL |
| 22 | PF,efficient Data | O | O | O | PF=0.90(at rated load) EFF. > 0.98 | PF=0.98(for fundamental) EFF. < 0.97 |
| 23 | Max. SC Current | | | | 100,000A | |

(continue)

| NO | 項目 | 7300PA | F7 | P11S | VLT6000 | ACH400 |
|----|-------------------------|--|---|------|---|---|
| 24 | 12 pulse option | •12pulse external option 18pulses external option | •20HP 12pulses external option •25HP 12pulses(std) | | •12pulses (option) | |
| 25 | Heat Sink OH | 95 105 (350~500HP) | 110 (125,150HP) 100 (75,100HP) 95 the others | | 90 (IPOO, IP21) 80 (IP54) | 95 |
| 26 | OV | 410V(220V) 820V(440V) | 410V (220V) 820V (440V) | | | 420V(1.25Vdc for 240Vac) 661V(for 380~ac415Vac) 765(for 440~480Vac) |
| 27 | UV | 190V(220V) 380V(440V) | 190V (220V) 380V (440V) | | | 190V(0.65Vdc for 208V) 436V(for 380~415Vac) 505V(for 440V~480Vac) |
| 28 | Multi-step speed ref. | 9 steps | 9 steps | | | |
| 29 | PID Sleep mode | Sleep freq Wake up freq Sleep timer | Sleep freq Sleep timer | --- | Sleep freq Wake up freq Sleep timer | Sleep freq Wake up freq Sleep timer |
| 30 | Local/Remote switch key | O | X | X | O | X |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

(2) compare with TECO existing inverter

| Function | | 7300PA | 7200PA | 7200GA |
|-------------------------|----------|---|---------------------------|---------------------------------|
| RS485 communication | MODBUS | PA-M (max 19200bps) | SC-M (max 9600bps) | SC-C(19200bps) SC-M(9600bps) |
| | PROFIBUS | PA-P | SC-P | SC-P |
| | others | Devicenet, Matasys N2 | X | X |
| Option card | | 1-multi PID card(PA-PID) | X | X |
| Operator | | LCD(JNEP-32) with copy LED(JNEP-33) without copy | LED(JNEP-12) without copy | LED(JNEP-12) without copy |
| Local/Remote switch key | | O | X | X |
| AO | | 2 (0~10V) | 1 | 1 |
| DI | | 8 (SINK/SOURCE) | 8 (SINK) | 8 (SINK) |
| DO | | Relay * 3, photo * 1 | Relay * 2, photo * 2 | Relay * 2, photo * 2 |
| PTC Thermistor | | O | X | X |
| Multi-step speed ref. | | 9 steps | 5 steps | 9 steps |
| Auto Energy Saving | | O | O | X |
| PID | | O | O | X |
| PID Sleep/Wake-up | | O | X | X |
| Prohibited frequency | | 3 | 1 | 3 |

(continue)

| Function | | 7300PA | 7200PA | 7200GA |
|---|----|------------------------------------|---------------------------------------|-------------------------------------|
| V/F curve | | 3 points 5 types | 2 points 15 types | 3 points 15 types |
| OL | | 110%,1min | 123%, 1min | 150%, 1min |
| Monitor Display | | Hr KWHr KW PID PF | KW PF | KW |
| Single phase protection (Input/Output) | | o | X | X |
| Memory | | Flash type(16 bit flash *1) | EPROM(27c256*2) | EPROM (27c256*2) |
| Retry function | | 10times (interval can be set) | 10 times (interval can't be set) | 10times (interval can't be set) |
| Cooling fan ON/OFF control | | o | X | X |
| Constant Group | An | 9(An-01~09) | 5 (An-01~09) | 9 (An-01~09) |
| | Bn | 24 (Bn-01~26) | 14(Bn-01~17) | 12(Bn-01~12) |
| | Cn | 59(Cn-01~63) | 54(Cn-01~60) | 42(Cn-01~42) |
| | Sn | 36(Sn-01~38) | 22(Sn-01~22) | 28(Sn-01~28) |
| | Un | 21(Un-01~21) | 11(Un-01~11) | 10(Un-01~10) |
| | On | 24 (On-01~24) | 16(On-01~16) | 12(On-01~12) |
| | Hn | 13(Hn-01~13) | X | X |

b) Dimensions (Wx Hx D)(IP00 & IP20)

| Voltage | HP | 7200GA | 7300PA | PA/GA | F7 | F7/PA | VLT6000 | VLT/PA | ACH400 | ACH/PA | ECOS | ESOC/P |
|---------|-----|----------------|--|---------------|-------------|----------------|--------------------|--------------------|--------------------|-----------------|---------------------|--------|
| 220V | 25 | 283.5x525x307 | 265x360x225(IP20) | 47% | 240x350x207 | 81 % | 308x800x296 (IP20) | 340 % | 203x662x281 (IP21) | 176 % | 275x650x285 (IP20) | 237 % |
| | 30 | | | 100 % | 250x400x258 | 56 % | | 160 % | | 70 % | | 93 % |
| | 40 | 459x790x324.6 | 283.5x525x307 (291.5x615x307) (IP20) | 39 % | 275x450x258 | 70 % | 370x800x335 | 217 % | 306x715x428 (IP21) | 70 % | 420x850x310 (IP20) | 201 % |
| | 50 | | | 39 % | 375x600x300 | 148 % | | 217 % | | 170 % | | 201 % |
| | 60 | | 344x630x324.5 (352x720x324.5) (IP20) | 60 % | 375x600x330 | 106 % | | 141 % | | 114 % | | 134 % |
| | 75 | | | 60 % | 450x725x350 | 162 % | --- | --- | 474x799x385 | 177 % | --- | --- |
| | 100 | 599x1000x381.6 | 459x790x324.6 (462x988x324.6) (IP20) | 51 % | | 97 % | | | | 98 % | | |
| | 125 | | | | 500x850x360 | 130 % | | | --- | --- | | |
| 440V | 25 | 283.5x525x307 | 265x360x225 (IP20) | 47 % | 240x350x207 | 81 % | 242x560x260 | 164 % | 203x571x248 | 134 % | 275x550x210 (IP20) | 148 % |
| | 30 | | | 47 % | 275x450x258 | 149 % | 242x700x260 (IP20) | 205 % | 203x662x281 | 176 % | | 148 % |
| | 40 | 344x630x324.5 | 283.5x525x307 (291.5x615x307) (IP20) | 65 % | | 325x550x283 | 70 % | 308x800x296 (IP20) | | 96 % | 306x715x356 | 69 % |
| | 50 | | | 65 % | 111 % | | 160 % | | 69 % | 93 % | | |
| | 60 | | 100 % | 72 % | 104 % | | 95 % | | 62 % | | | |
| | 75 | 459x790x324.6 | 344x630x324.5 (352x720x324.5) (IP20) | 60 % | 450x725x350 | 72 % | 370x800x335 | 141 % | 306x715x428 | 114 % | 420x850x310 (IP20) | 135 % |
| | 100 | | | 60 % | | 162 % | | 141 % | | 114 % | | 135 % |
| | 125 | | 100 % | 97 % | | 84 % | | 98 % | | 75 % | | |
| | 150 | 599x1000x381.6 | 459x790x324.6 (462x988x324.6) (IP20) | 51 % | 500x850x360 | 130 % | 420x1400x400 | 200 % | 474x799x385 | 98 % | 508x1480x480 (IP20) | 243 % |
| | 175 | | | 51 % | | 130 % | | --- | | --- | | --- |
| | 215 | | 100 % | 89 % | | 103 % | | 436 % | | 131 % | | |
| | 250 | 659x1233x382 | 599x1000x381.6 (602x1198x381.6) (IP20) | 74 % | | | 103 % | 830x2063x702 | 436 % | 131 % | | |
| | 300 | 824x1446x380 | | 50 % | | | 103 % | | 436 % | 131 % | | |
| | 350 | | 730x1230x382 (730x1330x382) (IP20) | | | | 1099x1896x490 | 298 % | --- | --- | 870x2230x680 (IP20) | 356 % |
| | 400 | | | | | 298 % | | 830x2063x702 | 324 % | 356 % | | |
| | 500 | | | | | 298 % | | --- | --- | --- | | |
| | | PA:GA=100:158 | | PA/F7=100:106 | | PA:VLT=100:178 | | PA:ACH400=100:174 | | PA:ECOS=100:163 | | |

c) Carry Frequency (standard)

| Voltage | HP | 7300PA(F.C) (45) | 7200GA(F.C) (45) | F7 (45) | PIIS (40) | VLT6000 (40) | ACH400 (40) | ECOS (40) |
|---------|-----|----------------------|----------------------|-------------|---------------|---|-----------------|---------------|
| 220V | 25 | 6(2-6) | 15 | 15 | | 4.5 | 4 | 4(2,4) |
| | 30 | 6 | 15 | 15 | | 4.5 | 4 | 4 |
| | 40 | 6 | 10 | 10 | | 4.5 | 4 | 4 |
| | 50 | 6 | 10 | 10 | | 4.5 | 4 | 4 |
| | 60 | 3(1-3) | 10 | 10 | | 4.5 | 3(fixed) | 4 |
| | 75 | 3 | 10 | 10 | | --- | 3 | --- |
| | 100 | 3 | 10 | 10 | | --- | 3 | --- |
| | 125 | 3 | 10 | 10 | | --- | --- | --- |
| 440V | 25 | 6 | 15 | 15 | 15 | 4.5 | 4 | 4(2,4) |
| | 30 | 6 | 15 | 15 | 15 | 4.5 | 4 | 4 |
| | 40 | 6 | 15 | 10 | 10 | 4.5 | 4 | 4 |
| | 50 | 6 | 10 | 10 | 10 | 4.5 | 4 | 4 |
| | 60 | 6 | 10 | 10 | 10 | 4.5 | 3 (fixed) | 4 |
| | 75 | 6 | 10 | 10 | 10 | 4.5 | 3 | 4 |
| | 100 | 3 | 10 | 10 | 10 | 4.5 | 3 | 4 |
| | 125 | 3 | 10 | 10 | 6 | 4.5 | 3 | 4 |
| | 150 | 3 | 10 | 10 | 6 | 4.5 | 3 | 4 |
| | 175 | 3 | 10 | 10 | 6 | --- | --- | 4 |
| | 215 | 3 | 10 | 10 | 6 | 4.5 | 3 | 4 |
| | 250 | 3 | 2 | 10 | 6 | 4.5 | 3 | 4 |
| | 300 | 2(1-2) | 2 | 2 | 6 | 4.5 | 3 | 4 |
| | 350 | 2 | | 2 | 6 | 4.5 | --- | 4 |
| | 400 | 2 | 2 | 2 | | 4.5 | 3 | 2 |
| | 500 | 2 | | | | 4.5 | --- | --- |
| | | | | | | *3~14KHz *fc >4.5KHz If derating Automatically | | |

d) Rated Current

| Voltage | HP | (Motor Rated Current) | (110%,1min) | (150%,1min) | (Yaskawa) (120%,1min) | (Fuji) (110%,1min) | (Danfoss) (110%,1min) | (ABB) (110%,1min) | (Siemens) (110%,1min) | (HUAWEI) | | |
|---------|-----|-----------------------|---------------|-------------|--------------------------|-----------------------|--------------------------|----------------------|--------------------------|----------|----------------|--------|
| | | 220V/440V60HZ | 200V/380V50HZ | 7300PA | 7200GA | F7 | E7 | P11S | VLT6000 | ACH400 | ECOS | TD2000 |
| 220V | 25 | 62 | 68.5 | 72 | 80(111%) | 71 | 74.8 | | 75 | 74.8 | 68 | |
| | 30 | 73 | 83.6 | 88 | 96(109%) | 85 | 88 | | 88 | 88 | 80 | |
| | 40 | 97.4 | 111 | 117 | 130(111%) | 115 | 115 | | 115 | 114 | 95 | |
| | 50 | 118 | 137 | 144 | 160 (111%) | 145 | 162 | | 143 | 143 | 130 | |
| | 60 | 141 | 159 | 167 | 183 (110%) | 180 | 192 | | 170 | 170 | 1548 | |
| | 75 | 176 | 202 | 212 | 224 (106%) | 215 | 312 | | --- | 211 | 71--- | |
| | 100 | 227 | 274 | 288 | 300 (104%) | 283 | 312 | | --- | 248 | 8--- | |
| | 125 | 286 | 343 | 320 | --- | 346 | 360 | | --- | --- | --- | |
| 440V | 25 | 31 | 36 | 38 | 40 | 39 | 34 | 37 | 37.5 | 38 | 37 | 32 |
| | 30 | 36 | 43 | 44 | 48 (109%) | 45 | 40 | 44 | 44 | 44 | 44 | 37 |
| | 40 | 48.7 | 58 | 59 | 64 | 60 | 67.2 | 60 | 61 | 59 | 58 | 45 |
| | 50 | 59 | 72 | 75 | 80 | 75 | 67.2 | 75 | 73 | 72 | 71 | 60 |
| | 60 | 70.5 | 83 | 86 | 96 | 91 | 77 | 91 | 90 | 77 | 84 | 75 |
| | 75 | 88 | 106 | 111 | 128 (115%) | 112 | 96 | 112 | 106 | 96 | 102 | 90 |
| | 100 | 114 | 144 | 151 | 165 | 150 | 125 | 150 | 147 | 124 | 138 | 152 |
| | 125 | 143 | 180 | 189 | 210 | 180 | 156 | 176 | 177 | 156 | 168 | 176 |
| | 150 | 175 | 220 | 231 | 224 | 216 | 180 | 210 | 212 | 180 | 193 | 210 |
| | 175 | 205 | 254 | 267 | 270 | 260 | | 253 | --- | --- | 260/4K, 293/2K | 253 |
| | 215 | 235 | 290 | 304 | 300 | 304 | 240 | 304 | 260 | 260 | 290/4K, 315/2K | 304 |
| | 250 | 305 | 357 | 340 | 340 | 370 | 304 | 377 | 315 | 316 | 340/4K, 370/2K | 380 |
| | 300 | 348 | 380 | 380 | 450 | 506 | 414 | 415 | 368 | 414 | --- | 426 |
| | 350 | 410 | 492 | 516 | --- | --- | 414 | | 480 | --- | 469/4K, 510/2K | |
| | 400 | 465 | 558 | 585 | 600 | 675 | 515 | 520 | 600(450HP) | 480 | 590 | |
| 500 | 581 | 697 | 732 | --- | --- | 675 | | 658 | --- | --- | | |

THANK YOU

END