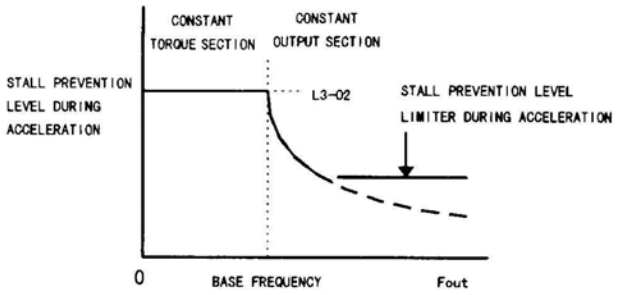
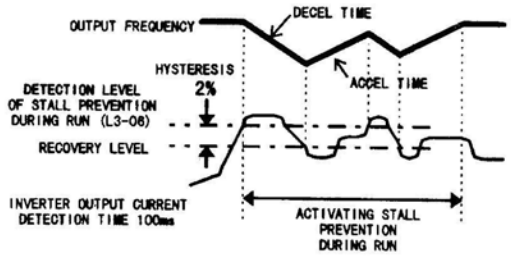
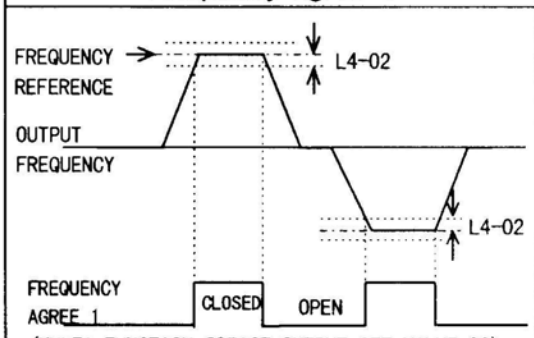
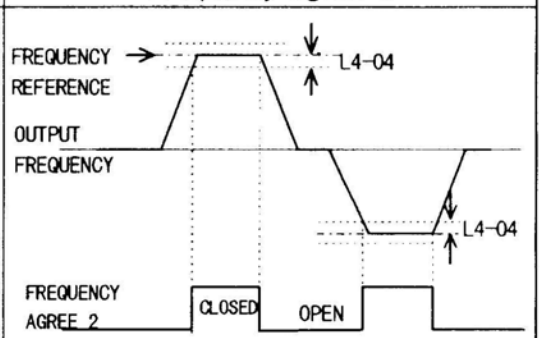
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L3-02</td><td>Stall prevention level during accel</td><td>When motor stall prevention during acceleration (L3-01=1) or optimum acceleration function (L3-01=2) is selected, the inverter adjusts the acceleration rate automatically so that motor current at acceleration will not exceed the set value.</td><td></td></tr>
<tr><td>L3-03</td><td>Stall prevention limit during accel</td><td>When a motor is used in a constant output area, the stall prevention level during acceleration is automatically reduced for smoother acceleration.
This constant is a limiting value to control the stall prevention level during acceleration in the constant output section so that it will not be reduced unnecessarily.
 
</td><td></td></tr>
<tr><td>L3-04</td><td>Stall prevention selection during decel</td><td>Sets a function to prevent inverter DC bus bar overvoltage during deceleration.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Stall prevention during deceleration disabled.
Inverter deceleration time. Excessively short deceleration time detects overvoltage fault (OV) to stop the inverter.</td></tr><tr><td>1</td><td>Stall prevention during deceleration enabled.
By monitoring DC bus bar voltage status, the deceleration rate is automatically reduced to prevent overvoltage. Deceleration time may be longer than the set value.</td></tr><tr><td>2</td><td>Optimum deceleration mode.
Deceleration rate is automatically adjusted so that the inverter can be decelerated in shortest time.</td></tr></table>
• For deceleration using a braking unit or braking resistor, set the value to 0 (stall prevention during deceleration disabled). The motor may hunt.
• Optimum deceleration function (L3-04=2) cannot be set in the vector control mode.</td><td></td></tr>
</table>

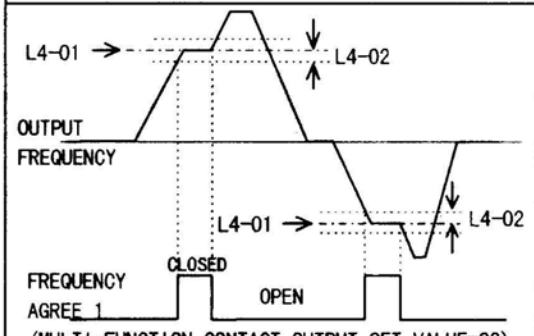
<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L3-05</td><td>Stall prevention selection during running</td><td>Sets a function to prevent motor stalling status at a overload during constant speed operation.
<table>
<tr><th>Set Value</th><th>Description</th></tr>
<tr><td>0</td><td>Stall prevention during run disabled.
A load exceeding the inverter overload capacity is applied during speed agree. The motor may continue stalling even if load is reduced.</td></tr>
<tr><td>1</td><td>Stall prevention during run enabled.
When inverter output current exceeds the value set to L3-06 and it continues more than 100ms during speed agree, output frequency is decreased (deceleration time: C1-02) to control the motor stalling. When the load returns to the normal state, acceleration restarts to continue operation at the former frequency.</td></tr>
<tr><td>2</td><td>Stall prevention during run enabled.
The basic operation is the same as that of set value 1 except that the deceleration time to decrease frequency is the value set to C1-04.</td></tr>
</table></td><td></td></tr>
<tr><td>L3-06</td><td>Stall prevention level during running</td><td>Sets the inverter output current level to start stall prevention during run (preventing the continuous stalling status by decreasing frequency).
 
</td><td></td></tr>
<tr><td>L4-01</td><td>Speed agree detection level</td><td>This constant is used to detect speed agree, etc. Output frequency to be detected is set.
This detection is performed both for FWD and REV run.</td><td>Refer to page 73.</td></tr>
<tr><td>L4-02</td><td>Speed agree detection width</td><td>Set detection width at L4-01 frequency detection.</td><td>Refer to page 73.</td></tr>
<tr><td>L4-03</td><td>Speed agree detection level (+/-)</td><td>This constant is used to detect speed agree, etc. Output frequency to be detected is set.
This detection is enabled either for FWD or REV run. (Output frequency polarity is provided at detection.)</td><td>Refer to page 73.</td></tr>
<tr><td>L4-04</td><td>Speed agree detection width (+/-)</td><td>Sets detection width at L4-03 frequency detection.</td><td>Refer to page 73.</td></tr>
</table>

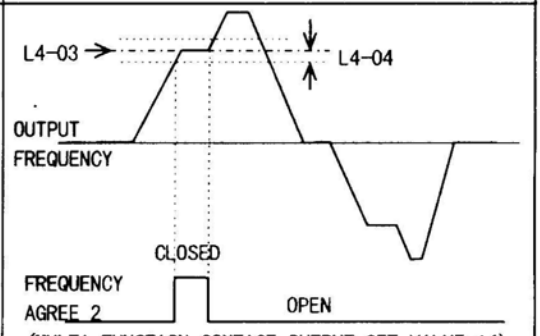
DESCRIPTION OF FREQUENCY DETECTION OPERATION

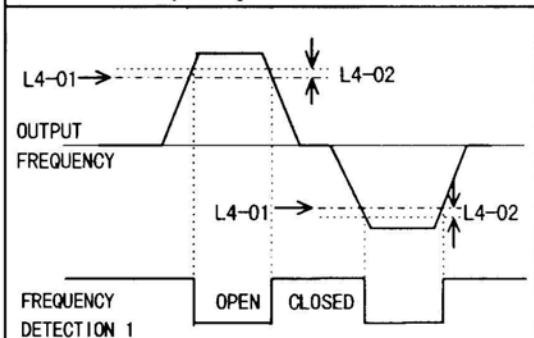
(1) When A1-02 set value is 0, 1 or 2 (control method selection is set to V/f, V/f with PG or open loop vector)

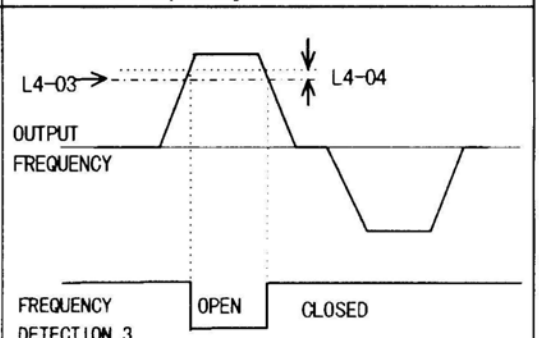
<table>
<tr><th>Related constants</th><th>L4-01 (Frequency Detection Level)
L4-02 (Frequency Detection Width)</th><th>L4-03 (Frequency Detection Level)
L4-04 (Frequency Detection Width)</th></tr>
<tr><td rowspan="2">Frequency Agree</td><td>Frequency Agree 1
 

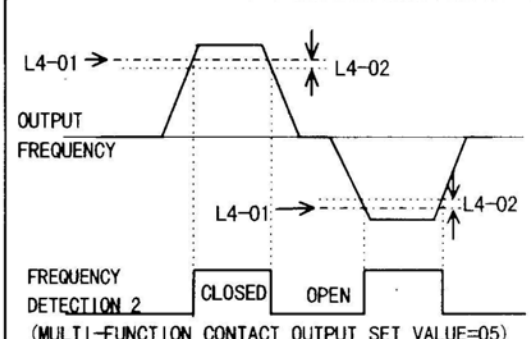
(MULTI-FUNCTION COTACT OUTPUT SET VALUE=02)</td><td>Frequency Agree 2
 

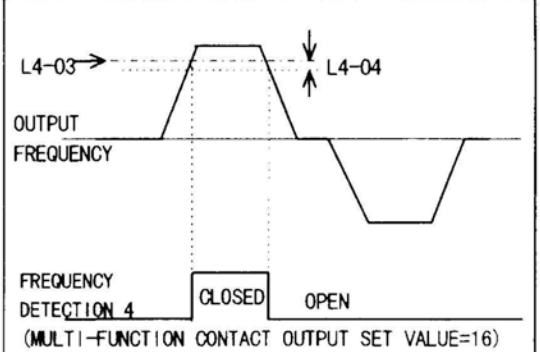
(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=13)</td></tr>
<tr><td>Desired Frequency Agree 1
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=03)</td><td>Desired Frequency Agree 2
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=14)</td></tr>
<tr><td rowspan="2">Frequency Detection</td><td>Frequency Detection 1
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=04)</td><td>Frequency Detection 3
 

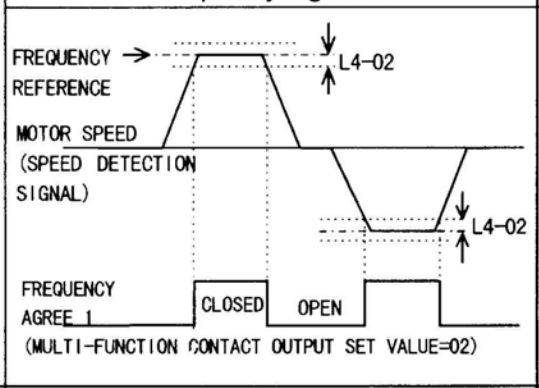
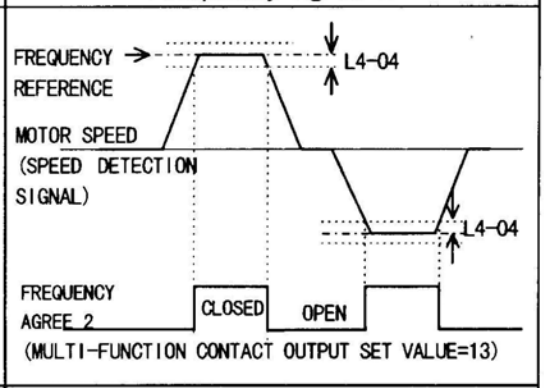
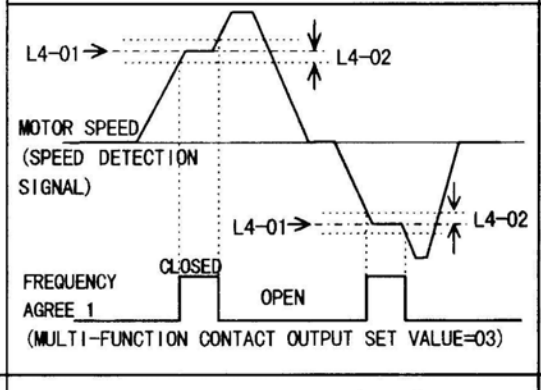
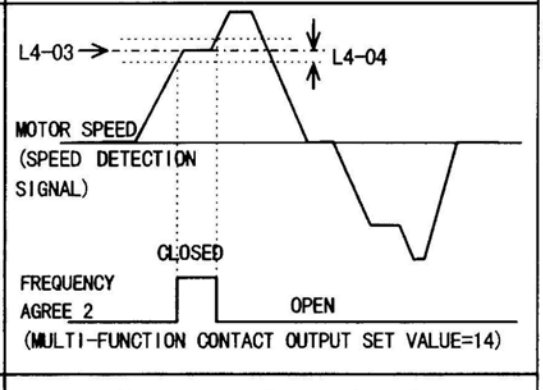
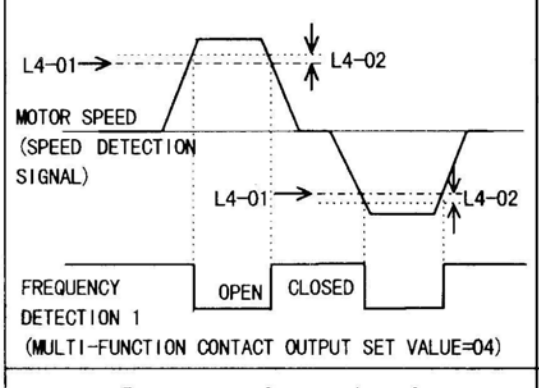
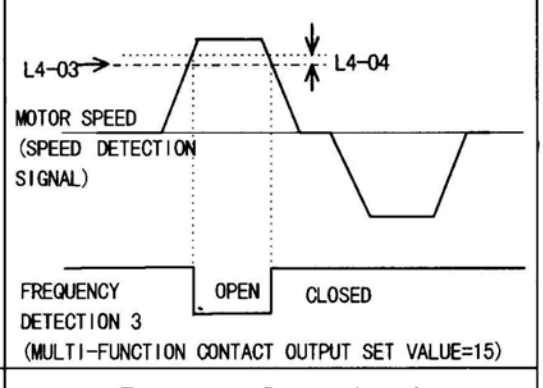
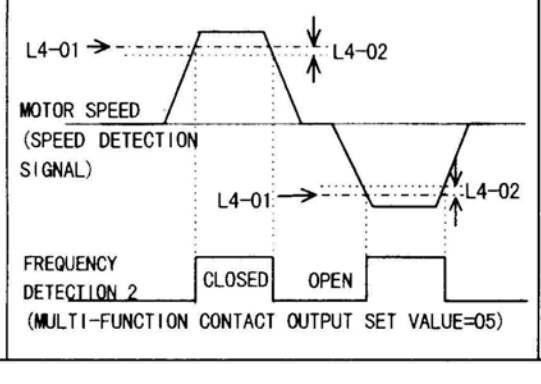
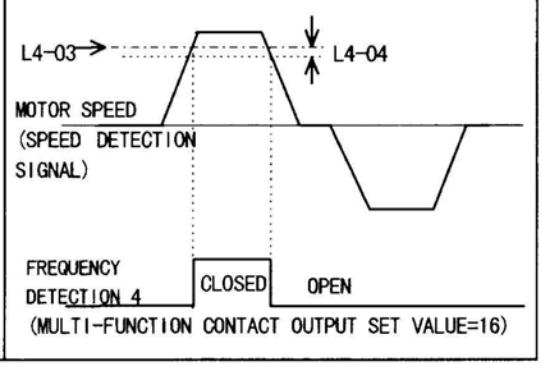
(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=15)</td></tr>
<tr><td>Frequency Detection 2
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=05)</td><td>Frequency Detection 4
 

(MULTI-FUNCTION CONTACT OUTPUT SET VALUE=16)</td></tr>
</table>

DESCRIPTION OF FREQUENCY DETECTION OPERATION

(2) When A1-02 set value is 3 (control method selection is set to flux vector)

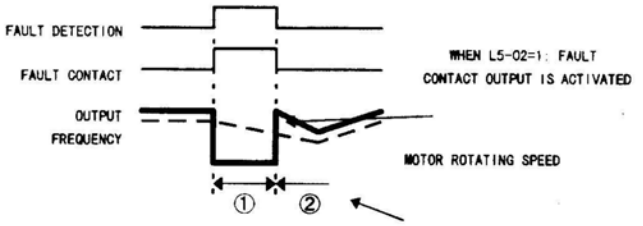
<table>
<tr><td>Related constants</td><td>L4-01 (Frequency Detection Level)
L4-02 (Frequency Detection Width)</td><td>L4-03 (Frequency Detection Level)
L4-04 (Frequency Detection Width)</td></tr>
<tr><td rowspan="2">Frequency Agree</td><td>Frequency Agree 1
 
</td><td>Frequency Agree 2
 
</td></tr>
<tr><td>Desired Frequency Agree 1
 
</td><td>Desired Frequency Agree 2
 
</td></tr>
<tr><td rowspan="2">Frequency Detection</td><td>Frequency Detection 1
 
</td><td>Frequency Detection 3
 
</td></tr>
<tr><td>Frequency Detection 2
 
</td><td>Frequency Detection 4
 
</td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L4-05</td><td>Operation when frequency reference is missing</td><td>Selects when frequency reference from the control circuit terminal is quickly reduced.

<table><tr><th>Set Value</th><th>Contents</th></tr><tr><td>0</td><td>Normal operation (Following variation of reference)</td></tr><tr><td>1</td><td>When frequency reference from control circuit terminal is reduced by 90% within 400ms, operation continues at 80% of frequency reference obtained before reduction.</td></tr></table></td><td></td></tr>
<tr><td>L5-01</td><td>Number of auto restart attempts</td><td>Fault retry is functioned to reset the fault in the inverter and restart automatically to continue operation if a fault occurs.
This constant sets the number of fault retry times.
By setting 0, fault retry operation is not performed.

Fault retry operation

① When a fault is detected, the inverter output is shut OFF for the min. baseblock time (L2-03). The digital operator displays the fault while the inverter output is shut OFF.
② When the min. baseblock time (L2-03) elapses, a fault is reset automatically and speed search operation is performed from the output frequency obtained fault occurrence.
③ When the total number of faults exceeds the number of fault retry times (L5-01), the faults are not reset automatically and the inverter output remains OFF. At this time, a fault contact output is activated.

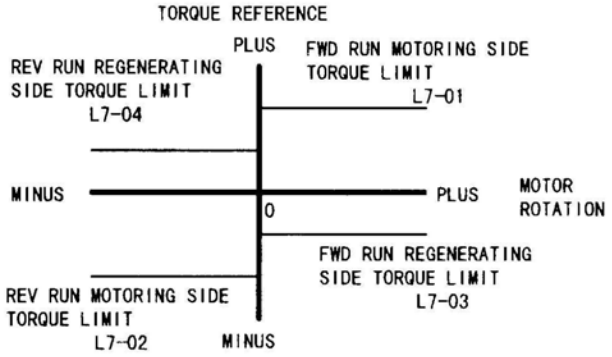
 

Clearing the number of retry times

The number of retry times is cleared to 0 in the following cases:
① A fault does not occur for more than 10 minutes.
② A fault reset signal is input from the control circuit terminal or digital operator.
③ The power supply is shut OFF and the control power supply has dissipated; and then the power supply is turned ON again.

However, fault retry is disabled for the following faults.
UV2 (Control circuit undervoltage)
UV3 (MC answer fault)
SC (Load short-circuit)
OH (Heatsink overheat)
EF (Run command fault)
OS (Over speed)
DEV (Excessive speed deviation)
PGO (PG disconnection)
OPR (Constant setting error)
CE (Transmission error)
EF3 to 8 (External fault)</td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L5-02</td><td>Auto restart operation selection</td><td>Sets whether a fault contact output is activated during fault retry.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>A fault contact output is not activated during fault retry.</td></tr><tr><td>1</td><td>A fault contact output is activated during fault retry.</td></tr></table></td><td></td></tr>
<tr><td>L6-01</td><td>Torque detection selection 1</td><td>Sets a function to detect overtorque.
Overtorque is detected according to output current value in the V/f control mode and using the inverter internal torque reference in the vector control mode.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Overtorque detection disabled (factory setting)</td></tr><tr><td>1</td><td>Overtorque detection enabled.
Overtorque detection is performed only during speed agree and “OL3” is displayed, blinking, to continue operation after detection.</td></tr><tr><td>2</td><td>Overtorque detection enabled.
Overtorque detection is performed during run and “OL3” is displayed, blinking, to continue operation after detection.</td></tr><tr><td>3</td><td>Overtorque detection enabled.
Overtorque detection is performed only during speed agree. “OL3” is displayed, lighting at overtorque detection, and a fault contact is output to shut OFF inverter output.</td></tr><tr><td>4</td><td>Overtorque detection enabled.
Overtorque detection is performed during run. “OL3” is displayed, lighting at overtorque detection, and a fault contact output is activated to shut OFF inverter output.</td></tr></table></td><td></td></tr>
<tr><td>L6-02</td><td>Torque detection level 1</td><td>Sets the overtorque detection level.
V/f control mode: Inverter rated current becomes 100%.
Vector control mode: Motor rated torque becomes 100%.</td><td></td></tr>
<tr><td>L6-03</td><td>Torque detection time 1</td><td>Overtorque is detected if the time when motor current or torque exceeds the value set to L6-02 is longer than the time set by this constant. Digital operator displays “OL3”</td><td></td></tr>
<tr><td>L6-04
L6-05
L6-06</td><td>Torque detection selection 2
Torque detection level 2
Torque detection time 2</td><td>The functions are the same as those described for constants L6-01 to L6-03. Used when two types of overtorque detection are output to multi-function outputs. Digital operator displays “OL4”</td><td></td></tr>
<tr><td>L7-01</td><td>Forward torque limit</td><td>Sets motoring side torque limit value during FWD run.</td><td>Refer to page 77.</td></tr>
<tr><td>L7-02</td><td>Reverse torque limit</td><td>Sets motoring side torque limit value during REV run.</td><td>Refer to page 77.</td></tr>
<tr><td>L7-03</td><td>Forward regenerative torque limit</td><td>Sets regenerating side torque limit value during FWD run.</td><td>Refer to page 77.</td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>L7-04</td><td>Reverse regenerative torque limit</td><td>Sets regenerating side torque limit value during REV run.
 
</td><td></td></tr>
<tr><td>L8-01</td><td>Protect selection for internal DB resistor</td><td>When a braking resistor that can be built in the inverter is used, overheat protection is enabled by using this function. (Overheat is detected at operating duty 3% of braking resistor.)
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Braking resistor overheat protection disabled</td></tr><tr><td>1</td><td>Braking resistor overheat protection enabled</td></tr></table></td><td></td></tr>
<tr><td>L8-02</td><td>OH pre-alarm level</td><td>Sets the heatsink temperature to predict heatsink overheat.</td><td></td></tr>
<tr><td>L8-03</td><td>Operation selection after OH pre-alarm</td><td>Selects the operation mode when the inverter detects heatsink overheat prediction.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Deceleration to stop at value set to C1-02</td></tr><tr><td>1</td><td>Inverter output OFF (Coasting to stop)</td></tr><tr><td>2</td><td>Deceleration to stop at value set to C1-09 (Quick deceleration to stop)</td></tr><tr><td>3</td><td>Continuous operation</td></tr></table></td><td></td></tr>
<tr><td>L8-05</td><td>Input open-phase protection selection</td><td>IF power supply open-phase, excessive power supply voltage imbalance or main circuit electrolytic capacitor deterioration occurs, excessive inverter DC bus bar ripple voltage is detected to stop the inverter.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Excessive ripple detection disabled</td></tr><tr><td>1</td><td>Excessive ripple detection enabled</td></tr></table></td><td></td></tr>
<tr><td>L8-07</td><td>Output open-phase protection selection</td><td>A function to detect inverter output open-phase.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Inverter output open-phase detection disabled</td></tr><tr><td>1</td><td>Inverter output open-phase detection enabled</td></tr></table>Output open-phase may be detected inadvertently when applied motor capacity is small for inverter capacity, etc.</td><td></td></tr>
</table>

O DIGITAL OPERATOR-RELATED CONSTANTS

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>01-01</td><td>Monitor selection</td><td>4 items can be monitored in operation. This constant can select an item to be monitored instead of output voltage. Set 01-01 to □□ in monitor constant U1-□□.</td><td></td></tr>
<tr><td>01-02</td><td>Monitor selection after power up</td><td>Set an item to be monitored immediately after the power supply is turned ON. Digital operator displays the item set by this constant after the power supply is turned ON.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>Displays frequency reference.</td></tr><tr><td>2</td><td>Displays output frequency.</td></tr><tr><td>3</td><td>Displays output current.</td></tr><tr><td>4</td><td>Displays a monitor item selected by 01-01.</td></tr></table></td><td></td></tr>
<tr><td>01-03</td><td>Frequency units of reference setting and monitor</td><td>Units for frequency related reference or monitor can be selected as shown below.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Unit: 0.01Hz</td></tr><tr><td>1</td><td>Unit: 0.01%</td></tr><tr><td>2 to 39</td><td>Unit: r/min (0 to 3999)
r/min=120×frequency reference(Hz)/01-03 (01-03: Number of motor poles)
(Effective except when in flux vector control)</td></tr><tr><td>40 to 3999</td><td>Decimal point position set with 5th digit value of 01-03.
5th digit value=0: Displayed as □□□□
5th digit value=1: Displayed as □□□.□
5th digit value=2: Displayed as □□.□□
5th digit value=3: Displayed as □.□□□
01-03 1st to 4th digits determine the set value of 100% frequency.
(Example 1)
Assuming that 100% frequency set value is 200.0 set 01-03=12000.
When 01-03=12000 is set, 100% frequency is displayed as 200.0 and 60% speed is displayed as 120.0.
(Example 2)
Assuming that 100% frequency set value is 65.00, set 01-03=26500.
When 01-03=26500 is set, 60% frequency is displayed as 39.00.</td></tr></table></td><td></td></tr>
<tr><td>01-04</td><td>Frequency units of constant setting</td><td>V/f related constant (E1-04, 06, 07 and 09) setting unit can be changed to r/min.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Setting monitor unit: Hz</td></tr><tr><td>1</td><td>Setting monitor unit: rpm</td></tr></table></td><td></td></tr>
<tr><td>01-05</td><td>Constant No. display selection</td><td>How to display operator constant No. can be selected.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Normal display (A1-00, etc.)</td></tr><tr><td>1</td><td>Displays constant No. specified by MODBUS communication (address).</td></tr></table></td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>02-01</td><td>LOCAL / REMOTE key enable/disable</td><td>Sets digital operator LOCAL / REMOTE key enabled/disabled.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Digital operator REMOTE/LOCAL key disabled.</td></tr><tr><td>1</td><td>Digital operator REMOTE/LOCAL key enabled.
Priority of frequency reference and run command is alternated with priority set by digital operator and B1-01/02.</td></tr></table></td><td></td></tr>
<tr><td>02-02</td><td>STOP key during control circuit terminal operation</td><td>Sets digital operator STOP key enabled/disabled in the run mode.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Digital operator STOP key disabled.
Digital operator STOP key is disabled during run by run command other than that given from the digital operator.</td></tr><tr><td>1</td><td>Digital operator STOP key enabled.
Digital operator STOP key is enabled even during run by run command other than that given from the digital operator.</td></tr></table>When the set value is "1 (factory setting)" and operation is stopped by a STOP command other than that given from the digital operator, it is necessary to turn OFF the RUN command once.</td><td></td></tr>
<tr><td>02-03</td><td>User constant initial value</td><td>Constants set by user can be stored in the inverter as user initial values.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>1</td><td>User constant initial value setting.
Each constant obtained when 02-03=1 is set, is stored as a constant initial value. Even if each constant setting is changed after setting this constant, it can be returned to the user constant initial value by setting A1-03=1110 (initialization to user initial value).</td></tr><tr><td>2</td><td>Clearing user constant initial value.
Clears the user constant initial values that are set as above.</td></tr></table>After setting the value, the indication on the digital operator shows "Entry accepted" then resets to "0"</td><td></td></tr>
<tr><td>02-04</td><td>kVA selection</td><td>Sets inverter capacity. By this constant setting, control constants peculiar to the inverter can be set automatically.</td><td></td></tr>
<tr><td>02-05</td><td>Frequency reference setting method selection</td><td>Whether ENTER key operation is needed can be set when frequency reference is set by digital operator.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Digital operator ENTER key needed.
To set frequency reference by digital operator, the inverter accepts frequency reference at the time when the digital operator ENTER key is depressed.</td></tr><tr><td>1</td><td>Digital operator ENTER key not needed.
Inverter accepts frequency reference displayed on the digital operator frequency reference without ENTER key operation.</td></tr></table></td><td></td></tr>
</table>

<table>
<tr><th>Constant No.</th><th>Name</th><th>Description</th><th>Remarks</th></tr>
<tr><td>02-06</td><td>Operation selection when digital operator is disconnected</td><td>When running by digital operator, inverter operation selection at communication fault occurrence between the digital operator and the inverter (cable disconnection, removal of digital operator, etc.) is set.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>Operation is continued</td></tr><tr><td>1</td><td>Coasting to a stop and an error message "OPR" is indicated on a digital operator</td></tr></table></td><td></td></tr>
<tr><td>02-07</td><td>Cumulative operation time setting</td><td>Sets an initial value of cumulative operation time. Accumulation of operation time starts from this set value.</td><td></td></tr>
<tr><td>02-08</td><td>Cumulative operation time selection</td><td>Defines the operation time.
<table><tr><th>Set Value</th><th>Description</th></tr><tr><td>0</td><td>All time while the inverter power supply is turned ON is accumulated as operation time.</td></tr><tr><td>1</td><td>Only the time while the inverter is running is accumulated as operation time.</td></tr></table></td><td></td></tr>
</table>

ERiC DRiVE®

TRANSISTORIZED INVERTER

AC MOTOR SPEED CONTROLLER

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