

**Analog Input / Output Interface Card
"OPC-AIO"**

Product Specifications

**Design Dept. Suzuka Factory
Drive Division
Power Electronics Business Group**

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1. Overview

This product is an optional analog input/output interface card to be mounted on the FRENIC-HVAC/AQUA/Ace series of inverters. It has the following terminals.

- Analog voltage input : one point (0 to +/-10 V)
- Analog current input : one point (4 to 20 mA or 0 to 20mA)
- Analog voltage output : one point (0 to +/-10 V)
- Analog current output : one point (4 to 20 mA)

2. Specifications

2.1 Connection Ports

FRENIC-HVAC/AQUA

The interface card can be connected to any one of the three option connection ports (A-, B- and C-ports) on the inverter. However it is not allowed to be mounted with OPC-AO at the same time.

FRENIC-Ace

The interface card can be connected to the one option connection port of the dedicated adapter for installation.

2.2 Applicable ROM version

The table below lists the inverter's ROM version to which the interface card is applicable.

Series	Type	Capacity	ROM version
FRENIC-HVAC/AQUA	FRN□□□AR1□-4□/ FRN□□□AQ1□-4□	All capacities	1300 or later
FRENIC-Ace	FRN□□□E2□-2□/ FRN□□□E2□-4□	All capacities	0300 or later

*A box (□) replaces alphanumeric letters depending on the inverter capacity, enclosure and delivery destination, etc.

2.3 Operating Environment

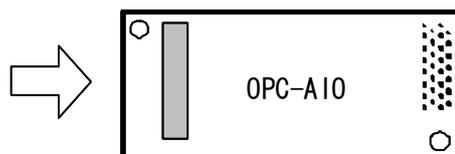
The table below lists the environmental requirements for the inverter equipped with the interface card.

Items	Specifications
Location	Indoors
Ambient temperature	Refer to the inverter's product specifications.
Relative humidity	5 to 95 % (without condensation)
Atmosphere	The inverter must not be exposed to dust, direct sunlight, corrosive gases, flammable gases, oil mist, vapor or water drops. (Pollution degree 2 (IEC 60664-1)) The atmosphere can contain a small amount of salt. (0.01mg/cm ² or less per year) The inverter must not be subjected to sudden changes in temperature that will cause condensation.
Altitude	Max. 1,000 m

3. Terminal Functions

3.1 Terminal Allocation

The figure below shows the terminal allocation viewed from the direction of the arrow.

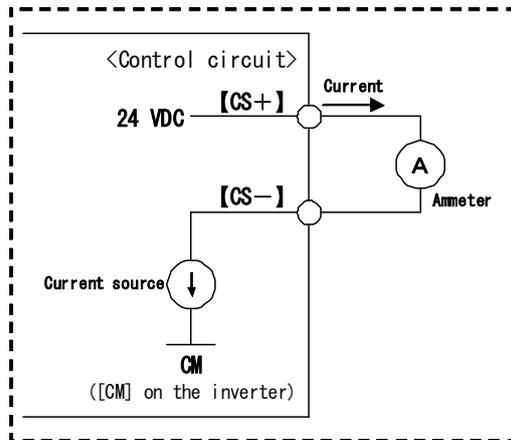


CS+	CS-	Ao+	Ao-	C2	P10	32	31
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3.2 Details of the Terminal Functions

The table below lists the terminal symbols, names and functions of the terminals on the interface card.

Classifications	Symbols	Name	Functions	Remarks
Analog Input	[P10]	Power supply for the potentiometer	Power supply for frequency command potentiometer (Variable resistor : 1 to 5k ohms) (DC 10 V, DC 10 mA max.)	
	[32]	Analog voltage input	<ul style="list-style-type: none"> Used as frequency setting voltage input. DC 0 to +/- 10 V / 0 to +/- 100% (0 to +/- 5 V / 0 to +/- 100%) One of the items of [12] for the inverter can be issued. Resolution : 1/3000 	Input impedance : 22 k ohms Maximum input : +/- 15 VDC
	[C2]	Analog current input	<ul style="list-style-type: none"> Used as frequency setting current input. DC 4 to 20 mA / 0 to 100% or DC 0 to 20 mA / 0 to 100% One of the items of [12] for the inverter can be issued. Resolution : 1/3000 	Input impedance : 250 ohms Maximum input : 30 mA DC
	[31]	Analog common	Reference terminal for frequency setting signal [P10], [32] and [C2].	Same potential as terminal [11] (on the inverter).
Analog Output	[Ao+]	Analog voltage output +	<ul style="list-style-type: none"> Outputs the monitor signal of analog DC voltage (0 to +/- 10 VDC). One of the items of [FM1] or [FM2] for the inverter can be issued and can be output the PID deviation of polarity. Resolution : 1/3000 	It is capable of driving up to two analog voltmeters with 10 k ohms impedance.
	[Ao-]	Analog voltage output -	Reference terminal for analog voltage output [Ao+].	Same potential as terminal [11] (on the inverter).
	[CS+]	Analog current output +	<ul style="list-style-type: none"> Outputs the monitor signal of analog DC current (DC 4 to 20 mA). One of the items of [FM1] or [FM2] for the inverter can be issued. Resolution : 1/3000 	Isolated from terminals [31], [Ao-], and [11] (on the inverter). A measuring device with a maximum of 500 ohms can be connected.
	[CS-]	Analog current output -		



3.3 Terminal Specifications

The table below lists the terminal specifications.

Items	Specifications
Applicable wire size	AWG18 to AWG24 (0.25 to 0.75 mm ²)
Screw size	M2
Tightening torque	0.22 to 0.25 N·m

(Note) Depending upon the wire type and / or the number of wires used, the front cover of the inverter may be lifted by the wires, which impedes normal keypad operation. If it happens, change the wire type or size.

3.4 Connection Example

The table below shows the connection examples of the terminals.

Terminal name	Connection example
[32]	<p>Shielded wire</p> <p>Potentiometer 1 to 5 k ohms</p> <p>[P10] [32] [31]</p>
[C2]	<p>Shielded wire</p> <p>Constant current source 4 to 20 mA or 0 to 20 mA</p> <p>[C2] [31]</p>
[Ao]	<p>Shielded wire</p> <p>[Ao+] [Ao-]</p> <p>V</p>
[CS]	<p>Shielded wire</p> <p>[CS+] [CS-]</p> <p>A</p>

4. Configuration of Function Codes

4.1 List of Function Codes

The tables below lists the function codes prepared for the interface card.

Terminal [32]

Function codes	Name	Data	Function
o60	(Mode selection)	0 to 49(HVAC/AQUA)	Same as E61, E62 and E63.
		0 to 20(Ace)	
o61	(Offset adjustment)	-5.0 to +5.0%	Offset adjustment amount
o62	(Gain adjustment)	0.00 to 200.00%	Gain adjustment amount
o63	(Filter setting)	0.00 to 5.00s	Filter constant
o64	(Gain base point)	0.00 to 100.00%	Gain base point
o65	(Polarity)	0	Bipolar
		1	Unipolar
o66	(Bias)	-100.00 to 100.00%	Bias value
o67	(Bias base point)	0.00 to 100.00%	Bias base point
o69	(Display unit)	1 to 80	Same as J105.
o70	(Maximum scale)	-999 to 0.00 to 9990	Maximum scale
o71	(Minimum scale)	-999 to 0.00 to 9990	Minimum scale

Terminal [C2]

Function codes	Name	Data	Function
o75	(Current range selection)	0	4 to 20 mA Unipolar
		1	0 to 20 mA Unipolar
		10(Ace)	4 to 20 mA Bipolar
		11(Ace)	0 to 20 mA Bipolar
o76	(Mode selection)	0 to 49(HVAC/AQUA)	Same as E61, E62 and E63.
		0 to 20(Ace)	
o77	(Offset adjustment)	-5.0 to +5.0%	Offset adjustment amount
o78	(Gain adjustment)	0.00 to 200.00%	Gain adjustment amount
o79	(Filter setting)	0.00 to 5.00s	Filter constant
o81	(Gain base point)	0.00 to 100.00%	Gain base point
o82	(Bias)	-100.00 to 100.00%	Bias value
o83	(Gain base point)	0.00 to 100.00%	Gain base point
o85	(Display unit)	1 to 80	Same as J105.
o86	(Maximum scale)	-999 to 0.00 to 9990	Maximum scale
o87	(Minimum scale)	-999 to 0.00 to 9990	Minimum scale

Terminal [Ao]

Function codes	Name	Data	Function
o90	(Mode selection)	0 to 117 (HVAC/AQUA)	Same as F31 and F35.
		0 to 120 (Ace)	
o91	(Gain adjustment)	0 to 300%	Gain adjustment amount
o93	(Polarity)	0	Bipolar
		1	Unipolar

Terminal [CS]

Function codes	Name	Data	Function
o96	(Mode selection)	0 to 117 (HVAC/AQUA)	Same as F31 and F35.
		0 to 120 (Ace)	
o97	(Gain adjustment)	0 to 300%	Gain adjustment amount

4.2 Function Code Details

The tables below lists the details the function codes configuration.

Analog Input Functions ([32], [C2])

FRENIC-HVAC/AQUA

Data for o60, o76	Function	Descriptions
0	None	-
1	Auxiliary frequency command 1	Auxiliary frequency input to be added to the reference frequency given by frequency command 1 (F01). Will not be added to any other reference frequency given by frequency command 2 and multistep frequency commands, etc.
2	Auxiliary frequency command 2	Auxiliary frequency input to be added to all reference frequencies given by frequency command 1, frequency command 2, multistep frequency commands, etc.
3	PID process command 1	Inputs command sources such as temperature and pressure under PID control 1 or 2. Function code setting also required: J102/202 = 1
4	PID process command 2	Inputs the second command sources under PID control 1 or 2. Function code setting also required: J102/202 = 1
5	PID feedback value 1	Inputs feedback amounts such as temperature and pressure under PID control 1 or 2.
12	Acceleration / deceleration time ratio setting	To be used for making ratio setting by analog input to acceleration/ deceleration time.
13	Upper limit frequency	To be used for limiting the output frequency by analog input.
14	Lower limit frequency	
20	Analog signal input monitor	By inputting analog signals from various sensors such as the temperature sensors in air conditioners to the inverter, you can monitor the state of external devices via the communications link. By using an appropriate display coefficient, you can also have various values to be converted into physical quantities such as temperature and pressure before they are displayed.
30	PID feedback value 2	Inputs the 2nd feedback amounts under PID control 1 or 2.
31	Auxiliary input 1 to PID process command	Auxiliary analog input to be added to the process command under PID control 1 or 2.
32	Auxiliary input 2 to PID process command	2nd auxiliary analog input to be added to the process command under PID control 1 or 2.
33	Flow sensor	Input from the flow sensor.
41	External PID process command 1	Inputs command sources such as temperature and pressure under external PID control 1, 2 or 3. Function code setting also required: J502/J602/J652
42	External PID feedback value 1	Inputs feedback amounts such as temperature and pressure under external PID control 1, 2 or 3.
43	External PID manual command 1	To be used for setting PID output (MV) manually when external PID control 1 is canceled.
44	External PID process command 2	Inputs the 2nd command sources such as temperature and pressure under external PID control 2 or 3. Function code setting also required: J602/J652
45	External PID feedback value 2	Inputs the 2nd feedback amounts such as temperature and pressure under external PID control 2 or 3. Under external PID control 1, external PID feedback value 1 and addition, difference, average, maximum and minimum can be calculated.
46	External PID manual command 2	To be used for setting PID output (MV) manually when external PID control 2 is canceled.
47	External PID process command 3	Inputs the 3rd command sources such as temperature and pressure under external PID control 3. Function code setting also required: J652
48	External PID feedback value 3	Inputs the 3rd feedback amounts such as temperature and pressure under external PID control 3.
49	External PID manual command 3	To be used for setting PID output (MV) manually when external PID control 3 is canceled.

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Data for o60, o76	Function	Descriptions
0	None	-
1	Auxiliary frequency command 1	Auxiliary frequency input to be added to the reference frequency given by frequency command 1 (F01). Will not be added to any other reference frequency given by frequency command 2 and multistep frequency commands, etc.
2	Auxiliary frequency command 2	Auxiliary frequency input to be added to all reference frequencies given by frequency command 1, frequency command 2, multistep frequency commands, etc.
3	PID process command 1	Inputs command sources such as temperature and pressure under PID control.
5	PID feedback value 1	Inputs feedback amounts such as temperature and pressure under PID control.
6	Gain setting	Use as gain for the frequency command.
7	Torque limit value A	Use as analog torque limit value
8	Torque limit value B	
9	Torque bias amount	Used as analog torque bias command value.
10	Torque command	Used as analog torque command value / Torque current command value.
11	Torque current command	
17	Speed limit value of FWD	Used as analog speed limit value of FWD/REV.
18	Speed limit value of REV	
20	Analog signal input monitor	By inputting analog signals from various sensors such as the temperature sensors in air conditioners to the inverter, you can monitor the state of external devices via the communications link. By using an appropriate display coefficient, you can also have various values to be converted into physical quantities such as temperature and pressure before they are displayed.

Analog Output Functions ([Ao])
 FRENIC-HVAC/AQUA

Data for o90	Candidate for a monitor	Function	Meter scale (Full scale at 100%)
0	Output frequency 1 (before slip compensation)	Output frequency of the inverter (Equivalent to the motor synchronous speed)	Maximum frequency (F03)
1	Output frequency 2 (after slip compensation)	Output frequency of the inverter	Maximum frequency (F03)
2	Output current	Output current (RMS) of the inverter	Twice the inverter rated current
3	Output voltage	Output voltage (RMS) of the inverter	500 V
4	Output torque	Motor shaft torque	Twice the rated motor torque
5	Load factor	Load factor (Equivalent to the indication of the load meter)	Twice the rated motor load
6	Input power	Input power of the inverter	Twice the rated output of the inverter
7	PID feedback amount	Feedback amount under PID control	100% of the feedback amount
9	DC link bus voltage	DC link bus voltage of the inverter	1,000 V
10	Universal AO	Command via communications link	20,000 as 100%
13	Motor output	Motor output (kW)	Twice the rated motor output
14	Calibration (+)	Full scale output for the meter calibration	This always outputs the full-scale (100%).
15	PID command (SV)	Command value under PID control	100% of the feedback amount
16	PID output (MV)	Output level of the PID processor under PID control (Frequency command)	Maximum frequency (F03)
18	Heat sink temperature	Heat sink temperature inside the inverter unit	200 °C
20	Reference frequency	Frequency command input to the inverter	Maximum frequency (F03)
50	PID feedback amount 1 (PV1)	Feedback amount under PID control 1	100% of the feedback amount
51	PID command 1 (SV1)	Command value under PID control 1	100% of the feedback amount
52	PID control 1 deviation (ERR1)	Deviation 1 under PID control (SV1-PV1) ^{*1}	100% of the feedback amount
53	PID control final deviation (ERR)	Final deviation under PID control (ERR1, ERR2) ^{*2}	100% of the feedback amount
54	PID feedback amount 2 (PV2)	Feedback amount under PID control 2	100% of the feedback amount
55	PID command 2 (SV2)	Command value under PID control 2	100% of the feedback amount
56	PID control 2 deviation (ERR2)	Deviation 2 under PID control (SV2-PV2) ^{*1}	100% of the feedback amount
60	External PID feedback amount 1 (EPID1-PV)	Feedback amount under external PID control 1	100% of the feedback amount
61	External PID command 1 (EPID1-SV)	Command value under external PID control 1	100% of the feedback amount
62	External PID control 1 deviation (EPID1-ERR)	Deviation under external PID control 1 ^{*1}	100% of the feedback amount
63	External PID control 1 final deviation (EPID1-ERR)	Final deviation under external PID control 1 ^{*2}	100% of the feedback amount
65	External PID final output 1 (EPID1-OUT)	Final output under external PID control 1	100% of the feedback amount
70	External PID feedback amount 2 (EPID2-PV)	Feedback amount under external PID control 2	100% of the feedback amount
71	External PID command 2 (EPID2-SV)	Command value under external PID control 2	100% of the feedback amount
72	External PID control 2 deviation (EPID2-ERR)	Deviation under external PID control 2 ^{*1}	100% of the feedback amount
75	External PID final output 2 (EPID2-OUT)	Final output under external PID control 2	100% of the feedback amount
80	External PID feedback amount 3 (EPID3-PV)	Feedback amount under external PID control 3	100% of the feedback amount
81	External PID command 3 (EPID3-SV)	Command value under external PID control 3	100% of the feedback amount
82	External PID control 3 deviation (EPID3-ERR)	Deviation under external PID control 3 ^{*1}	100% of the feedback amount
85	External PID final output 3 (EPID3-OUT)	Final output under external PID control 3	100% of the feedback amount
111	Customizable logic output signal 1	—	100% of the logic output amount
112	Customizable logic output signal 2	—	100% of the logic output amount
113	Customizable logic output signal 3	—	100% of the logic output amount
114	Customizable logic output signal 4	—	100% of the logic output amount
115	Customizable logic output signal 5	—	100% of the logic output amount
116	Customizable logic output signal 6	—	100% of the logic output amount
117	Customizable logic output signal 7	—	100% of the logic output amount

*1 : Before select Deviation selection and Mode selection.

*2 : After select Deviation selection and Mode selection.

FRENIC-Ace

Data for o90	Candidate for a monitor	Function	Meter scale (Full scale at 100%)
0	Output frequency 1 (before slip compensation)	Output frequency of the inverter (Equivalent to the motor synchronous speed)	Maximum frequency (F03)
1	Output frequency 2 (after slip compensation)	Output frequency of the inverter	Maximum frequency (F03)
2	Output current	Output current (RMS) of the inverter	Twice the inverter rated current
3	Output voltage	Output voltage (RMS) of the inverter	500 V
4	Output torque	Motor shaft torque	Twice the rated motor torque
5	Load factor	Load factor (Equivalent to the indication of the load meter)	Twice the rated motor load
6	Input power	Input power of the inverter	Twice the rated output of the inverter
7	PID feedback amount	Feedback amount under PID control	100% of the feedback amount
8	Actual speed / Estimated speed	Actual speed detected through the PG interface, or estimated speed	Maximum frequency (F03)
9	DC link bus voltage	DC link bus voltage of the inverter	1,000 V
10	Universal AO	Command via communications link	20,000 as 100%
13	Motor output	Motor output (kW)	Twice the rated motor output
14	Calibration (+)	Full scale output for the meter calibration	This always outputs the full-scale (100%).
15	PID command (SV)	Command value under PID control	100% of the feedback amount
16	PID output (MV)	Output level of the PID processor under PID control (Frequency command)	Maximum frequency (F03)
17	Position deviation in synchronous operation	Deviation in angle	0% to 50% to 100%, representing -180° to 0° to +180° of the deviation
18	Heat sink temperature	Heat sink temperature inside the inverter unit	200 °C
21	PG feedback value	Speed detected through the PG interface	Maximum frequency (F03)
111	Customizable logic output signal 1	—	100% of the logic output amount
112	Customizable logic output signal 2	—	100% of the logic output amount
113	Customizable logic output signal 3	—	100% of the logic output amount
114	Customizable logic output signal 4	—	100% of the logic output amount
115	Customizable logic output signal 5	—	100% of the logic output amount
116	Customizable logic output signal 6	—	100% of the logic output amount
117	Customizable logic output signal 7	—	100% of the logic output amount
118	Customizable logic output signal 8	—	100% of the logic output amount
119	Customizable logic output signal 9	—	100% of the logic output amount
120	Customizable logic output signal 10	—	100% of the logic output amount

Analog Output Functions ([CS])
 FRENIC-HVAC/AQUA

Data for o96	Candidate for a monitor	Function	Meter scale (Full scale at 100%)
0	Output frequency 1 (before slip compensation)	Output frequency of the inverter (Equivalent to the motor synchronous speed)	Maximum frequency (F03)
1	Output frequency 2 (after slip compensation)	Output frequency of the inverter	Maximum frequency (F03)
2	Output current	Output current (RMS) of the inverter	Twice the inverter rated current
3	Output voltage	Output voltage (RMS) of the inverter	500 V
4	Output torque	Motor shaft torque	Twice the rated motor torque
5	Load factor	Load factor (Equivalent to the indication of the load meter)	Twice the rated motor load
6	Input power	Input power of the inverter	Twice the rated output of the inverter
7	PID feedback amount	Feedback amount under PID control	100% of the feedback amount
9	DC link bus voltage	DC link bus voltage of the inverter	1,000 V
10	Universal AO	Command via communications link	20,000 as 100%
13	Motor output	Motor output (kW)	Twice the rated motor output
14	Calibration (+)	Full scale output for the meter calibration	This always outputs the full-scale (100%).
15	PID command (SV)	Command value under PID control	100% of the feedback amount
16	PID output (MV)	Output level of the PID processor under PID control (Frequency command)	Maximum frequency (F03)
18	Heat sink temperature	Heat sink temperature inside the inverter unit	200 °C
20	Reference frequency	Frequency command input to the inverter	Maximum frequency (F03)
50	PID feedback amount 1 (PV1)	Feedback amount under PID control 1	100% of the feedback amount
51	PID command 1 (SV1)	Command value under PID control 1	100% of the feedback amount
52	PID control 1 deviation (ERR1)	Unusable function code with [CS].	
53	PID control final deviation (ERR)		
54	PID feedback amount 2 (PV2)	Feedback amount under PID control 2	100% of the feedback amount
55	PID command 2 (SV2)	Command value under PID control 2	100% of the feedback amount
56	PID control 2 deviation (ERR2)	Unusable function code with [CS].	
60	External PID feedback amount 1 (EPID1-PV)	Feedback amount under external PID control 1	100% of the feedback amount
61	External PID command 1 (EPID1-SV)	Command value under external PID control 1	100% of the feedback amount
62	External PID control 1 deviation (EPID1-ERR)	Unusable function code with [CS].	
63	External PID control 1 final deviation (EPID1-ERR)		
65	External PID final output 1 (EPID1-OUT)	Final output under external PID control 1	100% of the feedback amount
70	External PID feedback amount 2 (EPID2-PV)	Feedback amount under external PID control 2	100% of the feedback amount
71	External PID command 2 (EPID2-SV)	Command value under external PID control 2	100% of the feedback amount
72	External PID control 2 deviation (EPID2-ERR)	Unusable function code with [CS].	
75	External PID final output 2 (EPID2-OUT)	Final output under external PID control 2	100% of the feedback amount
80	External PID feedback amount 3 (EPID3-PV)	Feedback amount under external PID control 3	100% of the feedback amount
81	External PID command 3 (EPID3-SV)	Command value under external PID control 3	100% of the feedback amount
82	External PID control 3 deviation (EPID3-ERR)	Unusable function code with [CS].	
85	External PID final output 3 (EPID3-OUT)	Final output under external PID control 3	100% of the feedback amount
111	Customizable logic output signal 1	—	100% of the logic output amount
112	Customizable logic output signal 2	—	100% of the logic output amount
113	Customizable logic output signal 3	—	100% of the logic output amount
114	Customizable logic output signal 4	—	100% of the logic output amount
115	Customizable logic output signal 5	—	100% of the logic output amount
116	Customizable logic output signal 6	—	100% of the logic output amount
117	Customizable logic output signal 7	—	100% of the logic output amount

Functions that can be assigned are subject to addition or change due to updating. Refer to the “Instruction Manual” and “User's Manual” of the inverter.

FRENIC-Ace

Data for o96	Candidate for a monitor	Function	Meter scale (Full scale at 100%)
0	Output frequency 1 (before slip compensation)	Output frequency of the inverter (Equivalent to the motor synchronous speed)	Maximum frequency (F03)
1	Output frequency 2 (after slip compensation)	Output frequency of the inverter	Maximum frequency (F03)
2	Output current	Output current (RMS) of the inverter	Twice the inverter rated current
3	Output voltage	Output voltage (RMS) of the inverter	500 V
4	Output torque	Motor shaft torque	Twice the rated motor torque
5	Load factor	Load factor (Equivalent to the indication of the load meter)	Twice the rated motor load
6	Input power	Input power of the inverter	Twice the rated output of the inverter
7	PID feedback amount	Feedback amount under PID control	100% of the feedback amount
8	Actual speed / Estimated speed	Actual speed detected through the PG interface card or estimated speed	Maximum frequency (F03)
9	DC link bus voltage	DC link bus voltage of the inverter	1,000 V
10	Universal AO	Command via communications link	20,000 as 100%
13	Motor output	Motor output (kW)	Twice the rated motor output
14	Calibration (+)	Full scale output for the meter calibration	This always outputs the full-scale (100%).
15	PID command (SV)	Command value under PID control	100% of the feedback amount
16	PID output (MV)	Output level of the PID processor under PID control (Frequency command)	Maximum frequency (F03)
17	Position deviation in synchronous operation	Deviation in angle	0% to 50% to 100%, representing -180° to 0° to +180° of the deviation
18	Heat sink temperature	Heat sink temperature inside the inverter unit	200 °C
21	PG feedback value	Speed detected through the PG interface card	Maximum frequency (F03)
111	Customizable logic output signal 1	—	100% of the logic output amount
112	Customizable logic output signal 2	—	100% of the logic output amount
113	Customizable logic output signal 3	—	100% of the logic output amount
114	Customizable logic output signal 4	—	100% of the logic output amount
115	Customizable logic output signal 5	—	100% of the logic output amount
116	Customizable logic output signal 6	—	100% of the logic output amount
117	Customizable logic output signal 7	—	100% of the logic output amount
118	Customizable logic output signal 8	—	100% of the logic output amount
119	Customizable logic output signal 9	—	100% of the logic output amount
120	Customizable logic output signal 10	—	100% of the logic output amount

5. Revisions

Rev.	Contents	Date	Drawn	Checked	Approved
-	First edition	Aug./27/2012	H.Kono	E.Iwabuchi	E.Iwabuchi
a	Second edition -Corresponds to FRENIC Ace/Edge series -Corrects "Meter scale" of the customizable logic output signals.	Jul./10/2013	T.Migaki	S.Higuchi	N.Itoigawa
b	Third edition -Delete FRENIC-Edge series -Add item 116 to 120 of function code o90/o96.	Oct./10/2013	T.Migaki	S. Higuchi	N. Itoigawa