

# ***TOSVERT VF-AS3***

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Trace function Instruction Manual

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## 1. Introduction

VF-AS3 has trace function which is useful to investigate the cause of trip (protective action).

The trace function retains the data at trip and at trigger input, then the trace data can be read out until reset the trip or turning off the power.

Up to 4 types of data can be selected from approximately 60, and 100 consecutive points can be stored as trace data.

The timing to retain the trace data is the following.

At trip: Data before the trip occurs

At trigger input: Data after trigger signal inputs

RS485 communication and Trace tool (software): PCT003Z with PC are used to read out the trace data for VF-AS3.

\*1: Please contact your Toshiba distributor for Trace tool: PCT003Z.

\*2: USB communication conversion unit (optional), USB cable (optional) and commercially available USB cable (A-B connection type) to connect to the PC are necessary.

Refer to VF-AS3 Trace tool Instruction Manual for usage and connection.

PCT003Z cannot be used for the trace function of VF-AS1 and VF-PS1.

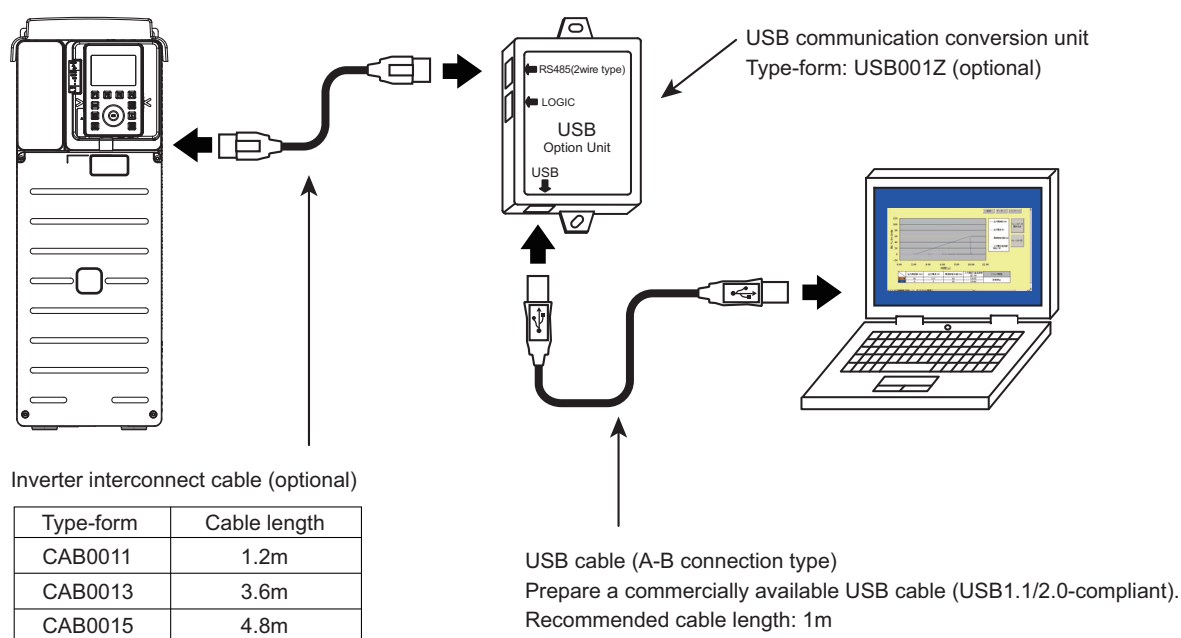


Fig. 1 Example of connection between inverter and PC

## 2. Setting

### ■ Parameter setting

Title	Parameter name	Adjustment range	Default setting
F740	Trace	0: Disabled 1: At trip 2: At trigger input 3: At trip & at trigger input	1
F741	Trace cycle	0: 4ms 1: 20ms 2: 100ms 3: 1s 4: 10s	2
F742	Trace data 1	0-162	0
F743	Trace data 2	0-162	1
F744	Trace data 3	0-162	2
F745	Trace data 4	0-162	3

Note 1) When you set [F303: Retry], the data at first trip is retained. The trace data is cleared at retry success.

#### [F742] to [F745] setting

Set value	Communication No.	Trace data (Monitor data)	Communication unit at trace
0	FD00	Output frequency	0.01Hz
1	FD02	Frequency command value	0.01Hz
2	FD03	Output current	0.01%
3	FD04	Input voltage (DC detection)	0.01%
4	FD05	Output voltage	0.01%
5	FD15	Stator frequency	0.01Hz
6	FD16	Speed feedback frequency (real time)	0.01Hz
7	FD17	Speed feedback frequency (1-second filter)	0.01Hz
8	FD18	Torque	0.01%
9	FD19	Torque command	0.01%
10	FD99	Output frequency during run. Frequency command value during stop.	-
11	FD20	Torque current	0.01%
12	FD21	Exciting current	0.01%
13	FD22	PID feedback value	0.01Hz
14	FD23	Motor overload factor (OL2 data)	0.01%
15	FD24	Inverter overload factor (OL1 data)	0.01%
16	FD25	Braking resistor overload factor (OLr data)	1%
17	FD28	Braking resistor load factor (%ED)	1%
18	FD29	Input power	0.01kW
19	FD30	Output power	0.01kW

[F742] to [F745] setting

Set value	Communication No.	Trace data (Monitor data)	Communication unit at trace
20	FE76	Input cumulative power	[F749] setting
21	FE77	Output cumulative power	[F749] setting
24	FE35	Terminal RR input value	0.01%
25	FE36	Terminal RX input value	0.01%
26	FE37	Terminal II input value	0.01%
27	FD94	Motor speed command	-
34	FD26	Motor load factor	1%
35	FD27	Inverter load factor	1%
62	FD48	PID result frequency	0.01Hz
63	FD58	PID set value	0.01Hz
64	FD50	Light-load high-speed switching load torque	0.01%
65	FD51	Light-load high-speed torque during constant speed run	0.01%
71	FD90	Motor speed (estimated value)	1
76	FE56	Terminal S4/S5 pulse train input value	0.01%
79	FD87	Dancer control PID result frequency	0.01Hz
120	FD83	Internal temperature 1	-
124	FE78	Power circuit board temperature	-
130	FD96	External PID3 set value	-
131	FD97	External PID3 feedback value	-
132	FD98	External PID3 result value	-
133	FE96	External PID4 set value	-
134	FE97	External PID4 feedback value	-
135	FE98	External PID4 result value	-
150	FD00	Signed output frequency	0.01Hz
151	FD02	Signed frequency command value	0.01Hz
152	FD15	Signed stator frequency	0.01Hz
153	FD16	Signed speed feedback frequency (real time)	0.01Hz
154	FD17	Signed speed feedback frequency (1-second filter)	0.01Hz
155	FD18	Signed torque	0.01%
156	FD19	Signed torque command	0.01%
158	FD20	Signed torque current	0.01%
159	FD22	Signed PID feedback value	0.01Hz
160	FE37	Signed terminal RX input value	0.01%
161	FE38	Signed terminal AI4 input value	0.01%
162	FE39	Signed terminal AI5 input value	0.01%

## ■ Trigger signal input

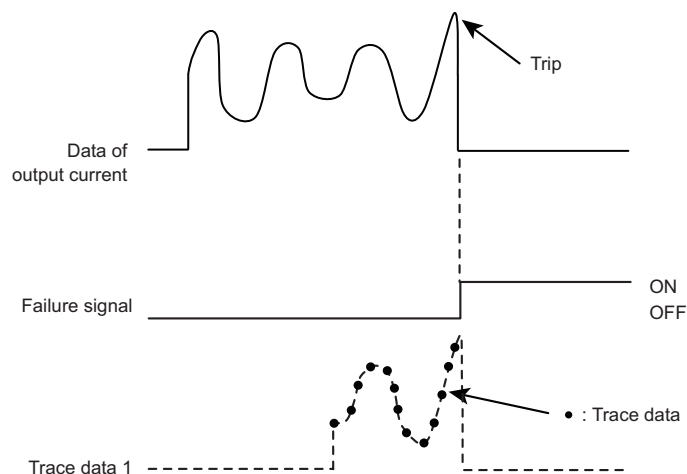
Trigger signal is input to the input terminal. Assign "76: Trace trigger" to an unused input terminal.

- The trace data is overwritten each time a trigger signal is input.
- When [F740] = "3: At trip & at trigger input" setting  
If the inverter trips when no trigger signal is input, the trace data is overwritten with tripping data.

## ■ Retaining of the trace data

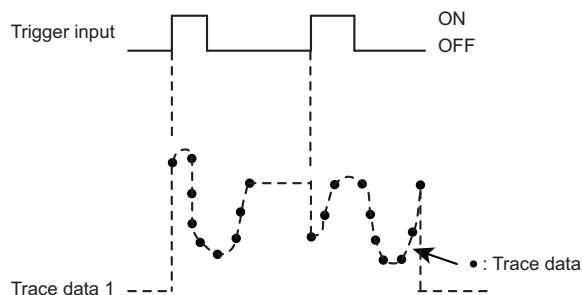
### 1) Retaining of the trace data until trip occurs: [F740] = "1" or "3"

Examples of output current date

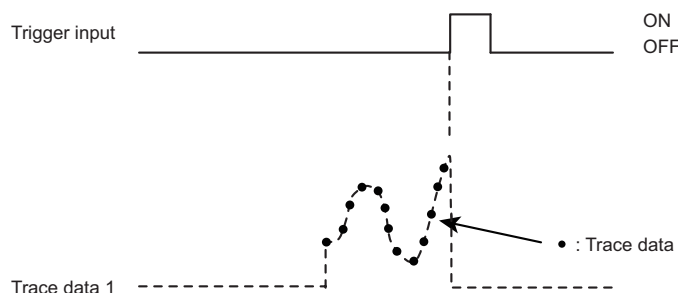


\* In case of trigger input when setting [F740] = "3", operation is that described in 3).

### 2) Retaining of the trace data at trigger input: [F740] = "2"



### 3) Retaining of the trace data until trigger input: [F740] = "3"



\* In case of trip when setting [F740] = "3", operation is that described in 1).

## ■ Readout the trace data

RS485 communication and Trace tool: PCT003Z with PC are used to read out the trace data.

### 1) Trace data communication number

The following is the communication number to read out the trace data.

Communication No.	Function	Minimum unit (setting/readout)	Setting/readout range	Default setting
E000	Trace data 1 to 4 pointer	1/1	0 to 99	0
E100	Data 1 of trace data 1	1/1	0 to FFFF	0
E101 to E198	Data 2 to 99 of trace data 1	1/1	0 to FFFF	0
E199	Data 100 of trace data 1	1/1	0 to FFFF	0
E200	Data 1 of trace data 2	1/1	0 to FFFF	0
E201 to E298	Data 2 to 99 of trace data 2	1/1	0 to FFFF	0
E299	Data 100 of trace data 2	1/1	0 to FFFF	0
E300	Data 1 of trace data 3	1/1	0 to FFFF	0
E301 to E398	Data 2 to 99 of trace data 3	1/1	0 to FFFF	0
E399	Data 100 of trace data 3	1/1	0 to FFFF	0
E400	Data 1 of trace data 4	1/1	0 to FFFF	0
E401 to E498	Data 2 to 99 of trace data 4	1/1	0 to FFFF	0
E499	Data 100 of trace data 4	1/1	0 to FFFF	0

e.g. When reading out the output frequency.

Readout data (1F40) h = 8000  $\Rightarrow$  8000  $\times$  0.01Hz = 80.0Hz

### 2) Relationship between pointer and the trace data

The table below shows the relationship between pointer (E000 set value) and trace data 1 to 4.

Pointer (E000 set value)	0	1	2	to	98	99
Trace data 1 (E100 to E199)	E100	E101	E102	to	E198	E199
Trace data 2 (E200 to E299)	E200	E201	E202	to	E298	E299
Trace data 3 (E300 to E399)	E300	E301	E302	to	E398	E399
Trace data 4 (E400 to E499)	E400	E401	E402	to	E498	E499

e.g. When E000 = "2"

(Oldest data)

(Latest data)

Trace data 1 E102 to E199, E100, E101

Trace data 2 E202 to E299, E200, E201

Trace data 3 E302 to E399, E300, E301

Trace data 4 E402 to E499, E400, E401

- Set Trace data (1 to 4) to the parameters [F742] to [F745].
- E000 is automatically incremented by the inverter when data is traced continuously.  
In ordinary cases, you don't need to change the set value.