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TOSVERT VF-S15

Trace function Instruction Manual

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1. Introduction

VF-S15 has trace function to retain the data at tripping and at triggering and to read out such data until resetting the tripped inverter or turning off the power.
Up to 4 types of data can be selected from approximately 25, and 100 consecutive points can be stored as trace data, which is useful for determining the cause.

RS485 communication and the software for trace function, PCT002Z-E, are used for VF-S15. Use PC to read data.

*1: Please contact your Toshiba distributor for the software:PCT002Z-E.

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

Refer to the Trace tool PCT002Z-E Instruction Manual (E6581857) for usage and connection. PCT002Z-E cannot be used for trace function of VF-AS1 and VF-PS1.
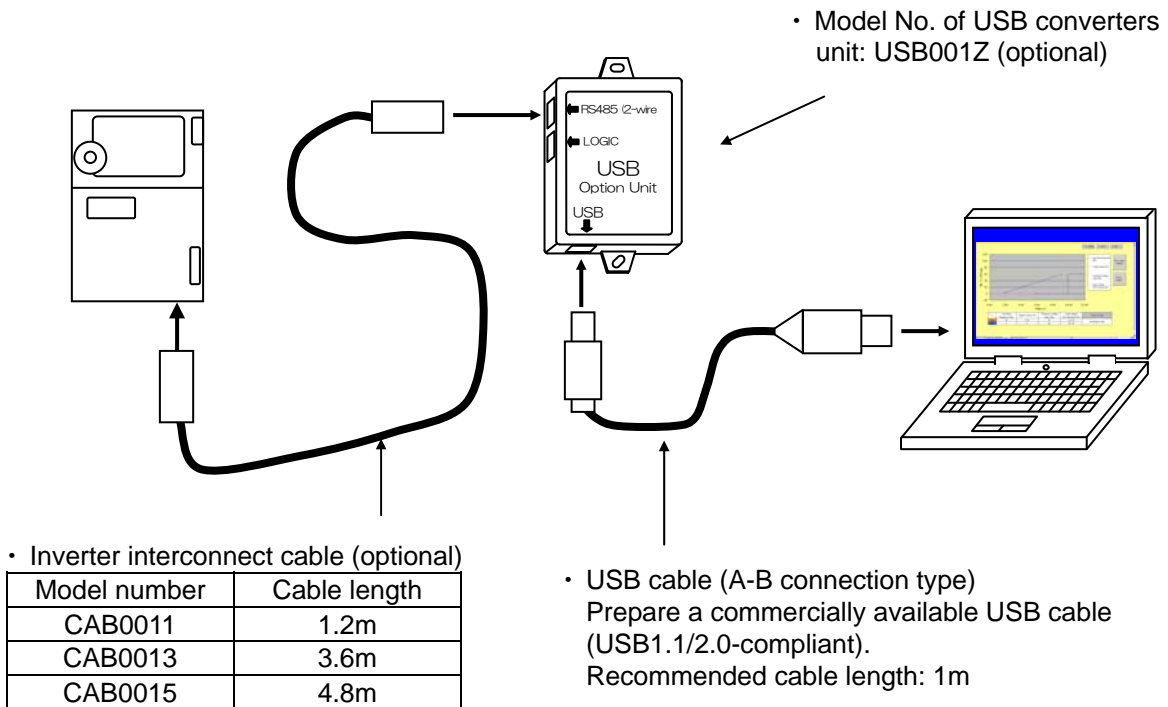

・ Model No. of USB converters unit: USB001Z (optional)

・ Inverter interconnect cable (optional)

Model number	Cable length
CAB0011	1.2m
CAB0013	3.6m
CAB0015	4.8m

・ USB cable (A-B connection type)
Prepare a commercially available USB cable (USB1.1/2.0-compliant).
Recommended cable length: 1m

Fig. 1 An example of connection of USB converters unit

2. Trace function

VF-S15 retains the data collected at the time of tripping or triggering and reads out such data until resetting the tripped inverter or turning off the power.
Up to 4 types of data can be selected from approximately 25, and 100 consecutive points can be stored as trace data.
As the data including change of current at tripping can be read out, these trace data is useful for determining the cause of trip and triggering.

Here is the time at which trace data is acquired.
  Tripping   : Data collected before the trip occurs
  Triggering: Data collected after triggering

Use RS485 communication and the software for trace function, PCT002Z-E.
Use PC to read data.

2.1 Related parameters

Title	Function	Adjustment range	Default setting
$F740$	Trace selection	0: Disabled 1: At tripping 2: At triggering 3: 1+2	1
$F741$	Trace cycle	0: 4ms 1: 20ms 2: 100ms 3: 1s 4: 10s	2
$F742$	Trace data 1	0-42	0
$F743$	Trace data 2	0-42	1
$F744$	Trace data 3	0-42	2
$F745$	Trace data 4	0-42	3

Note1: For saving trace data, do not disconnect power supply after inverter tripped. If the power is disconnected, trace data will be deleted.

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[Setup values of $F742$ to $F745$]

Default setting	Communication No.	Trace (monitor) function	Communication unit at tracing
0	FD00	Output frequency (Hz/free unit)	0.01Hz
1	FD03	Output current (%/A)	0.01%
2	FD02	Frequency command value (Hz/ free unit)	0.01Hz
3	FD04	Input voltage (DC detection) (%/V)	0.01%
4	FD05	Output voltage (command value) (%/V)	0.01%
5	FD29	Input power (kW)	0.01kW
6	FD30	Output power (kW)	0.01kW
7	FD18	Torque (%)	0.01%
9	FD23	Motor cumulative load factor (%)	0.01%
10	FD24	Inverter cumulative load factor (%)	0.01%
11	FD25	PBR (Braking resistor) cumulative load factor (%)	0.01%
12	FD15	Motor primary frequency (Hz/ free unit)	0.01Hz
13	FE35	VIA input value (%)	0.01%
14	FE36	VIB input value (%)	0.01%
18	FA51	Arbitrary code from communication	-
20	FE37	VIC input value (%)	0.01%
21	FE56	Pulse train input value (pps)	1pps
23	FD22	PID feedback value (Hz/ free unit)	0.01Hz
24	FE76	Input power	According to $F749$
25	FE77	Output power	
26	FE26	Motor load factor (%)	1%
27	FE27	Drive load factor (%)	1%
40	FD06	Input terminal status	-
41	FD07	Output terminal status	-
42	FD01	Inverter status	-

Ex.) When using the S3 terminal as the tracing back trigger signal terminal

Title	Function	Adjustment range	Example of setting
$F116$	Input terminal function selection 6 (S3)	0-203	76: Trace back trigger signal

Setting value 77 is reverse signal.

Note 1: If the inverter trips when no trigger signal is given, trace data is overwritten with tripping data.
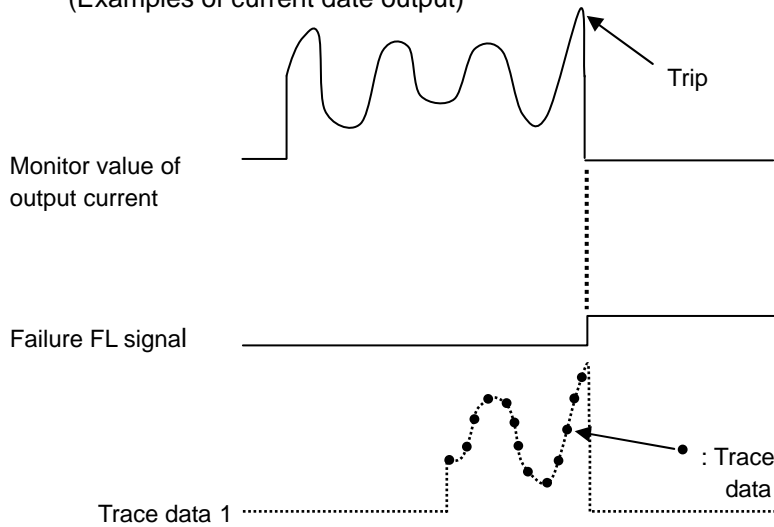Note 2: Trace data is overwritten each time a trigger signal is given.
Note 3: When retry operation is occurred, the data at first tripping is written. The trace data is cleared at retry success.
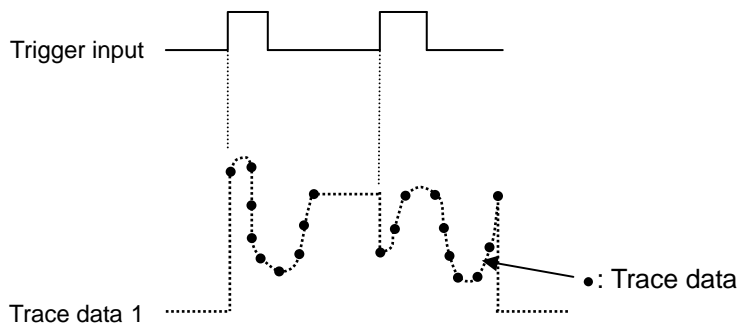
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2.2 Acquisition of trace data

2.2.1 Example of acquisition of trace data

1) To acquire trace data until the occurrence of tripping: $F740 = 1, 3$
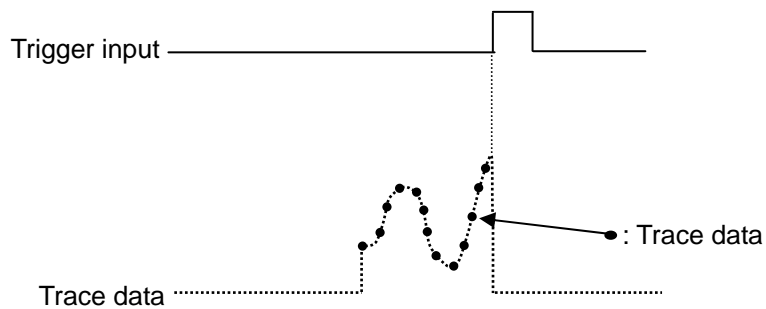(Examples of current date output)

Monitor value of
output current

Trip

Failure FL signal

● : Trace
data

Trace data 1

* In case of trigger input when setting $F740 = 3$, operation is that described in 3).

2) To acquire trace data at the time of triggering: $F740 = 2$

Trigger input

Trace data 1

●: Trace data

3) To acquire trace data until the time of triggering: $F740 = 3$

Trigger input

Trace data

●: Trace data

* In case of tripping when setting $F740 = 3$, operation is that described in 1).

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2.2.2 How to acquire the trace data

Use RS485 communication and the software for trace function, PCT002Z-E to acquire trace data.

■ Trace data communication number

Communication No.	Function	Minimum setting /readout unit	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
	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
	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
	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
	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

Ex) When operation frequency data is acquired through a communication device
Data acquired (1F40) h=8000 ⇒ 8000×0.01Hz=80.0Hz

■ Relationship between pointer and 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	–	98	99
Trace data 1 (E100 to E199)	E100	E101	E102	–	E198	E199
Trace data 2 (E200 to E299)	E200	E201	E202	–	E298	E299
Trace data 3 (E300 to E399)	E300	E301	E302	–	E398	E399
Trace data 4 (E400 to E499)	E400	E401	E402	–	E498	E499

<Example of setting> If E000 is set to 2:

```
              (Earliest 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
```

Note 1: Use the parameters F742 through to F745 to specify the types of trace data (1 to 4).

Note 2: Communication numbers E000 is automatically incremented by the inverter when data is traced continuously.

* In ordinary cases, these parameters do not need to be rewritten.