System Overview

infiSYS RV-200 system is a permanently-installed vibration analysis system designed for large rotating equipment with journal bearings and for small rotating equipment with roller-element bearings. It has a vibration monitoring function based on ISO7919-3 and ISO10816-3 and a graph drawing function required by a certified engineers in ISO18436-2 standard for vibration analysis, and provides a variety vibration monitoring and analysis function.

This sytem is made up of monitors and analyzers which converts vibration waveform, detected by transducers, to digital signals and infiSYS View Station which aquires/saves provided vibration analysis data and displays analysis results.

infiSYS RV-200 SYSTEM SOFTWARE PRODUCT

Product Name	Specifications No.
VM-773B infiSYS Analysis View	6H14-118
VM-774B infiSYS Remote View	6H14-120
VM-781B infiSYS Diagnostic Software	6H14-122
VM-772B Device Config	6H14-116
VM-783B infiSYS Report Software	6H14-124
VM-784B infiSYS OPC Client Software	6H14-126

infiSYS RV-200 SYSTEM HARDWARE PRODUCT

Product Name	Specifications No.
DAQpod DP-2000 infiSYS Data Acquisition Unit	6H14-239
DAQpod AP-2000 infiSYS Data Acquisition Unit	6H14-241 6H14-243
VM-7B Monitor (VM-701B/ALY, VM-702B/ALY, etc.)	6H14-026 6H14-032
VM-7 Monitor (VM-731, VM-732)	6H14-074 6H14-076

infiSYS RV-200 TERMINAL NAME

In this system, the combination of the software and the PC in which the software is installed is called as follows.

Combination	Name
VM-773B + PC	infiSYS View Station
VM-774B + PC	infiSYS Remote Station

System Specifications

CONFIGURATION

Devices connected : Max. 20 units[1]
Supported devices : VM-7B Monitor, VM-7 Monitor,
DAQpod DP-2000 infiSYS Data Acquisition Unit,
DAQpod AP-2000 infiSYS Data Acquisition Unit,
Modbus equipment
Database size : Max. 2TB
Measurement point : Max. 480 points[2]
Redundant communication
: Analysis communication with VM-7B[3] monitor can be made redundant.

[1] DP-2000H is composed of 2 systems, therefore counted as two units in this calculation.
[2] Actual number of points measurable may be limited due to system configuration.
For the sizes of data used for this system, refer to "DATA SIZES OF infiSYS RV-200 SYSTEM (FOR REFERENCE ONLY)" in the following page.
[3] VM-742B Network Communication Modules with analysis software communication function must be installed in both the Slot C1 and 2.

ANALYSIS DATA[4]

In this system, analysis data provided changes depending on the channel type and analysis mode ("Critical" or "BOP").

Trend data of vibration channel[4] (Static Data)

Data Provided by Analysis Software	DAQpod (Critical)	DAQpod (BOP)	VM-7B	VM-7
GAP[6]	O	O	O	O
Overall	O	O	O	O
Rotation Speed	O	O[5]	O	O
1X Amplitude, 2X Amplitude, 0.5X Amplitude, Not-1X Amplitude	O	O	O	O
1X Phase, 2X Phase, 0.5X Phase[6]	O	-	O	O
S(p-p)max[6]	O	-	O	-
nX1 Amplitude, nX2 Amplitude, nX3 Amplitude, nX4 Amplitude, fX1 Amplitude, fX2 Amplitude	O	O	O	-
nX1 Phase, nX2 Phase, nX3 Phase, nX4 Phase[6]	O	-	O	-
Inner Race, Outer Race, Ball Spin, <8XΣ	-	O	-	-

Trend data of Process channel (Static Data)

Data Provided by Analysis Software	DAQpod	VM-7B	VM-7
Displacement, Rotor Speed, Rotor Acceleration, Eccentricity, etc.	O	O	O
Temperature(Direct)	O	O	O
Temperature(Composite, Differential)	-	O	-

Waveform data of vibration channel (Dynamic Data)

Data Provided by Analysis Software	DAQpod (Critical)	DAQpod (BOP)	VM-7B	VM-7
Synchronous Waveform[7]	O	-	O	O
Asynchronous Waveform[7]	O	O	O	O

[4] Vibration data of trend data is calculated based on synchronous waveform under Critical mode; asynchronous waveform under BOP mode.
[5] Provided with phase marker signals input.
[6] GAP, Phase and S(p-p)max is only available during displacement vibration measurement.
[7] The number of sampling points of waveform data is 2.56 times the number of frequency analysis lines.
DAQpod DP-2000, AP-2000 : 400/800/1600.
VM-7B Monitor, VM-7 Monitor : 800

SHORT TERM / LONG TERM DATA SAVING FEATURES

Short Term Data

Saving interval
Vibration channel

		DAQpod (Critical)	DAQpod (BOP)	VM-7B	VM-7
Trend data		1sec	10sec	1sec	1sec
Waveform data	normal interval (for constant rotation speed),	1min[9]	1 min[9]	1 min[10]	1 min[9]
	short interval (for varying rotation speed)[8]	10sec[9]	—	10sec[9]	10sec[9]

Process channel

	DAQpod	VM-7B	VM-7
Trend data	1sec	1sec	10sec

Saving Period[11]
Trend data : 1 to 31 days
Waveform data : 1 to 31 days

[8] varying rotation speed : a condition where speed changes by 10 rpm or more.
[9] The saving interval can be changed to 10 seconds / 20 seconds / 30 seconds / 1 minute / 2 minutes / 3 minutes / 5 minutes / 10 minutes.
Depending on the number of measurement points and system requirements, the intervals that can actually be stored are limited.
[10] The saving interval can be changed to 1 seconds / 2 seconds / 10 seconds / 20 seconds / 30 seconds / 1 minute / 2 minutes / 3 minutes / 5 minutes / 10 minutes.
In order to acquire at 1 second / 2 seconds interval, it is necessary to use VM-742B/WD1.
If you set 1 or 2 seconds for the normal interval, you can not specify the short interval.
[11] Saving period for trend data, waveform data can be set separately.

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System Specifications

Long Term Data

Data saved : Instantaneous, largest, smallest and mean values in trend data, waveform data

Saving interval
 Trend data : 10 min / 20 min / 60 min / 120 min
 Waveform data : 1hour / 2hour / 6hour / 8hour / 12hour / 24hour

Saving Period
 Trend data : 1 yr / 2yrs / 3 yrs / 4 yrs / 5 yrs
 Waveform data : Settings of trend data is shared

ALARM FUNCTION

	Alarm type	DAQpod (Critical)	DAQpod (BOP)	VM-7B	VM-7
Vibration channel	Overall alarm	O	O	O	O
	Overall variation alarm[*1]	—	O	—	—
	Vector alarm(1X、2X)	O	—	O	O
	Vector variation alarm[*2]	O	—	O	O
	Spectrum alarm (Alarm for each band)	—	O	—	—

	Alarm type	DAQpod	VM-7B	VM-7
Phase marker	Rotation speed alarm	O	O	O
Process channel	Process alarm	O	O	O
	Process alarm(Composite)	—	O	—
	Process alarm(Differential)	—	O	—

*1 Can be used when the unit is mm / s rms.
*2 Can be used when the unit is μm p-p.

ALARM DATA SAVING FEATURE

When an alarm event occurs, data before and after the alarm, are saved. The data of the nearest period are saved in a shorter, device specific interval. (Applicable to critical mode only.) (Critical mode of some devices only)

Saving interval(Designated period before and after alarm occurre)
 : Complies with the setting of short term data saving interval

Saving interval(Designated period before and after alarm occurre [*3])

	DAQpod (Critical)	DAQpod (BOP)	VM-7B	VM-7
Trend data	0.1sec	—	0.1sec	—
Waveform data	10sec[*4]	—	10sec[*4]	10sec[*4]

Saving period
 Trend data : 1 hour/ 3hour /8hour/ 24 hour before and after the alarm
 Waveform data : 1 hour/ 3hour /8hour/ 24 hour before and after the alarm

*3 For trend data, it will be 20 seconds before alarm and 10 seconds after alarm.
 In the case of waveform data, the maximum length is 60 seconds before the alarm, 60 seconds after the alarm (varies depending on the alarm generation condition)
 However, if the Saving interval (short interval) is set to 60 seconds or more, it follows the Saving interval.
*4 Complies with the setting of short term data saving interval (high speed).
 If you set 1 second or 2 seconds for the collection normal interval, you can not set the collection short interval because it is always high speed.

TRANSIENT DATA SAVING FEATURE

Data during transient period (startup/shutdown) is saved. Waveform data is saved in the time (⊿t) or rotation speed (⊿rpm) interval specified beforehand.
Saving interval(Vibration channel only)[*5]
 Trend data : 1 sec (Critical mode), 10 sec (BOP mode)
 Waveform data : Complies with setting of ⊿t[*6] or ⊿rpm[*7].

Saving period (Trend, Waveform)
 Startup period :
  Time when reached the starting speed – m min to
  Time when reached the end speed + n min
  (m:0 to 6 0min, n:0 to 180 min)
  (E.g : 100 rpm to 2,950rpm + for 20 min)
 Shutdown period :
  Time when reached the starting speed – m min to
  Time when reached the end speed + m min
  (E.g: 2,950rpm to 100rpm)

*5 During transient period, alarm determination process is disabled.
*6 ⊿t can be set to any number between 1 and 600 sec (in 1 sec interval).
 In the case of less than 10 seconds interval, it is necessary to use VM-742B/WD1.
*7 ⊿rpm can be set to any number between 1 and 1,000 rpm (in 1 rpm interval).
 (Minimum of 10 seconds interval)

NUMBER OF HISTORY ITEMS

Transient history per measurement point : 100 to 1,000 items
Alarm history per measurement point : 100 to 1,000 items
Number of event histories per device : 1,000 to 10,000 items

ANALYSIS GRAPH

The analysis graph that can be displayed changes for each type of device and channel in this system.

ANALYSIS GRAPH	DAQpod Vibration Critical	DAQpod Vibration BOP	DAQpod Process	VM-7B / VM-7 Vibration	VM-7B / VM-7 Process
Trend Plot	O	O	O	O	O
Long Term Trend Plot	O	O	O	O	O
Bar Graph	O	O	O	O	O
X-Y Plot	O	O	O	O	O
S-V Plot	O	O	—	O	—
Shaft Centerline Plot	△	—	—	△	—
Polar Plot(Vector diagram)	△	—	—	△	—
Bode Plot	△	—	—	△	—
Orbit & Waveform Plot	△	—	—	△	—
Waveform Plot	O	O	—	O	—
Spectrum Plot	O	O	—	O	—
Waterfall Plot	O	O	—	O	—
Cascade Plot	O	O	—	O	—
Full Spectrum Plot	△	—	—	△	—
Full Waterfall Plot	△	—	—	△	—
Full Cascade Plot	△	—	—	△	—
Campbell Plot	△	—	—	△	—
Bearing Analysis	O	O	—	O	—

O : To display, △ : Display only for displacement vibration channel, — : Do not display

DIAGNOSTIC SOFTWARE

According to the device and analysis mode set in the device, the available diagnostic methods change in this system.

	DAQpod (Critical)	DAQpod (BOP)	VM-7B / VM-7	
Diagnostic method	Sleeve bearing diagnosis	Rolling bearing diagnosis	Rolling bearing diagnosis	Sleeve bearing diagnosis / Rolling bearing diagnosis

RELATED SOFTWARE

VM-772B Device Config
 : For device configuration, adjustment
VM-774B infiSYS Remote View
 : For vibration analysis, remote monitoring
VM-781B infiSYS Diagnostic Software
 : For vibration diagnosis of rotating equipment
VM-783B infiSYS Report Software
 : For report output
VM-784B infiSYS OPC Client Software
 : For OPC server communication

⚠ WARNING
 Some functions may not be available with old version.
 For details, please refer to "infiSYS Family Improvement Information" (6H16-011).

※ Items in this document are subject to change without notice.
※ The company and product names herein may be the trademarks or registered trademarks of their respective companies.

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Appendix 1

infiSYS RV-200 SYSTEM HARD DISK SPACE REQUIRED

FOR DATA STORAGE (FOR REFERENCE ONLY)

Short Term Data

Data Type	Single Data Size
Trend data (Critical) [*1]	151 [byte]
Trend data (BOP)	379 [byte]
Waveform data (Critical)[*2]	1,024 points : 8,294 [byte], 2,048 points : 16,486 [byte] 4,096 points : 32,870 [byte]
Waveform data (BOP)[*2]	1,024 points : 4,147 [byte], 2,048 points : 8,243 [byte] 4,096 points : 16,435 [byte]
Process data	75 [byte]

*1 Including overall, 1X amplitude/Phase, etc.
*2 Data size may vary depending on the number of sampling (lines).
    (Only "2,048 points" is applicable to VM-7B and VM-7.)

Data Type	Calculation
Trend data (Critical)	1 Trend data x 60 [sec] x 60 [min] x 24 [hrs] x (Short term data saving period + 1)
Trend data (BOP)	1 Trend data x 60 [sec] x 60 [min] x 24 [hrs] / 10 [sec] x (Short term data saving period + 1)
Waveform data	1 Waveform data x 60 [sec] x 60 [min] x 24 [hrs] / Waveform saving period x (Short term data saving period + 1)
Process data	1 Process data x 60 [sec] x 60 [min] x 24 [hrs] x (Short term data saving period + 1)

Long Term Data [*3]

Data Type	Calculation
Trend data[*4]	4 Trend data x 60 [min] x 24 [hrs] / Long term data saving interval x 365 [days] x (Long term data saving period + 1)
Waveform data	1 Waveform data x 24 [hrs] / Long term data saving interval x 365 [days] x (Long term data saving period + 1)
Process data	4 Process data x 60 [min] x 24 [hrs] / Long term data saving interval x 365 [days] x (Long term data saving period + 1)

*3 The data includes instantaneous, largest, smallest and mean values.
*4 The same calculation applies to Critical mode and BOP mode.

Alarm event data

Data Type	Calculation
Trend data (Critical)	(1 [day] to 3[day] of Trend data + Trend data at nearest point of the alarm event [*5]) x Number of alarm events
Trend data (BOP)	(1 [day] to 3[day] of Trend data x Number of alarm events
Waveform data	(1 [day] to 3[day] of Waveform data + Waveform data at nearest point of the alarm event [*6]) x Number of alarm events
Process data	(1 [day] to 3[day] of Process data x Number of alarm events

*5 The amount of data varies depending on the setting of the retention period of the alarm data and the alarm occurrence time. It will be 1 to 2 days if the holding period is ± 1, ± 3, ± 8 hours, 2 to 3 days in the case of ± 24 hours.
*5 Up to 400 trend items at nearest point of the alarm event. (Approx. 59.0K [byte])
*6 Up to 12 waveform items at nearest point of the alarm event.
   (Approx. 193.2K [byte] for 2,048 points)

Data during Transient Operation

Data Type	Calculation
Trend data(Critical)	1 [day] of Trend data x Number of transients
Trend data(BOP)	1 [day] of Trend data x Number of transients
Waveform data	(1 [day] of Waveform data + 1 Waveform data x Transient period / 10 [sec]) x Number of transients

EXAMPLE 1

Conditions

Device	: VM-7B Monitor	Long term data saving period : 1 [yr]
Number of channels	: 44ch	Long term data saving interval
Channel type	: Vibration only	: 10 [min] (Trend)
Number of waveform sampling : 2,048 points		Alarm event data : 100 items
Waveform saving interval (normal) : 60 [sec]		Transient period : 3600 [sec]
High speed acquisition	: OFF	Transient data : 100 items
Short term data saving period (trend)	: 7 [day]	Alarm data saving interval
Short term data saving period (waveform) : 7 [day]		: ±24[hour]／1 items

Short term data

Trend data (Critical)	1day data=151 [byte] x 60[sec] x 60[min] x 24[hrs] 1day data x (7 + 1) [day] =99.5M [byte]
Waveform data (Critical)	1day data=16,486 [byte] x 60[sec] x 60[min] x 24[hrs] / 60 [sec] 1day data x (7 + 1) [day] = 181.1M [byte]

Long term data

Trend data	151 [byte] x 4 x 60[min] x 24[hrs] / 10[min] x 365[day] x (1 + 1)[yrs] =60.6M [byte]

Alarm event data

Trend data (Critical)	(1day data x 3[day] + 59.0K [byte]) x 100[items] =3,738.4M [byte]
Waveform data (Critical)	(1day data x 3[day] + 193.2K [byte]) x 100[items] =6,810.9M [byte]

Transient period data

Trend data (Critical)	1day data x 100[items] =1,244.2M [byte]
Waveform data (Critical)	(1day data + 16,486 [byte] x 3,600[sec] / 10[sec]) x 100[items] =2,830.0M [byte]

Total
All data above x Number of channels
= 14,965M [byte] x 44 [Ch]= 643.0G [byte]

EXAMPLE 2

Conditions

Device	: DAQpod DP-2000	Long term data saving period : 1 [yr]
Number of channels : 20ch		Long term data saving interval
Channel type : Vibration (BOP)		: 10 [min] (Trend)
Number of waveform sampling : 2,048 points		Alarm event data : 100 items
Waveform saving interval (normal) : 60 [sec]		Transient period : 3600 [sec]
High speed acquisition : OFF		Transient data : 100 items
Short term data saving period (trend) : 7 [day]		Alarm data saving interval
Short term data saving period (waveform) : 7 [day]		: ±24[hour]／1 items

Short term data

Trend data (BOP)	1day data = 379 [byte] x 60[sec] x 60[min] x 24[hrs] / 10[sec] 1day data x (7 + 1) [day] = 25.0M [byte]
Waveform data (BOP)	1day data = 8,243 [byte] x 60[sec] x 60[min] x 24[hrs] / 60 [sec] 1day data x (7 + 1) [day] =90.6M [byte]

Long term data

Trend data	379 [byte] x 4[items] x 60[min] x 24[hrs] / 10[min] x 365[day] x (1 + 1)[yrs] =152.0M [byte]

Alarm event data

Trend data (BOP)	(1day data x 3[day] + 61.7K [byte]) x 100[items] =936.9M [byte]
Waveform data (BOP)	(1day data x 3[day] + 96.6K [byte]) x 100[items] =3,405.4M [byte]

Transient period data

Trend data (BOP)	1day data x 100[items] =312.3M [byte]
Waveform data (BOP)	(1day data + 8,243 [byte] x 3,600[sec] / 10[sec]) x 100[items] =1415.5M [byte]

Total
All data above x Number of channels
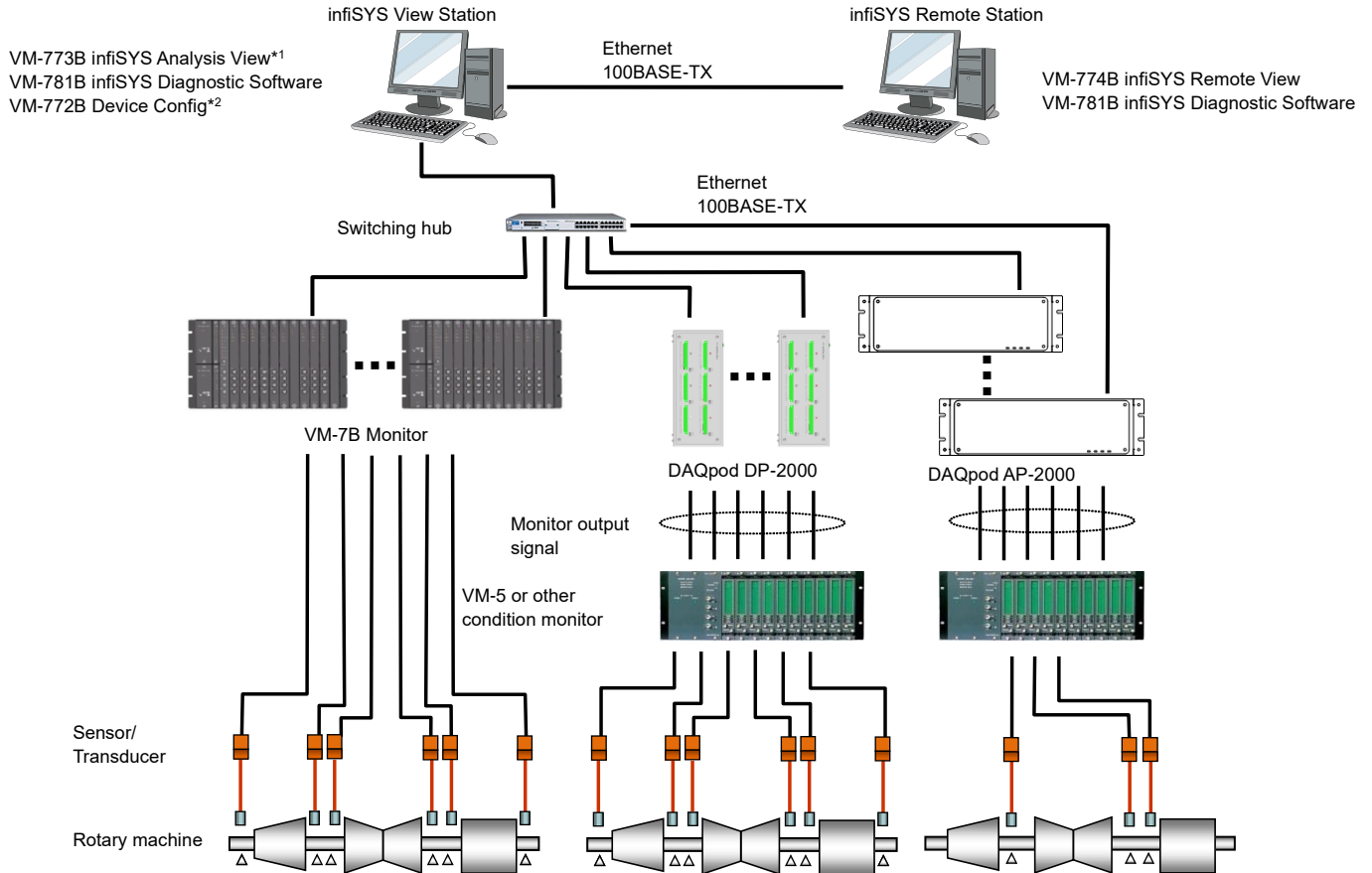= 6,245.7M [byte] x 20 [Ch]=122.0G [byte]

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SYSTEM CONFIGURATION

VM-773B infiSYS Analysis View*1
VM-781B infiSYS Diagnostic Software
VM-772B Device Config*2

infiSYS View Station

Ethernet 100BASE-TX

infiSYS Remote Station

VM-774B infiSYS Remote View
VM-781B infiSYS Diagnostic Software

Ethernet 100BASE-TX

Switching hub

VM-7B Monitor

DAQpod DP-2000

DAQpod AP-2000

Monitor output signal

VM-5 or other condition monitor

Sensor/ Transducer

Rotary machine

Figre 1 Example of condition monitoring system for large rotating machine

VM-773B infiSYS Analysis View *1

infiSYS View Station

Ethernet 100Base-TX

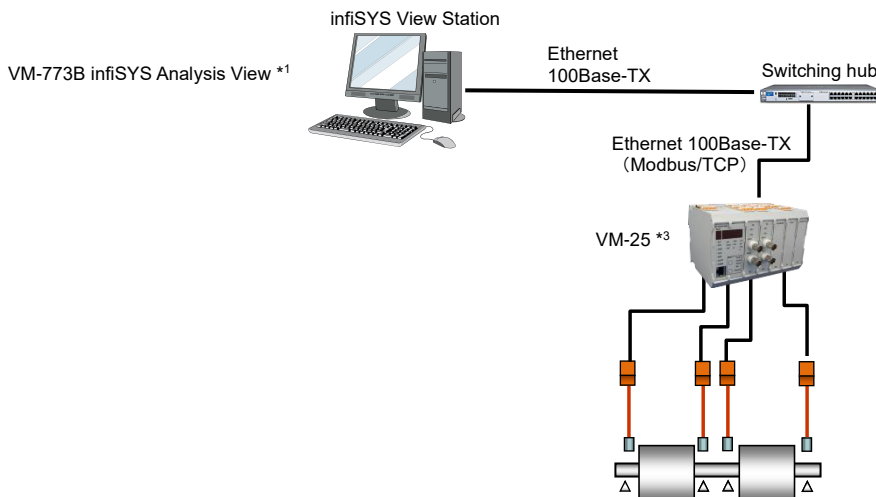Switching hub

Ethernet 100Base-TX
（Modbus/TCP）

VM-25 *3

Figre 2 Example of state monitoring system for small rotating machine

*1 Please refer to P1 and P2 for the values that can be collected from each device or the available graphs.
*2 VM-773B infiSYS analysis view and VM-772B device configuration can not communicate at the same time.
  When setting in the device configuration, please stop the infiSYS analysis view.
*3 When connected to a VM-25 or Modbus device, the infiSYS Analysis View can display the values collected from the device in a trend, long-term trend, or bar graph. Vibration waveforms can not be displayed.

SYSTEM CONFIGURATION

Chart 1: Restriction for data saving interval in VM-7B system

・In the case of waveform data collection interval is 1 second

Number of vibration channels	Trand data	Waveform data
1 to 12	○	○
13 to 44	○※1	△※2

・In the case of waveform data collection interval is 2 second

Number of vibration channels	Trand data	Waveform data
1 to 24	○	○
25 to 44	○※1	△※2

○ : Without data loss.

△ : Data loss may occur. (The frequency of occurrence of drop depends on the number of CH.)

*1 There is no loss of trend data storage, but the graph display update interval may be about 3 seconds.
*2 Collection of latest waveform data is delayed little by little. (Up to approx. 2 minutes)

- When an alarm has occurred or a high load is applied(e.g. during DB backup process) in infiSYS Analysis View, missing data may occur or missing data frequency may increase.
- If the waveform data collection interval is shortened, the amount of data stored in the database will increase. Check the hard disk size and set the appropriate settings.

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