As-Built

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VAN PHONG POWER COMPANY LIMITED

PROJECT

Van Phong 1 BOT Thermal Power Plant Project

OWNER'S ENGINEER

AFRY Switzerland Ltd.

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Specification for Vibration Monitoring and Analysis System

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Specification for Vibration Monitoring and Analysis System

AS BUILT

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CONTENTS

1. General

1.1 Scope

This document describes the specifications of the Vibration Monitoring and Analysis System for Turbine, Boiler, and BOP equipment.

1.2 Related Documents

Lot2(TSB) portion

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- Specification for TSI Cabinet VP1-C-L2-I-CY-00020
- Schematic Diagrams for Turbine Supervisory Instrument VP1-C-L2-I-CY-00028
- Schematic Diagrams for Vibration Monitoring System VP1-C-L2-I-CY-00050
- Control Diagram for Steam Turbine VP1-C-L2-M-MAA-00009
- Control Diagram for BFP Turbine VP1-C-L2-M-MAA-00007
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2. System Outline

VMAS (Vibration Monitoring and Analysis System) provides the information for understanding vibration condition in detail, by showing vibration frequency and vibration phase angle as well as vibration amplitude. It is applied the “infiSYS RV-200” of Shinkawa to VMAS.

3. Monitoring equipment

VMAS monitors and analyzes the vibration of the equipment shown in Table-1.
These object equipment is chosen by each Lot.

Table-1 Monitoring Equipment

Unit or Common	Equipment	Supplier	Sensor Q'ty
Unit1/Unit2	Steam Turbine and Generator	Lot2	33 x 2
Unit1/Unit2	BFP Turbine x 2	Lot2	10 x 2
Unit1/Unit2	T-BFP x 2, T-BFP BP x 2, T-BFP RG x2	Lot2	20 x 2
Unit1/Unit2	M-BFP x 1, M-BFP BP x 1, M-BFP MOT x 2, M-BFP FLU CPL x 1	Lot2	19 x 2
Unit1/Unit2	CEP x 2, CEP MOT x 2	Lot2	14 x 2
Unit1/Unit2	CBP x 2, CBP MOT x 2	Lot2	18 x 2
Unit1/Unit2	FDF x 2	Lot1	4 x 2
Unit1/Unit2	PAF x 2	Lot1	4 x 2
Unit1/Unit2	Pulverizer x 5	Lot1	5 x 2
Unit1/Unit2	IDF x 2	Lot3	20 x 2
Unit1/Unit2	Circulating Water Pump x 2	Lot3	16 x 2
Unit1/Unit2	Closed Cooling Water Pump (CCWP) x 2	Lot3	12 x 2
Common	SWFGD – Absorber Pump x 3	Lot3	12
Common	SWFGD – Oxidation Blower x 3	Lot3	24
Common	Coal Crusher x 2	Lot3	16
Common	IA / PA Compressor x 4	Lot3	28
Common	Service Water Transfer Pump x 2	Lot3	8
Common	Recovery Water Pump x 2	Lot3	6

Please refer to each Lot document for Measurement point and Sensor specification etc.

4. System Configuration

System configuration of Vibration Monitoring and Analysis System is shown on Fig.1.

Each vibration signal from sensor is input in vibration monitor located at local monitor rack or electrical room near object equipment
In vibration monitor, vibration amplitude, frequency and phase angle are measured and transmitted to Server PC via Ethernet cable or optical fiber cable.
One Server PC covers Unit1 and Common, another Server PC covers Unit2 equipment vibration.
Server PC takes in vibration data and performs various graph displays, historical data storage.

Vibration sensor and monitor are supplied by each lot of object equipment.

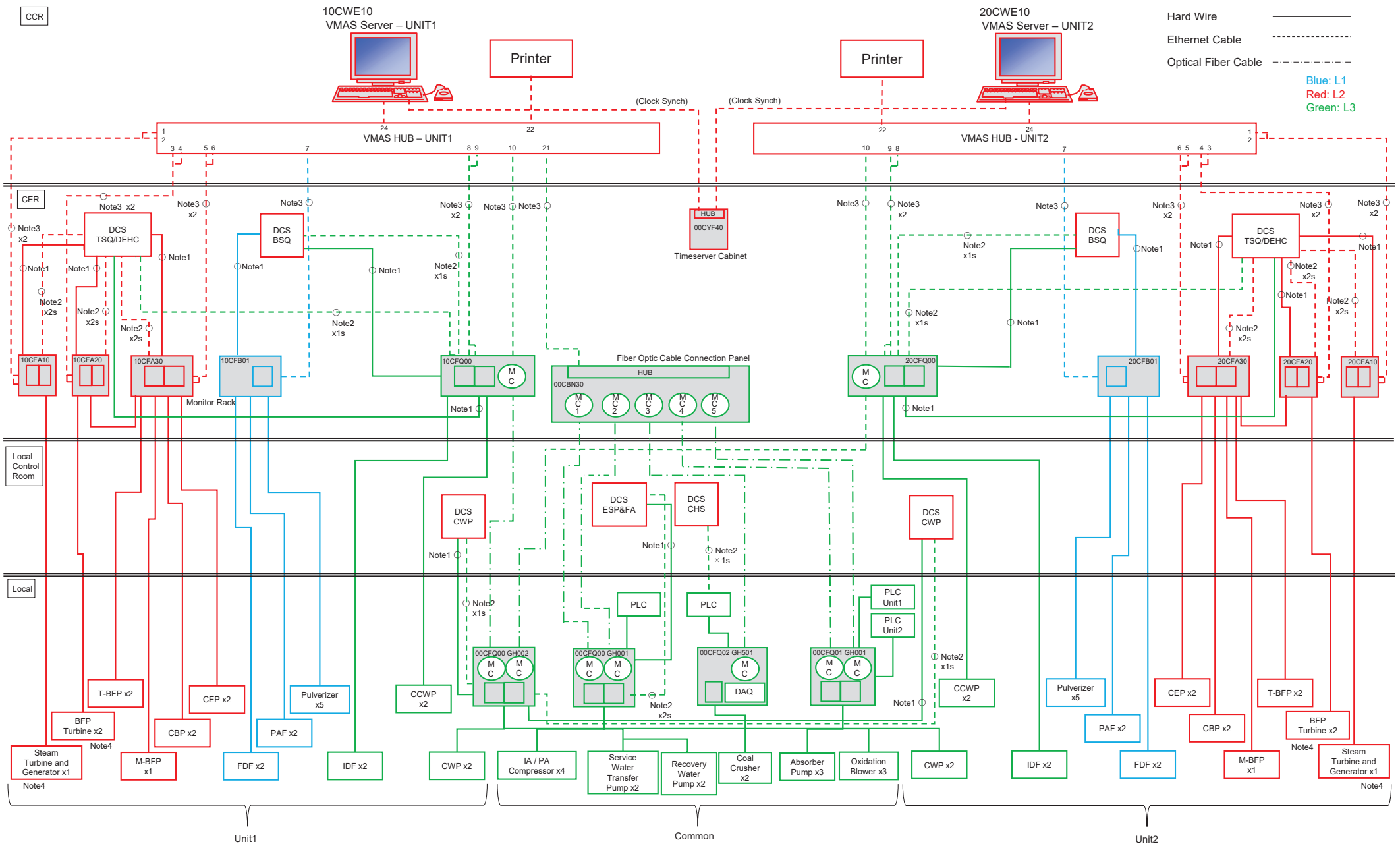

Fig.1 System configuration

Note1: Hard wire connection for interlock (trip) purpose at DCS/DEHC and for process input to VMAS.
Note2: Data link connection for monitoring purpose at DCS. (“1s” means redundant 1set for VM-7B one(1) rack. “2s” means two(2) racks.)
Note3: Data link connection for vibration analysis function at VMAS.
Note4: MT & BFPT speed & over speed is directly connected to DEHC & TSQ, and zero speed is connected & monitored in TSI.

5. Specification (Lot2 portion)

5.1. Sensor (At Local)

Installation Location	Item	Specification	Remarks
T-BFP/T-BFP BSTR PP/M-BFP/ M-BFP BSTR PP/ M-BFP MOT Vibration, Key phasor	Type	Non Contacting Proximity(Eddy current)	FK-202F
	Liner range	2mm	
	Scale Factor(error)	7.87V/mm(within ±6.5%)	
	Frequency response	0 ~ 10 kHz (-3dB)	
	Body material	Stainless Steel	
	IP rating	IP67 equivalent	
	Operating temperature	-40 ~ 177 ℃ (Probe), -40 ~ 177 ℃ (Extension cable), -40 ~ 80℃(Driver)	
	Operating humidity	30 ~ 95% RH(non-condensing)	
CEP/CBP Vibration	Type	Acceleration	CB-101
	Transverse sensitivity	Less than 5%	
	Frequency response	2Hz to 10kHz ±5% 0.8Hz to 15kHz ±3db	
	Body material	Stainless Steel	
	Operating temperature	-55 ~ 140℃	
	Operating humidity	100% RH	
	Sensitivity	100mV/g±10% Nominal 80Hz at 22℃	
	Protection Rating	IP67	

BSTR PP:BOOSTER PUMP , MOT:MOTOR

Please refer to Lot1 and Lot3 reference document for Sensor specification of other object equipment.

5.2. Monitor (Inside Monitor Rack)

Installation Location	Item	Specification	Remarks
VMAS monitor	Input voltage	AC100-240V 50/60Hz, DC110-220V	Redundant (DC & UPS)
	Operating temperature	0 ~ 65℃	
	Operating humidity	20 ~ 95% RH(non-condensing)	
	Accuracy	±1%F.S. at 25degC	
	Data communication protocol	Modbus/TCP	
	Data transmission line	Redundancy	
	Relay contact rating	AC250V/5A, DC30V/5A	

Please refer to Lot1 and Lot3 reference document for Monitor specification of other object equipment.

5.3. Server PC

Item	Specification	Remarks
Type	Server PC	
Manufacture	DELL	
Model	PowerEdge T440	
Power supply	100 – 240VAC,50/60Hz, 1100W	Single UPS
CPU	Intel Xeon Silver 4210R 2.2GHz	
Memory	8GB x2	
HDD	4TB 7.2krpm RPM SATA 6Gbps x3	
Network Interface	Ethernet 1Gb 2-port BASE-T On-board LOM	

5.4. Display

Item	Specification	Remarks
Type	Color LCD	
Manufacture	DELL	
Model	2422H	
Power supply	100 – 240VAC,50/60Hz 1.5A(standard)	Single UPS
Size	537.8×166×356.1 (mm) 23.8ich	

5.5. Printer

Item	Specification	Remarks
Type	Color Inkjet Printer	
Manufacture	HP	
Model	Pagewide Pro 552dw	
Power supply	100 – 240VAC,50/60Hz (70W at printing)	Normal AC

5.6. HUB

Item	Specification	Remarks
Type	Switching HUB	
Manufacture	Hirschmann	
Model	MACH102-8TP	
Power supply	100 – 240VAC,50/60Hz	Single UPS
Ethernet Interface	10/100/1000Mbits, RJ-45	
Ports	24Port	

5.7. MAINTENANCE PC

Item	Specification	Remarks
Type	LAPTOP PC	
Manufacture	DELL	
Model	Latitude 3520	
Power supply	65W AC Adapter	
Operation System	Windows 10 Pro	
CPU	Intel Core i3 – 1005G1	
Memory	4GB	

*Maintenance PC is provided 1pc. as per unit. (Location: “TSI A” panel)

6. Input signal (Lot2 portion)

6.1. Vibration Data

Refer to Table-2, 3, 4.

Please refer to Lot1 and Lot3 reference document for vibration data from local sensor of other object equipment.

6.2. Process Data

Refer to Table-5.

Table-2 Input signal for Main Turbine

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
1.	*0MAY10 CS004	*0MAY10 CS054	Turbine zero speed A	Eddy current	rpm	0 - 5000	---	---	---	---	No	(1 out of 2)
2.	*0MAY10 CS005	*0MAY10 CS055	Turbine zero speed B	Eddy current	rpm	0 - 5000	---	---	---	---	No	(1 out of 2) Refer note 2
3.	*0MAA10 CY005	*0MAA10 CY055	Keyphasor	Eddy current	---	---	---	---	---	---	Yes	
4.	*0MAY10 CS006	---	Turbine speed A	Electro-magnetic induction	rpm	0 - 3600	---	>3345	✔	✔	No	(2 out of 3) Refer note 1,
5.	*0MAY10 CS007	---	Turbine speed B	Electro-magnetic induction	rpm	0 - 3600	---	>3345	✔	✔	No	(2 out of 3) Refer note 1
6.	*0MAY10 CS008	---	Turbine speed C	Electro-magnetic induction	rpm	0 - 3600	---	>3345	✔	✔	No	(2 out of 3) Refer note 1
7.	*0MAY10 CS001	---	Turbine over speed A	Electro-magnetic induction	rpm	0 - 3600	---	>3315	✔	✔	No	(2 out of 3) Refer note 1
8.	*0MAY10 CS002	---	Turbine over speed B	Electro-magnetic induction	rpm	0 - 3600	---	>3315	✔	✔	No	(2 out of 3) Refer note 1
9.	*0MAY10 CS003	---	Turbine over speed C	Electro-magnetic induction	rpm	0 - 3600	---	>3315	✔	✔	No	(2 out of 3) Refer note 1
10.	*0MAY10 CY001	*0MAY10 CY051	BRG 1 relative shaft vibration - X	Eddy current	μ mPP	0 - 400	>125	>175	✔	✔	Yes	
11.	*0MAY10 CY002	---	BRG 1 absolute bearing vibration - X	Velocity	μ mPP	0 - 400	---	---	---	---	No	Refer note 2
12.	*0MAY10 CY003	*0MAY10 CY053	BRG 1 relative shaft vibration - Y	Eddy current	μ mPP	0 - 400	>125	>175	✔	✔	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
13.	*0MAY10 CY004	---	BRG 1 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
14.	*0MAY10 CY005	*0MAY10 CY055	BRG 2 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
15.	*0MAY10 CY006	---	BRG 2 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
16.	*0MAY10 CY007	*0MAY10 CY057	BRG 2 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
17.	*0MAY10 CY008	---	BRG 2 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
18.	*0MAY10 CY009	*0MAY10 CY059	BRG 3 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
19.	*0MAY10 CY010	---	BRG 3 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
20.	*0MAY10 CY011	*0MAY10 CY061	BRG 3 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
21.	*0MAY10 CY012	---	BRG 3 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
22.	*0MAY10 CY013	*0MAY10 CY063	BRG 4 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
23.	*0MAY10 CY014	---	BRG 4 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
24.	*0MAY10 CY015	*0MAY10 CY065	BRG 4 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
25.	*0MAY10 CY016	---	BRG 4 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
26.	*0MAY10 CY017	*0MAY10 CY067	BRG 5 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
27.	*0MAY10 CY018	---	BRG 5 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
28.	*0MAY10 CY019	*0MAY10 CY069	BRG 5 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
29.	*0MAY10 CY020	---	BRG 5 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
30.	*0MAY10 CY021	*0MAY10 CY071	BRG 6 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
31.	*0MAY10 CY022	---	BRG 6 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
32.	*0MAY10 CY023	*0MAY10 CY073	BRG 6 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
33.	*0MAY10 CY024	---	BRG 6 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
34.	*0MAY10 CY025	*0MAY10 CY075	BRG 7 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
35.	*0MAY10 CY026	---	BRG 7 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
36.	*0MAY10 CY027	*0MAY10 CY077	BRG 7 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
37.	*0MAY10 CY028	---	BRG 7 absolute bearing vibration - Y	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
38.	*0MAY10 CY029	*0MAY10 CY079	BRG 8 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
39.	*0MAY10 CY030	---	BRG 8 absolute bearing vibration - X	Velocity	µ mPP	0 - 400	---	---	---	---	No	Refer note 2
40.	*0MAY10 CY031	*0MAY10 CY081	BRG 8 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
41.	*0MAY10 CY032	---	BRG 8 absolute bearing vibration - Y	Velocity	μ mPP	0 - 400	---	---	---	---	No	Refer note 2
42.	*0MAY10 CG005	*0MAY10 CG055	Eccentricity	Eddy current	μ mPP	0 - 500	>100	---		---	No	
43.	*0MAA10 CY001	*0MAA10 CY051	HPT differential expansion A	Eddy current	mm	0 - 25	<1.9 >23.1	---	✔	---	No	(1 out of 2)
44.	*0MAA10 CY002	*0MAA10 CY052	HPT differential expansion B	Eddy current	mm	0 - 25	<1.9 >23.1	---	✔	---	No	(1 out of 2) Refer note 2
45.	*0MAC10 CY001	*0MAC10 CY051	LPT differential expansion A-1	Eddy current	mm	0 - 50	<10.8 >39.2	---	✔	---	No	(1 out of 2)
46.	*0MAC10 CY002	*0MAC10 CY052	LPT differential expansion A-2	Eddy current								
47.	*0MAC10 CY003	*0MAC10 CY053	LPT differential expansion B-1	Eddy current	mm	0 - 50	<10.8 >39.2	---	✔	---	No	(1 out of 2) Refer note 2
48.	*0MAC10 CY004	*0MAC10 CY054	LPT differential expansion B-2	Eddy current								
49.	*0MAA10 CY003	---	Case expansion left	LVDT	mm	0 - 50	---	---	---	---	No	(1 out of 2)
50.	*0MAA10 CY004	---	Case expansion right	LVDT	mm	0 - 50	---	---	---	---	No	(1 out of 2) Refer note 2
51.	*0MAY10 CG002	*0MAY10 CG052	Thrust position A	Eddy current	mm	-1.5 - 0 - +2.5	<-0.51 > α +0.51	<-1.02 > α +1.32	✔	✔	No	(2 out of 3)
52.	*0MAY10 CG003	*0MAY10 CG053	Thrust position B	Eddy current	mm	-1.5 - 0 - +2.5	<-0.51 > α +0.51	<-1.02 > α +1.32	✔	✔	No	(2 out of 3)
53.	*0MAY10 CG004	*0MAY10 CG054	Thrust position C	Eddy current	mm	-1.5 - 0 - +2.5	<-0.51 > α +0.51	<-1.02 > α +1.32	✔	✔	No	(2 out of 3)

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

Table-3 Input signal for BFP Turbine

BFP Turbine (A)

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
1.	*0LAY10 CS007	*0LAY10 CS057	BFPT A Turbine zero speed	Eddy current	rpm	0 - 8000	---	---	---	---	No	
2.	*0LAY10 CS008	*0LAY10 CS058	BFPT A Keyphasor	Eddy current	---	---	---	---	---	---	Yes	
3.	*0LAY10 CS001	---	BFPT A Turbine speed A	Electro-magnetic induction	rpm	0 - 7200	---	>6420	✔	✔	No	(2 out of 3) Refer note 1
4.	*0LAY10 CS002	---	BFPT A Turbine speed B	Electro-magnetic induction	rpm	0 - 7200	---	>6420	✔	✔	No	(2 out of 3) Refer note 1
5.	*0LAY10 CS003	---	BFPT A Turbine speed C	Electro-magnetic induction	rpm	0 - 7200	---	>6420	✔	✔	No	(2 out of 3) Refer note 1
6.	*0LAY10 CS004	---	BFPT A Turbine over speed A	Electro-magnetic induction	rpm	0 - 7200	---	>6300	✔	✔	No	(2 out of 3) Refer note 1
7.	*0LAY10 CS005	---	BFPT A Turbine over speed B	Electro-magnetic induction	rpm	0 - 7200	---	>6300	✔	✔	No	(2 out of 3) Refer note 1
8.	*0LAY10 CS006	---	BFPT A Turbine over speed C	Electro-magnetic induction	rpm	0 - 7200	---	>6300	✔	✔	No	(2 out of 3) Refer note 1
9.	*0LAY10 CY021	*0LAY10 CY071	BFPT A BRG 1 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
10.	*0LAY10 CY022	*0LAY10 CY072	BFPT A BRG 1 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
11.	*0LAY10 CY023	*0LAY10 CY073	BFPT A BRG 2 relative shaft vibration - X	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	
12.	*0LAY10 CY024	*0LAY10 CY074	BFPT A BRG 2 relative shaft vibration - Y	Eddy current	µ mPP	0 - 400	>125	>175	✔	✔	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
13.	*0LAY10 CS009	*0LAY10 CS059	BFPT A Eccentricity	Eddy current	μ mPP	0 - 500	>50	---	✔	---	No	
14.	*0LAY10 CG011	*0LAY10 CG061	BFPT A Thrust position A	Eddy current	mm	-2 – 0 – +2	<-0.4 >0.68	<-0.7 >0.98	✔	✔	No	(2 out of 3)
15.	*0LAY10 CG012	*0LAY10 CG062	BFPT A Thrust position B	Eddy current	mm	-2 – 0 – +2	<-0.4 >0.68	<-0.7 >0.98	✔	✔	No	(2 out of 3)
16.	*0LAY10 CG013	*0LAY10 CG063	BFPT A Thrust position C	Eddy current	mm	-2 – 0 – +2	<-0.4 >0.68	<-0.7 >0.98	✔	✔	No	(2 out of 3)

Abbreviation

- BFPT: Boiler Feedwater Pump Drive Turbine

BFP Turbine (B)

Change KKS No. from “***1” to “***2” and Description from “BFPT A” to “BFPT B” as BFP Turbine (A).

Note:

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2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

Table-4 Input signal for T-BFP/M-BFP/CEP/CBP

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
1.	*0LAC10 CY001	N/A	T-BFP A BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
2.	*0LAC10 CY002	N/A	T-BFP A BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
3.	*0LAC10 CY003	N/A	T-BFP A BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
4.	*0LAC10 CY004	N/A	T-BFP A BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
5.	*0LAC10 CY005	N/A	T-BFP A BP BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
6.	*0LAC10 CY006	N/A	T-BFP A BP BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
7.	*0LAC10 CY007	N/A	T-BFP A BP BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
8.	*0LAC10 CY008	N/A	T-BFP A BP BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
9.	*0LAC20 CY001	N/A	T-BFP B BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
10.	*0LAC20 CY002	N/A	T-BFP B BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
11.	*0LAC20 CY003	N/A	T-BFP B BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
12.	*0LAC20 CY004	N/A	T-BFP B BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
13.	*0LAC20 CY005	N/A	T-BFP B BP BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
14.	*0LAC20 CY006	N/A	T-BFP B BP BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
15.	*0LAC20 CY007	N/A	T-BFP B BP BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
16.	*0LAC20 CY008	N/A	T-BFP B BP BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
17.	*0LAC30 CY001	N/A	M-BFP BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
18.	*0LAC30 CY002	N/A	M-BFP BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
19.	*0LAC30 CY003	N/A	M-BFP BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
20.	*0LAC30 CY004	N/A	M-BFP BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
21.	*0LAC30 CY005	N/A	M-BFP BP BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
22.	*0LAC30 CY006	N/A	M-BFP BP BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
23.	*0LAC30 CY007	N/A	M-BFP BP BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
24.	*0LAC30 CY008	N/A	M-BFP BP BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
25.	*0LAC30 CY009	N/A	M-BFP M1 BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
26.	*0LAC30 CY010	N/A	M-BFP M1 BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
27.	*0LAC30 CY011	N/A	M-BFP M1 BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
28.	*0LAC30 CY012	N/A	M-BFP M1 BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
29.	*0LAC30 CY013	N/A	M-BFP M2 BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
30.	*0LAC30 CY014	N/A	M-BFP M2 BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
31.	*0LAC303 CY015	N/A	M-BFP M2 BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
32.	*0LAC30 CY016	N/A	M-BFP M2 BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
33.	*0LAC30 CY019	*0LAC30 CY069	M-BFP KEYPHASOR	Eddy current	---	---	---	---	---	---	Yes	
34.	*0LCB10 CS031	*0LCB10 CS081	CEP A KEYPHASOR	Eddy current	---	---	---	---	---	---	Yes	
35.	*0LCB10 CY025	N/A	CEP A BRG VIB X	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
36.	*0LCB10 CY026	N/A	CEP A BRG VIB Y	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
37.	*0LCB10 CY027	N/A	CEP A M BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
38.	*0LCB10 CY028	N/A	CEP A M BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
39.	*0LCB10 CY029	N/A	CEP A M BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
40.	*0LCB10 CY030	N/A	CEP A M BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
41.	*0LCB20 CS031	*0LCB20 CS081	CEP B KEYPHASOR	Eddy current	---	---	---	---	---	---	Yes	
42.	*0LCB20 CY025	N/A	CEP B BRG VIB X	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
43.	*0LCB20 CY026	N/A	CEP B BRG VIB Y	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
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3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
44.	*0LCB20 CY027	N/A	CEP B M BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
45.	*0LCB20 CY028	N/A	CEP B M BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
46.	*0LCB20 CY029	N/A	CEP B M BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
47.	*0LCB20 CY030	N/A	CEP B M BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
48.	*0LCB30 CS010	*0LCB30 CS060	CBP A Keyphasor	Eddy current	---	---	---	---	---	---	Yes	
49.	*0LCB30 CY001	N/A	CBP A BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
50.	*0LCB30 CY002	N/A	CBP A BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
51.	*0LCB30 CY003	N/A	CBP A BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
52.	*0LCB30 CY004	N/A	CBP A BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
53.	*0LCB30 CY011	N/A	CBP A M BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
54.	*0LCB30 CY012	N/A	CBP A M BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
55.	*0LCB30 CY013	N/A	CBP A M BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
56.	*0LCB30 CY014	N/A	CBP A M BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
57.	*0LCB40 CS010	*0LCB40 CS060	CBP B KEYPHASOR	Eddy current	---	---	---	---	---	---	Yes	
58.	*0LCB40 CY001	N/A	CBP B BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

S. No.	KKS No		Description	Sensor Type	Unit	Range	Alarm Point (Refer note 3)		Purpose		For VMAS required (Yes/No)	Remarks
	Sensor	Driver					High (H)	Hi-Hi (HH)	Alarm (A)	Trip at HH (I)		
59.	*0LCB40 CY002	N/A	CBP B BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
60.	*0LCB40 CY003	N/A	CBP BBRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
61.	*0LCB40 CY004	N/A	CBP B BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>6.3	>9.5	✔	---	Yes	
62.	*0LCB40 CY011	N/A	CBP B M BRG VIB X (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
63.	*0LCB40 CY012	N/A	CBP B M BRG VIB Y (DE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
64.	*0LCB40 CY013	N/A	CBP B M BRG VIB X (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
65.	*0LCB40 CY014	N/A	CBP B M BRG VIB Y (NDE SIDE)	Acceleration	mm/s	0 - 25	>3.4	>7.1	✔	---	Yes	
66.	*0LAC10 CY009	N/A	T-BFP A GB VIB (BP SIDE)	Acceleration	mm/s	0 - 25	>5.6	>8.8	✔	---	No	
67.	*0LAC10 CY010	N/A	T-BFP A GB VIB (T-BFP SIDE)	Acceleration	mm/s	0 - 25	>5.6	>8.8	✔	---	No	
68.	*0LAC20 CY009	N/A	T-BFP B GB VIB (BP SIDE)	Acceleration	mm/s	0 - 25	>5.6	>8.8	✔	---	No	
69.	*0LAC20 CY010	N/A	T-BFP B GB VIB (T-BFP SIDE)	Acceleration	mm/s	0 - 25	>5.6	>8.8	✔	---	No	
70.	*0LAC30 CY017	N/A	M-BFP FLU CPL HOUS VIB INPUT SIDE	Acceleration	mm/s	0 - 25	>5.6	>8	✔	---	No	VP1-C-L2-P-LAC-00003
71.	*0LAC30 CY018	N/A	M-BFP FLU CPL HOUS VIB PRM SIDE	Acceleration	mm/s	0 - 25	>5.6	>8	✔	---	No	VP1-C-L2-P-LAC-00003

Note:

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3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

Abbreviation

- BFP: Boiler Feedwater Pump

-T-BFP: Turbine Driven Boiler Feedwater Pump

-T-BFP BP: Turbine Driven Boiler Feedwater Booster Pump

-T-BFP RG: Turbine Driven Boiler Reduction Gear

-M-BFP: Motor Driven Boiler Feedwater Pump

-M-BFP FLU CPL: Motor Driven Boiler Feedwater Pump Fluid Coupling

-CEP: Condensate Extraction Pump

-CBP: Condensate Booster Pump

-M: Motor-BP: Booster Pump

Note:

1. This sensor is connected to DEHC or TSQ cabinet as per Toshiba standard design & practice. However, Turbine zero speed is connected & monitored in TSI System.
2. This sensor is not required as per the standard design & practice of Toshiba, however same is provided, due to the customer specification.
3. Description, Range and Alarm points indicated are tentative and will be finalized during engineering stage.

Table-5 Input signal (Process Data)

No.	Description	Range	From	To
1	Steam Turbine Generator Output	0-673 MW	TSQ	TSI Monitor
2	Main steam temperature	0-600 degC	MT-EHC	TSI Monitor
3	Main steam pressure	0-35 MPag	MT-EHC	TSI Monitor

7. Function

7.1. Data storage

This system stores the following data.

Operation mode	Data type	Interval of stored data
Steady state	Trend data (*1)	Short term：1sec Long term ：10min/20min/60min/120min
	Waveform data (*2)	Short term：10sec/20sec/30sec/1min/2min/3min/5min/10min Long term ：1yr/2yrs/3yrs/4yrs/5yrs
Startup (*3)	Trend data (*1)	1sec
	Waveform data (*2)	Complies with setting of ⊿t or ⊿rpm
Shutdown (*3)	Trend data (*1)	1sec
	Waveform data (*2)	Complies with setting of ⊿t or ⊿rpm

*1 Trend data : Direct, Gap, 1X, 2X, Not 1X、Speed
*2 Waveform data : Waveform、Orbit、Spectrum
*3 The equipment with keyphasor sensor installation only.

7.2. Display Plot

This system provides the following plots.

infiSYS RV-200	Item(Plots)	Variables	TURB/ GEN/ BFPT/ TBFP/ MBFP	CWP	CCWP	ID-FAN	Compressor	Service Water Transfer Pump	Absorber Pump	Oxidation Blower	Coal Crusher	Other Auxiliary	Reference	Remarks
1	Trend	Direct	■	■	■	■	■	■	■	■	■	■	Fig-7.1	The system can trend vibration.
2	Orbit & Waveform	Waveform	■	■	■	■	■ Note1	□	■	■	□	□	Fig-7.2	The dynamic motion pattern of shaft centerline is displayed.
3	Waveform	Waveform	■	■	■	■	■ Note1	■	■	■	■	■	Fig-7.3	The Vibration vs. time characteristics of vibration is displayed.
4	Polar	1X	■	■	□	■	□	□	□	□	□	□	Fig-7.4	The response of vibration vector collected during machine transient is displayed.
5	Bode	1X	■	■	□	■	□	□	□	□	□	□	Fig-7.5	The vibration vector phase and vibration response is plotted.
6	Shaft Centerline	Gap	■	■	■	■	■ Note1	□	■	■	□	□	Fig-7.6	A pair of X-Y probes of centerline is combined to plot the movement of the shaft centerline.
7	Spectrum	Waveform	■	■	■	■	■ Note1	■	■	■	■	■	Fig-7.7	The vibration vs. frequency characteristics of vibration is displayed.
8	Cascade	Waveform	■	□	□	□	□	□	□	□	□	□	Fig-7.8	The spectrum plot taken during transient is displayed.
9	S-V	Direct	■	■	□	■	□	□	□	□	□	□	Fig-7.9	The speed vs. vibration characteristic of vibration is displayed.
10	X-Y	Direct	■	■	■	■	■ Note1	□	■	■	□	■	Fig-7.10	The load vs. vibration characteristics of vibration is displayed.
11	Waterfall	Waveform	■	□	□	□	□	□	□	□	□	■	Fig-7.11	The spectrum plot taken during time is displayed.
12	Read time display of current measurements	Direct	■	■	■	■	■ Note1	■	■	■	■	■	Fig-7.12	The List of Current Values displays the latest vibration values at all measurement points connected to the infiSYS RV-200 View Station in numerical values.
13	Multi-variable trend displays	Direct	■	■	■	■	■ Note1	■	■	■	■	■	Fig-7.13	A trend plot is a time-series plot with the X-axis as a time axis and depicts changes in the measurement value of each measurement point or in analysis data over time.
14	Time-stamped alarm list and system event list	Direct	■	■	■	■	■ Note1	■	■	■	■	■	Fig-7.14	Using Event History, you can extract and view the hardware history obtained from the VM-7 series monitor and the software history stored in the infiSYS Analysis View database (alarm history, transient history, system history) according to the specified conditions.

■: Function is applicable

□: Function is not applicable

Note1: This vibration analysis function will not be applicable on compressor end but motor end for IA/PA compressor.

Fig-7.1：Trend plot

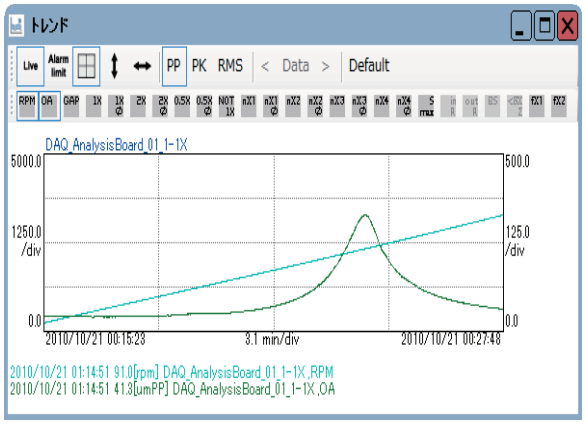


Fig-7.2：Orbit & Waveform plot

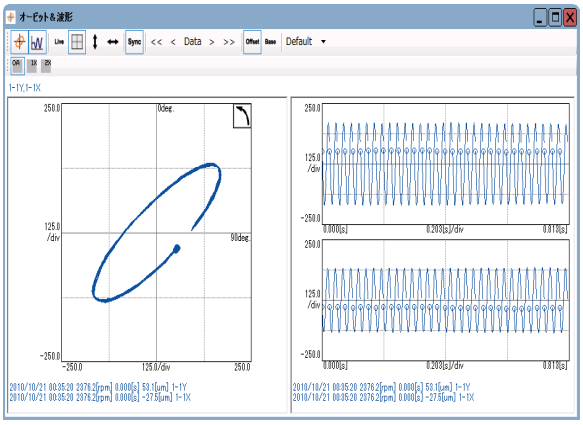


Fig-7.3：Waveform plot

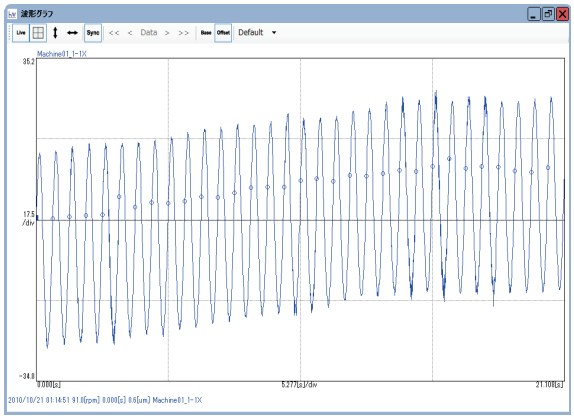


Fig-7.4：Polar plot

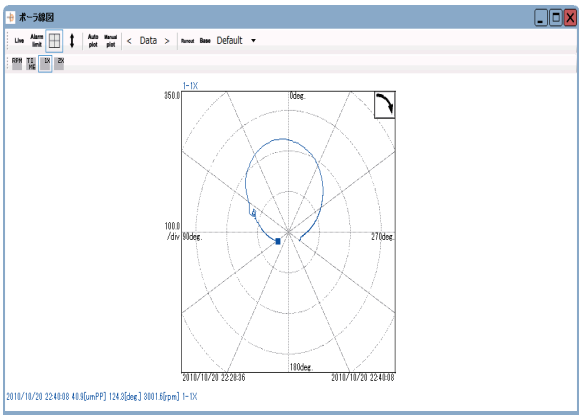


Fig-7.5：Bode plot

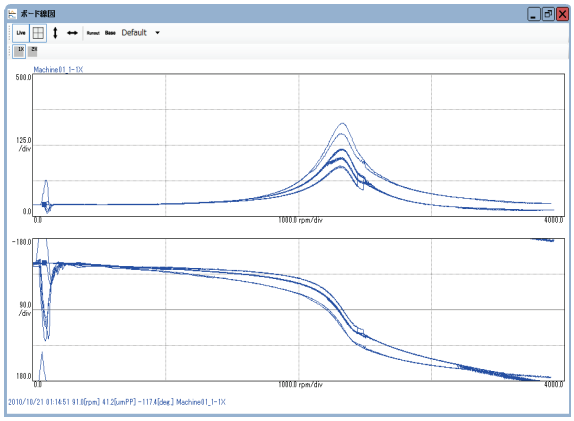


Fig-7.6：Shaft Centerline plot

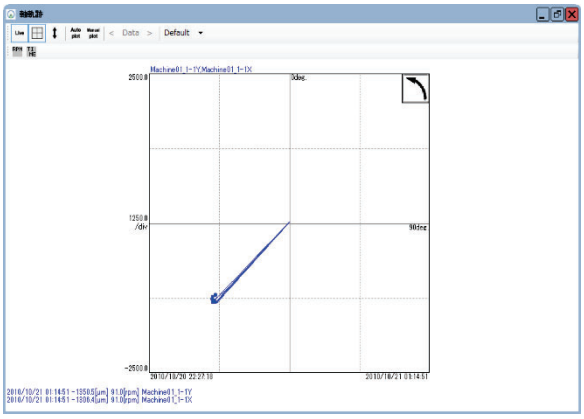


Fig-7.7：Spectrum plot

Fig-7.8：Cascade plot

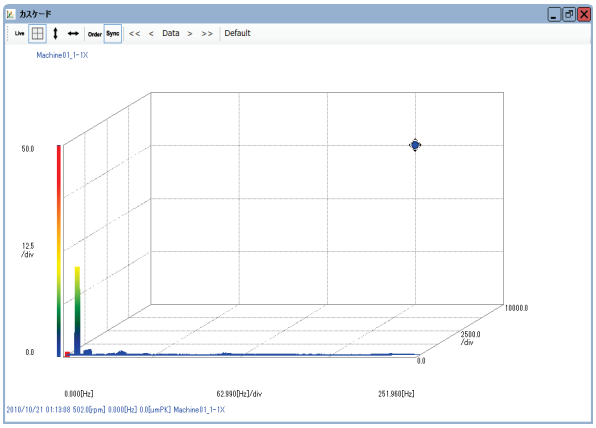


Fig-7.9：S-V plot

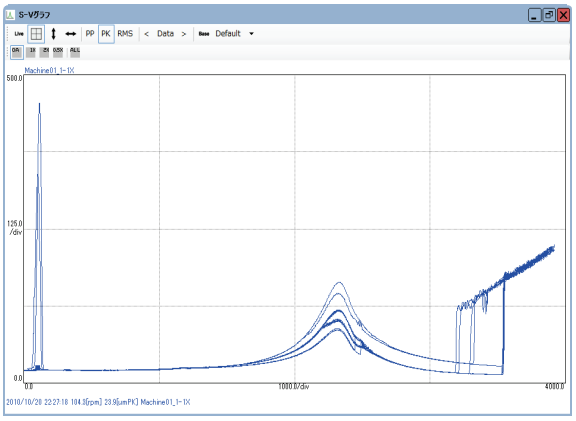


Fig-7.10：X-Y plot

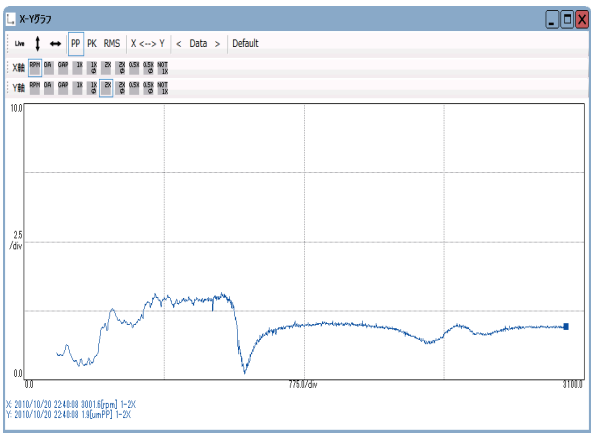


Fig-7.11：Waterfall plot

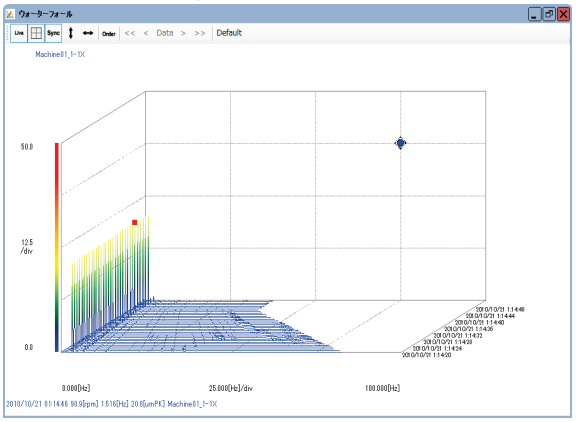
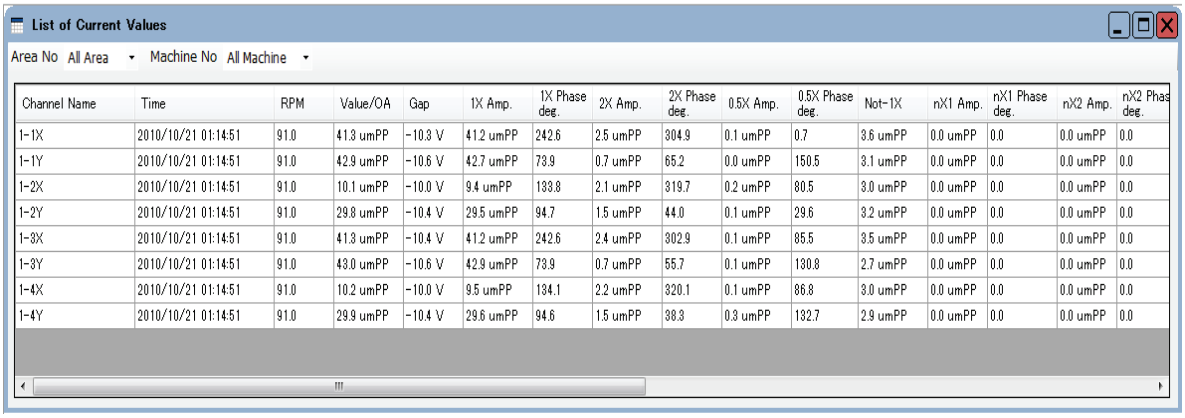


Fig-7.12：Read time display of current measurements



Channel Name	Time	RPM	Value/OA	Gap	1X Amp.	1X Phase deg.	2X Amp.	2X Phase deg.	0.5X Amp.	0.5X Phase deg.	Not-1X	nX1 Amp.	nX1 Phase deg.	nX2 Amp.	nX2 Phas deg.
1-1X	2010/10/21 01:14:51	91.0	41.3 umPP	-10.3 V	41.2 umPP	242.6	2.5 umPP	304.9	0.1 umPP	0.7	3.6 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-1Y	2010/10/21 01:14:51	91.0	42.9 umPP	-10.6 V	42.7 umPP	73.9	0.7 umPP	65.2	0.0 umPP	150.5	3.1 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-2X	2010/10/21 01:14:51	91.0	10.1 umPP	-10.0 V	9.4 umPP	133.8	2.1 umPP	319.7	0.2 umPP	80.5	3.0 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-2Y	2010/10/21 01:14:51	91.0	29.8 umPP	-10.4 V	29.5 umPP	94.7	1.5 umPP	44.0	0.1 umPP	29.6	3.2 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-3X	2010/10/21 01:14:51	91.0	41.3 umPP	-10.4 V	41.2 umPP	242.6	2.4 umPP	302.9	0.1 umPP	85.5	3.5 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-3Y	2010/10/21 01:14:51	91.0	43.0 umPP	-10.6 V	42.9 umPP	73.9	0.7 umPP	55.7	0.1 umPP	130.8	2.7 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-4X	2010/10/21 01:14:51	91.0	10.2 umPP	-10.0 V	9.5 umPP	134.1	2.2 umPP	320.1	0.1 umPP	86.8	3.0 umPP	0.0 umPP	0.0	0.0 umPP	0.0
1-4Y	2010/10/21 01:14:51	91.0	29.9 umPP	-10.4 V	29.6 umPP	94.6	1.5 umPP	38.3	0.3 umPP	132.7	2.9 umPP	0.0 umPP	0.0	0.0 umPP	0.0

Fig-7.13：Multi-variable trend displays

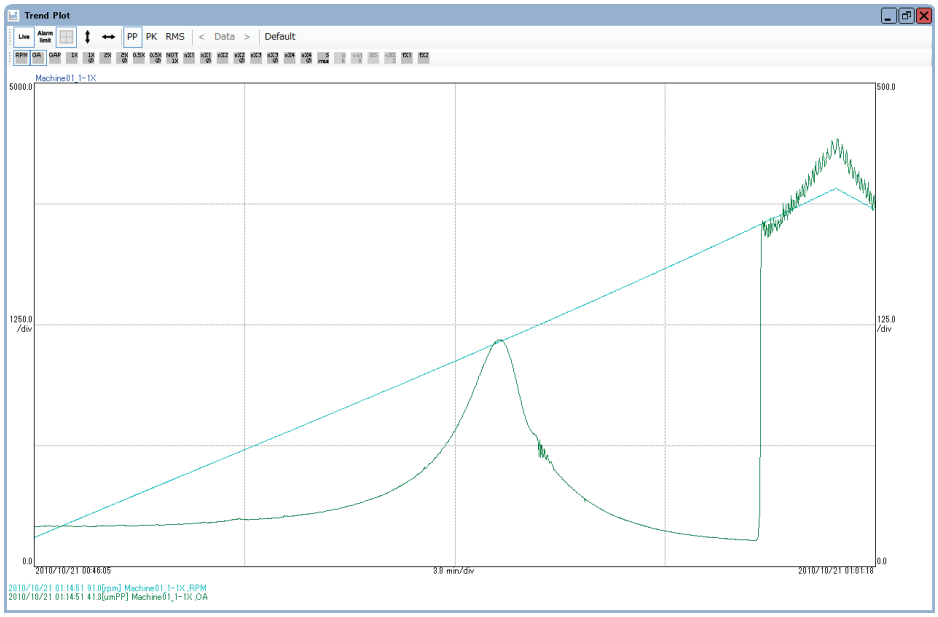
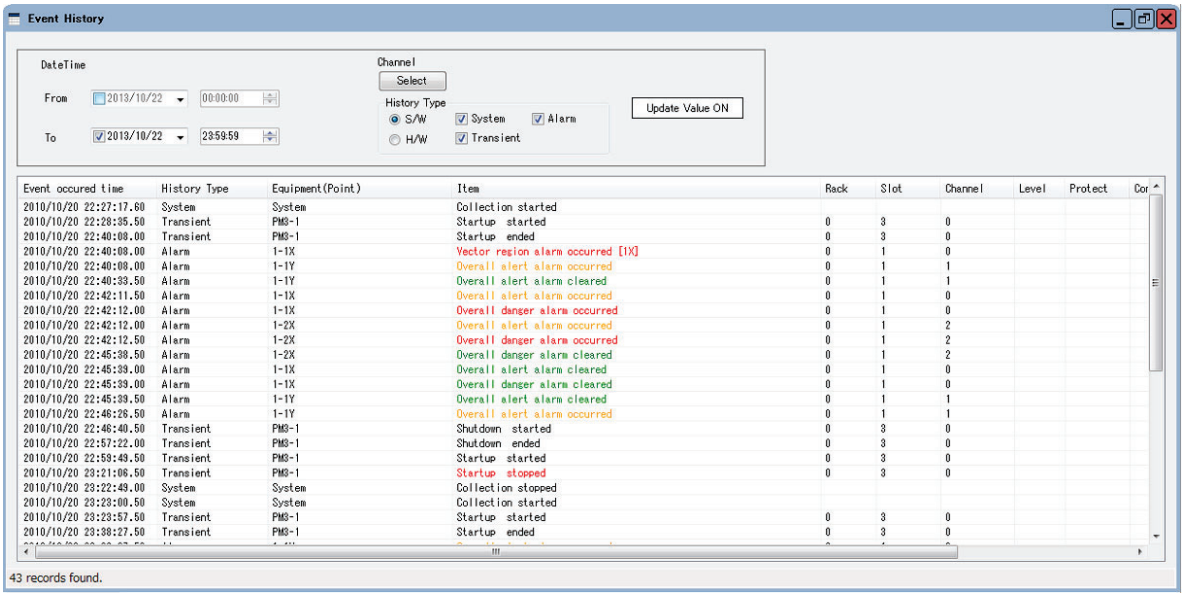


Fig-7.14：Time-stamped alarm list and system event list



7.3. Diagnostic function

When an abnormality symptom of vibration is detected, diagnosis function executes a presumption of fault cause.

(1) Diagnosis item

The diagnosis items are shown below.

- Rotor crack
- Rotor defect
- Unbalance
- Misalignment
- Oil whip
- Oil whirl

and others.

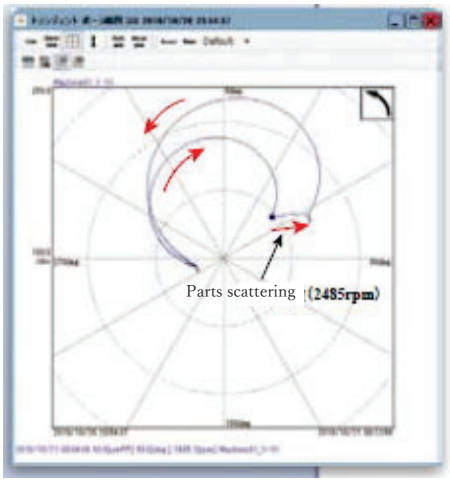
(2) Diagnosis process

The rule base including relation of vibration condition and turbine operating condition to diagnosis item is provided.
By checking up vibration condition and turbine operating condition with this rule base, fault cause is presumed.

Anomaly analysis example

- Rotor defect

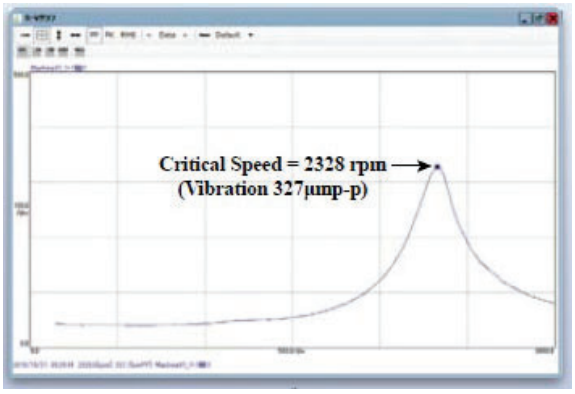
  At the same time as the parts that make up the rotating body scatter, the unbalanced vibration changes suddenly. At this time, the characteristics that the amplitude and phase angle (vibration vector) of the rotation synchronization frequency component (1X) suddenly change are analyzed.



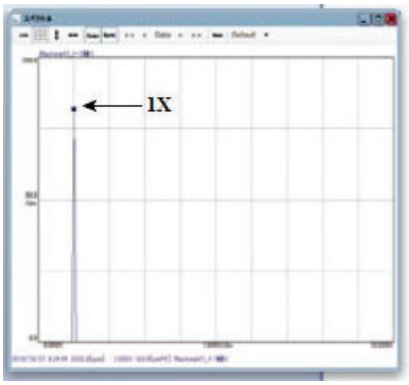
Polar plot

➢ Unbalance

Vibration occurs due to misalignment between the center of rotation of the rotating body and the center of rotation, or missing (scattering) of the parts that make up the rotating body. This vibration causes vibration of the rotation synchronous frequency component (1X), and there is little change in vibration value over time, and reproducible characteristics are analyzed.



S-V plot

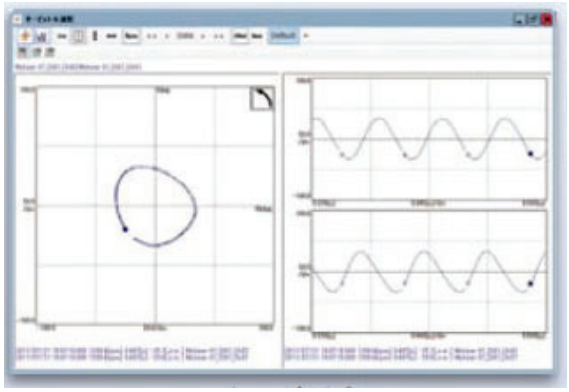


Spectrum plot

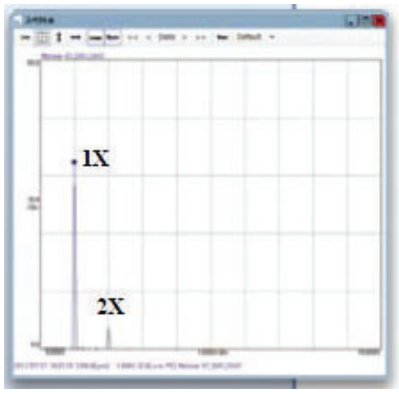
➢ Misalignment

When the shafts of the driven-side rotating machine and the driving-side rotating machine are connected, the center of each rotating shaft shifts, causing vibration. Analyze the characteristics of this vibration, which includes the harmonic component (2X, 3X) in addition to the rotation synchronous frequency component (1X).

【Normal】

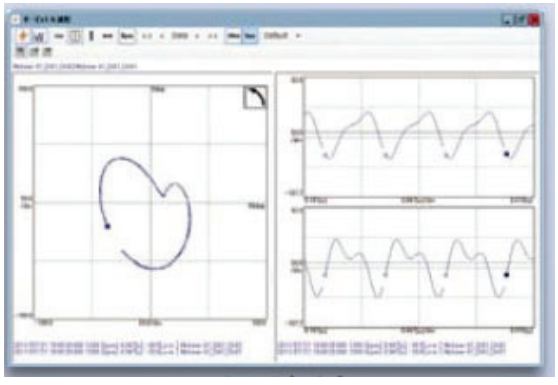


Orbit & Waveform plot

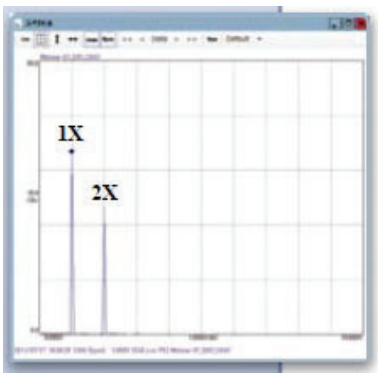


Spectrum plot

【When misalignment occurs】



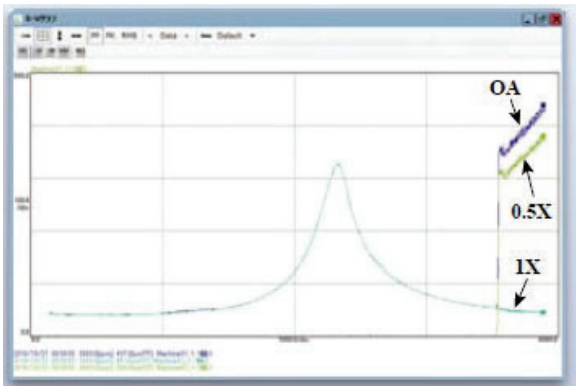
Orbit & Waveform plot



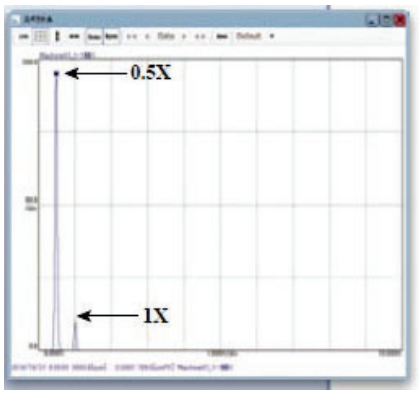
Spectrum plot

- Oil whirl

  This is a self-excited unstable vibration that is unique to rotating machinery supported by slide bearings, and is caused by the shape of the slide bearings and the oil film characteristics. This vibration is generated at a rotation speed that is less than twice the primary critical speed, and the characteristic that 1/2 frequency component (0.5X) of rotation synchronization is generated is analyzed.



S-V plot



Spectrum plot

8. Rack arrangement drawing (Lot2 portion)

Refer to next sheet.

Please refer to Lot1 and Lot3 reference document for detail specification of other object equipment.

VMAS PANEL *0CFA30
V-1:RACK-1 VM-761B

TAG NO.	V-1-P1 V-1-P2	V-1-C1 V-1-C2	V-1-0	V-1-1	V-1-2	V-1-3	V-1-4	V-1-5	V-1-6	V-1-7	V-1-8	V-1-9	V-1-10	V-1-11
	SLOT P1/P2	SLOT C1/C2	SLOT 0	SLOT 1	SLOT 2	SLOT 3	SLOT 4	SLOT 5	SLOT 6	SLOT 7	SLOT 8	SLOT 9	SLOT 10	SLOT 11
	POWER SUPPLY MODULE VM-751B1/ VM-754B2	HOST NETWORK COMMUNICATION MODULE VM-742B1/ VM-742B2	LOCAL COMMUNICATION & PHASE MARKER MODULE VM-741B	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY
CH 1	AC POWER SUPPLY AC230V 50Hz (PRIMARY)	TO DCS	BFPT-A PHASE MARKER	T-BFP A DE VIB-X	T-BFP A DE VIB-Y	M-BFP DE VIB-X	M-BFP DE VIB-Y	M-BFP M1 DE VIB-X	M-BFP M1 DE VIB-Y	M-BFP FLU CPL HOUS VIB INPUT SIDE	CEP A VIB-X	CEP A VIB-Y	CBP A DE VIB-X	CBP A DE VIB-Y
CH 2		TO VMAS SERVER	M-BFP PHASE MARKER	T-BFP A NDE VIB-X	T-BFP A NDE VIB-Y	M-BFP NDE VIB-X	M-BFP NDE VIB-Y	M-BFP M1 NDE VIB-X	M-BFP M1 NDE VIB-Y	M-BFP FLU CPL HOUS VIB PRM SIDE	T-BFP A GB VIB BP SIDE	T-BFP A GB VIB T-BFP SIDE	CBP A NDE VIB-X	CBP A NDE VIB-Y
CH 3	DC POWER SUPPLY DC220V (SECONDARY)	TO DCS	CEP A PHASE MARKER	T-BFP A BP DE VIB-X	T-BFP A BP DE VIB-Y	M-BFP BP DE VIB-X	M-BFP BP DE VIB-Y	M-BFP M2 DE VIB-X	M-BFP M2 DE VIB-Y	(SPARE)	CEP A MOT DE VIB-X	CEP A MOT DE VIB-Y	CBP A MOT DE VIB-X	CBP A MOT DE VIB-Y
CH 4			CBP A PHASE MARKER	T-BFP A BP NDE VIB-X	T-BFP A BP NDE VIB-Y	M-BFP BP NDE VIB-X	M-BFP BP NDE VIB-Y	M-BFP M2 NDE VIB-X	M-BFP M2 NDE VIB-Y	(SPARE)	CEP A MOT NDE VIB-X	CEP A MOT NDE VIB-Y	CBP A MOT NDE VIB-X	CBP A MOT NDE VIB-Y

VMAS PANEL *0CFA30
V-2:RACK-2 VM-761B

TAG NO.	V-2-P1 V-2-P2	V-2-C1 V-2-C2	V-2-0	V-2-1	V-2-2	V-2-3	V-2-4	V-2-5	V-2-6	V-2-7	V-2-8	V-2-9	V-2-10	V-2-11
	SLOT P1/P2	SLOT C1/C2	SLOT 0	SLOT 1	SLOT 2	SLOT 3	SLOT 4	SLOT 5	SLOT 6	SLOT 7	SLOT 8	SLOT 9	SLOT 10	SLOT 11
	POWER SUPPLY MODULE VM-751B1/ VM-754B2	HOST NETWORK COMMUNICATION MODULE VM-742B1/ VM-742B2	LOCAL COMMUNICATION & PHASE MARKER MODULE VM-741B	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VIBRATION・DISPLACEMENT MONITORING MODULE VM-701B /PM0/ALY	VZ-71	VZ-71	VZ-71	VZ-71	VZ-71
CH 1	AC POWER SUPPLY AC230V 50Hz (PRIMARY)	TO DCS	BFPT-B PHASE MARKER	T-BFP B DE VIB-X	T-BFP B DE VIB-Y	CEP B VIB-X	CEP B VIB-Y	CBP B DE VIB-X	CBP B DE VIB-Y	(SPARE)	(SPARE)	(SPARE)	(SPARE)	(SPARE)
CH 2		TO VMAS SERVER	CEP B PHASE MARKER	T-BFP B NDE VIB-X	T-BFP B NDE VIB-Y	T-BFP B GB VIB BP SIDE	T-BFP B GB VIB T-BFP SIDE	CBP B NDE VIB-X	CBP B NDE VIB-Y	(SPARE)	(SPARE)	(SPARE)	(SPARE)	(SPARE)
CH 3	DC POWER SUPPLY DC220V (SECONDARY)	TO DCS	CBP B PHASE MARKER	T-BFP B BP DE VIB-X	T-BFP B BP DE VIB-Y	CEP B MOT DE VIB-X	CEP B MOT DE VIB-Y	CBP B MOT DE VIB-X	CBP B MOT DE VIB-Y	(SPARE)	(SPARE)	(SPARE)	(SPARE)	(SPARE)
CH 4			(SPARE)	T-BFP B BP NDE VIB-X	T-BFP B BP NDE VIB-Y	CEP B MOT NDE VIB-X	CEP B MOT NDE VIB-Y	CBP B MOT NDE VIB-X	CBP B MOT NDE VIB-Y	(SPARE)	(SPARE)	(SPARE)	(SPARE)	(SPARE)

9. Detail Data Sheet (Lot2 portion)

Refer to next sheet.

Please refer to Lot1 and Lot3 reference document for detail specification of other object equipment.

FK SERIES
TRANSDUCER
SPECIFICATIONS

FK-202F TRANSDUCER

CE

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

FK-202F □ - □ - □ / EX □ / GEO

System cable length		Mounting plate		Terminal block		Intrinsically safe		Geothermal spec.
1	5m	1	DIN Rail(35mm) Mount	1	Screw type terminal block (M4)	1	TIIS (Ex ia IIC T4)	
2	9m	2	Screw mount (50.8×50.8mm)	2	Spring lock terminal	4	CSA C/US Class I, Division 1, Groups A,B,C and D Ex ia IIC T4 , AEx ia IIC T4	
		3	Screw mount (92×31mm: For VK replacement)			5	ATEX (Ex ia IIC T4 Ga)	
		4	Screw mount Multi-pitch (50.8×50.8mm and 92×31mm)			7	NEPSI (Ex ia IIC T4 Ga)	
						8	KTL (Ex ia IIC T4)	
						B	TS (Ex ia IIC T4 Ga)	
						C	TR-CU (Ex ia IIC T4 Ga X)	

*1 Above code shows model number of driver only. Refer to outline drawings for model number of sensor and extension cable.

SPECIFICATIONS

CALIBRATION MATERIAL	JIS SCM440 flat surface
MEASURING RANGE	0.25mm to 2.25mm from sensor tip
SENSITIVITY*2	7.87V/mm
SENSITIVITY ERROR*2	Within ±4%
SCALE FACTOR ERROR*2 (including interchangeability errors)	Within ±5% of 7.87V/mm (for 5m system) Within ±6.5% of 7.87V/mm (for 9m system) Step : 0.25mm, Linear range : 2mm
LINEARITY*2 (including interchangeability errors)	Within ±25μm of 7.87V/mm straight line : (for 5m system) Within ±38μm of 7.87V/mm straight line : (for 9m system) Linear range : 2mm
FREQUENCY RESPONCE*2	DC to 10kHz (-3dB)
MAX. IOUTPUT VOLTAGE*2	Approx. -23VDC
SENSOR ABNORMAL OUTPUT VOLTAGE*2	Approx. -0.6VDC (Sensor OPEN/Sensor SHORT)
OUTPUT IMPEDANCE*2	50Ω Current 5mA(max.)
CURRENT CONSUMPTION (10kΩ load)	Max. -15mA
OUTPUT NOISE*2	Approx. 15mVpk-pk + power supply noise
SENSOR TIP DIAMETER	Approx. 5mm or 8mm dia.
CABLE DIAMETER	Approx. 2.7mm or 3.6mm dia.
CONNECTOR DIAMETER	Approx. 7.1mm dia.

SYSTEM CABLE LENGTH	5m or 9m
OPERATING TEMPERATURE RANGE (Refer to NOTICE 8)	Sensor : -40 to +177°C Extension Cable : -40 to +177°C Driver : -40 to +80°C
RANGE OF TEMPERATURE AT EXPLOSION PROOF CONSTRUCTION	EX1,7 : -20 to +60°C(Sensor, Extension Cable & Driver) EX4 : -20 to +85°C(Sensor, Extension Cable & Driver) EX5,B : -38 to +80°C(Sensor, Extension Cable & Driver) EX8 : -35 to +80°C(Sensor, Extension Cable & Driver) EXC : -30 to +80°C(Sensor, Extension Cable & Driver)
TEMPERATURE CHARACTERISTIC	Sensor : Less than ±3% of F.S. Extension Cable : Less than ±4% of F.S. Condition : Gap=2mm, Target : JIS SCM440 0 to 80°C (at 20°C standard) Driver : Less than ±3% of F.S. Loop : Less than ±6% of F.S. Condition : Gap=2mm, Target : JIS SCM440 0 to 60°C (at 20°C standard)
OPERATING HUMIDITY RANGE	30 to 95% RH (non-condensing, non-submerged) (Sensor body : 100%RH)
POWER SUPPLY	-24VDC ± 10%
DIELECTRIC STRENGTH OF DRIVER	Between each terminals and mounting plate : 1mA or less at 500VAC for one minute
INSULATION RESISTANCE OF DRIVER	Between each terminals and mounting plate : 100MΩ or more at 500VDC
APPLICABLE WIRE SIZE	Screw type terminal block (M4) : 0.75 to 2mm^2 Spring lock terminal : 0.2 to 1.5mm^2
DRIVER MASS	Approx. 200g
Other	

*2 The above specification apply at 25°C with -24VDC power supply and load resistance 10kΩ and JIS SCM440 target (thickness≥5mm).

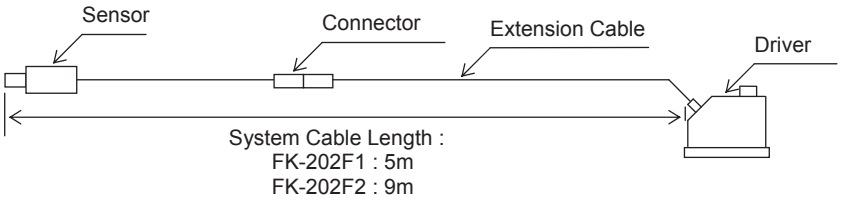
NOTICE

1. CALIBRATION MATERIAL
   MODEL FK-202F Transducers are calibrated for JIS SCM440 flat surface (more than 15mm dia.).
   If the measured target is other than JIS SCM440 flat surface, it will present a different characteristics. In such a case, calibration by the connected equipment (e.g. monitor) side should be required for system operation.
2. SHIELD WIRE CONNECTION
   Connect shield wire of signal cable (3-wire shielded cable between driver and monitor) to driver's "COM" terminal (Spring lock terminal: "Shield" terminal) and monitor's "COM" terminal.
   If this is not adhered to, noise may be caused.
3. CONNECTOR ISOLATION, etc.
   The connector connecting the sensor cable and the extension cable shall be insulated with the attached insulation sleeve (transparent shrink tube) or fluoro resin insulation tape.
   The vinyl-insulating tape shall not be used, which may cause the wiring trouble in the case of temperature more than 80°C.
   The connector shall not be located in the oil environment.
   The oil penetration to cable through the connector may cause the sensitivity change, due to the change of the cable capacitance.
4. MEGGER TEST OF SIGNAL CABLE
   If megger test is made on the signal cable (3-wire shielded cable), be sure to discharge the charged electric load before connecting the cable to driver.If this caution is not adhered the driver could be dameged.
5. SENSOR INSTALLATION
   Not available for rain water at out door use.
   It may cause the sensitivity change and insulation down.
6. SCALE FACTOR ERROR and LINEARITY
   The scale factor error margin and linearity margin provides for examination result in our factory.
   This regulated value is not applied to the examination result in the site.
7. SAFETY BARRIER
   In case of the intrinsically safe specification, the approved following safety barrier is recommended.
   • MTL 7796-
   Linear range reduces when intrinsic safety system with barrier.(to approx. 95%)
8. OPERATING TEMPERATURE RANGE OF CONNECTOR
   The operating temperature (upper limit) for connectors of the sensors and the extension cables shipped on July 31, 2011 or earlier is 125 ℃.
   If you are unsure of the operating temperature of your connector please contact us.
9. The instructions manual contains important information such as conditions necessary for safe handling of the system.
   Such information and conditions are important and indispensable for ensuring safety. Therefore, be sure to read the instructions manual thoroughly before handling the system.
10. Cable length 5.0m sensor is designed for 5m system only.
    Can not use for 9m system.

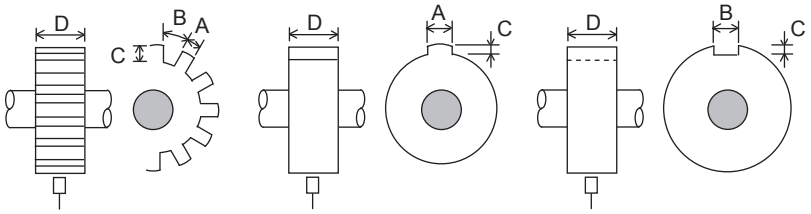
FK SERIES
TRANSDUCER
SPECIFICATIONS

FK-202F TRANSDUCER

CONFIGURATION



• Dimension of target [recommended for rotational speed measurement]



Dimension of Target [recommended] (mm)	A ≥ 6
	B ≥ 7
	C ≥ 2.5
	D ≥16
Set gap [recommended] (mm)	1.0 to 1.5

CB-101 Series Vibration Sensor

2 Pin MS Connector, 100mV/g Industrial Accelerometer

PRODUCT DATA

Typical Applications

- Proven use in vibration monitoring for offline applications using commercially available data collectors and online monitoring systems in the fields of Building Services, Civil Engineering, Paper and Pulp, Mining, Metals Manufacture, Utilities, Automotive, Water and Waste Treatment, Pharmaceutical, Aerospace, etc.
- **Protecting...**
  Fans, Motors, Pumps, Compressors, Centrifuges, Conveyers, Air Handlers, Gearboxes, Rolls, Dryers, Presses, Cooling, HVAC, Spindles, Machine Tooling, Process Equipment and many more.

Technical Performance

Mounted Base Resonance	22 kHz (nominal)
Sensitivity	100 mV/g ±10% Nominal 80 Hz at 22 °C
Frequency Response	2 Hz to 10 kHz ±5 % 0.8 Hz to 15 kHz ±3 dB
Isolation	Base isolated
Measurement Range	±80 g
Transverse Sensitivity	Less than 5%

Electrical

Electrical Noise	0.1 mg max
Current Range	0.5 mA to 8 mA
Bias Voltage	10 - 12 Volts DC
Settling Time	2 seconds
Output Impedance	200 Ohms max.
Case Isolation	$>10^8$ Ohms at 500 Volts

Environmental

Operating Temperature Range	-55 to 140 °C
Sealing	IP67
Maximum Shock	5000 g
Emissions	EN61000-6-4:2001
Immunity	EN61000-6-2:1999

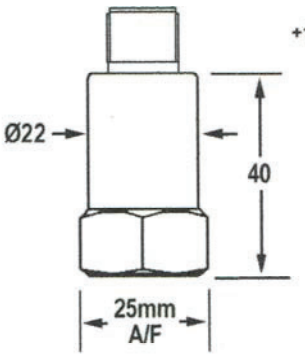
Mechanical

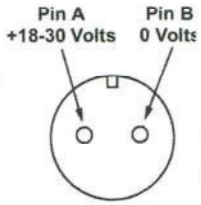
Case Material	Stainless Steel
Sensing Element/Construction	PZT/Compression
Mounting Torque	8 Nm
Weight	110 gms (nom)
Maximum Cable length	1000 metres
Mounting Threads	See 'How to order' table
Options	Integral cable, filters, temperature output, various connector assemblies, other sensitivities

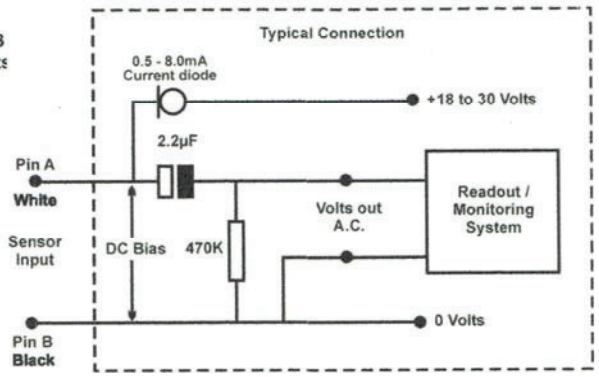
SHINKAWA

CB-101 Series Vibration Sensor

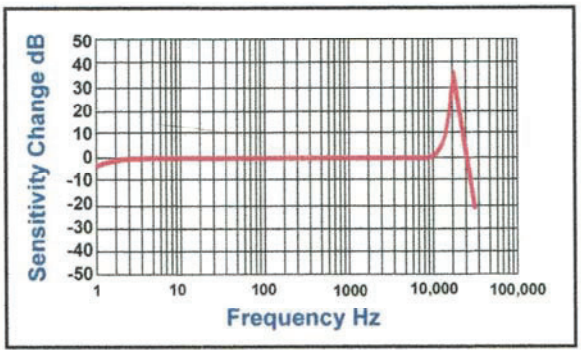
Dimensions



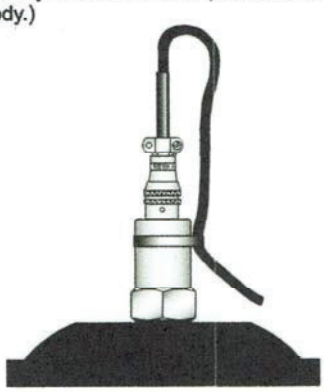




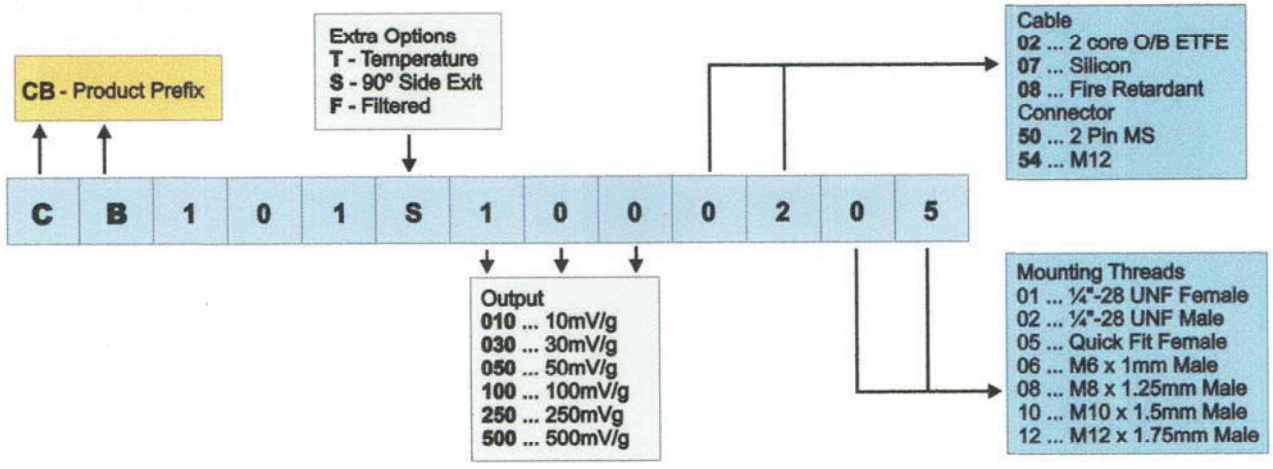
Frequency Response



Mounting of sensor to achieve good repeatable readings.
Vibration sensor should be firmly fixed to a flat surface (spot face surface may be needed to be produced and cable anchored to sensor body.)



How to order



Please contact our Sales Office for information on sensor accessories (mounting studs, etc) and multichannel switch boxes.

Ref: HS1002P-1208

SHINKAWA Electric Co., Ltd.
3rd Fl. Shin-kojimachi Bldg. 3-3 Kojimachi 4-chome, Chiyoda-ku
Tokyo 102-0083, Japan
Tel : 81-3-3263-4417 Fax : 81-3262-2171 E-mail : st-mkt@shinkawa.co.jp
http://www.shinkawaelectric.com/en

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

VM-701B /PM☐ /AL☐

Phase Marker Function		Analysis Function	
0	Without	0	Without
1	With (When "/ALY" is requested)	Y	With

~~/NB1~~ /CS1 /CS2 ~~/TRP~~ /TB☐

~~Non-incendive~~		Monitor Function	Analysis Function	Tropical spec.	I/O terminal block for	
~~1~~	~~Class I Division 2 CSA~~	Custom setup	Custom setup (When "/ALY" is requested)		1	VM-761B instrument rack
					2	VM-762B instrument rack

*1 Please check the input rated power of the rack. Refer to the specification sheet, "VM-75☐B POWER SUPPLY MODULE (Specification No. 31109E1.1 or later).

Specification

INPUT (VIBRATION/DISPLACEMENT)

Input points : 4point
Input impedance : Approx. 50kΩ
(Current signal input: Approx. 250Ω)

INPUT TRANSDUCER (VIBRATION/DISPLACEMENT)

Displacement vibration input : FK-202F, FK-452F, FK-302F, VK-202A, VK-452A, VK-202P, VK-302P, VC-020
Velocity vibration input : CV-88, CV-87, CV-86
Acceleration vibration input : CA-302, CA-72
Displacement input : FK-202F, FK-452F, FK-302F, FK-602F, FK-143F, FK-263F
VK-202A, VK-452A, VK-302P, VK-602P, VK-143P, VK-263P, VC-253
Other input : VM-21P
Voltage signal (Input range:-10V to +10V)
Current signal (Input range:4mA to 20mA)

INPUT (Phase Marker) (When "/PM1" is requested)

Input point (tachometer) : 1point
Input impedance : 50kΩ
Input voltage range : Less than 50Vp-p
Min. pulse width : 50μsec
Hysterics set value : 1V, 2V, 5V
Maximum rotation speed : 60,000rpm

INPUT TRANSDUCER (Phase Marker) (When "/PM1" is requested)

Proximity transducer : FK-202F
RD-05A

SYNCHRONIZED SIGNAL SOURCE

Another VM-701B or VM-706B : input via transducer input terminal.
VM-741B : input via internal mother board.

OTHERS

OUTPUT

Indicators : OK LED (Green)
When channel is normal : ON, When alarming : Flashing
TRG LED (Yellow)
When rotational pulse is not detected : ON
When rotational pulse is detected : Flashing

Monitor output : Input signal is output via buffer amplifier.
Location : BNC (Front) and connector (Back)
Output impedance : Approx. 100Ω (Max.5mA)

Pulse output (When "/PM1" is requested) : Shaped pulse signal is output via a buffer amplifier.
Location : BNC (Front)
Output impedance : Approx. 100Ω (Max. 5mA)
Signal level : 0V (V_{OL}), 5V (V_{OH})

Synchronized signal output
: Shaped pulse signal is output via a buffer amplifier.
Location : Terminal (Back)
VM-761B : D5/D6
VM-762B : 15pin D-SUB 13, 14
Output impedance : Approx. 100Ω (Max.5mA)
Signal level : 0V (V_{OL}), 5V (V_{OH})

Recorder output : Voltage or current output proportional to measurement value.
Measurement value of each channel can be assigned to any output channel of its own module.
Number of output points : 4 points.
Output range : 1 to 5V, 4 to 20mA,
0 to 5V, 0 to 10V
I/O conversion accuracy : ±1% of F.S. at 25°C*2
±2% of F.S. at 0°C to 65°C *2
Max. load resistance: 600Ω (current mood)
Output impedance: Approx. 500Ω (voltage mood)
Insulation resistance: 10MΩ at 100VDC
Burnout function: Downscale 0%
Downscale 0mA / 0mV

Transducer power supply :
Proximity transducer : -24VDC±10% / 25mA Max.
Piezoelectric transducer : +24VDC±10% / 4mA (constant current)

Contact output :
Number of relay : 6 points (logic changeable)
Contact type : Dry contact (SPDT)
Energization method
: Normally de-energized or
Normally energized field changeable.
Contact capacity : 250VAC/5A, 30VDC/5A

Output to analysis software (When "/ALY" is requested)
Dynamic data : Synchronous waveform, Asynchronous waveform
Static data : Amplitude (0.5X, 1X, 2X, nX (n=0.01 to 8.00), Not-1X,$S_{(p-p)\,max}$)
Phase (0.5X, 1X, 2X, nX (n=0.01 to 8.00))
Rotation speed
Refer to the specification sheet of VM-773B infiSYS ANALYSIS VIEW.

Note) *2 At calibrate frequency.

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Specification

ALARM

Alarm set point : Vibration monitoring
2 points (DANGER, ALERT), from 0 to 100% of monitor range, field changeable
Displacement monitoring
4 points (H-DANGER, H-ALERT, L-DANGER, L-ALERT), from -50% to +50% of monitor range, field changeable
Alarm set accuracy : Vibration, Displacement
±(0.2% of F.S.+1digit) or less at 25°C
Alarm set repeatability : ±1digit or less at 25°C
Alarm delay time : 0 to 99sec (0.1 sec step, field changeable)
Alarm reset : AUTO-RESET or SELF-HOLD field changeable.
Alarm bypass function : Block off alarm output (DANGER)

VIBRATION (OVER ALL) MONITORING

Rectification : Root Mean Square (RMS)
Peak-to-Peak (p-p)
Peak-to-Peak (p-p) rectification for low speed

Note)
- Rectification is calculation method to convert vibration waveform to amplitude which may be different from monitor range scale.
（Ex. p-p conversion scale by RMS rectification）
- Refer to Table1 for rectification selection.
- The peak rectification is recommended when high speed response time and true p-p rectification are preferred. The RMS rectification is recommended when noise resistance or runout inhibition are preferred.

(○:YES ×:NO)

Transducer	Monitor Range (Parameter)	Rectification		
		RMS	p-p	p-p rectification for low speed
Displacement (VK, FK)	Displacement Vibration (p-p)	○	○	○
Velocity (CV)	Displacement Vibration (p-p)	○	○	×
	Velocity Vibration (rms)	○	×	×
	Velocity Vibration (peak)	○	×	×
Acceleration (CA)	Velocity Vibration (rms)	○	×	×
	Velocity Vibration (peak)	○	×	×
	Acceleration Vibration (rms)	○	×	×
	Acceleration Vibration (peak)	○	×	×

Table 1 Selection table for rectification

Root Mean Square (RMS)
Recommend monitoring range : 100 to 1000μm, 10 to 100mm/s, 1 to 20g
Accuracy : ±1% of F.S. at 25°C*3
±2% of F.S. at 0°C to 65°C*3
HPF : 2Hz to 1kHz (-3dB)*3 (4 pole)
9.5Hz to 100Hz (-3dB)*4 (10 pole)
LPF : 200Hz to 10kHz (-3dB)*4 (4 pole)

Peak-to-Peak (p-p)
Recommend monitoring range : 100 to 1000μm
Accuracy : ±1% of F.S. at 25°C*3
±2% of F.S. at 0°C to 65°C*3
HPF : 2Hz to 100Hz (-3dB)*4 (2 pole)
9.5Hz to 100Hz (-3dB)*4 (10 pole)
LPF : 500Hz to 1kHz (-3dB)*4 (4 pole)

Note) *3 At calibrate frequency.
*4 There is un-match combination.
(See “Vibration (Over All) Monitoring (Selection Table for Filter Set Value P.6, 7”.)

Peak-to-Peak (p-p) rectification for low speed
Recommend monitoring range : 100 to 1000μm
Accuracy : ±3% of F.S. at 2Hz at 25°C
HPF : 0.2Hz (-3dB), (1 pole)
9.5Hz to 100Hz (-3dB) (10 pole)
LPF : 500Hz to 1kHz (-3dB), (4 pole)

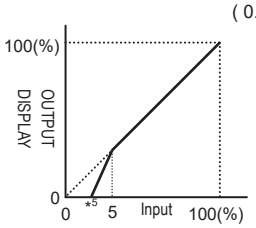
Note)
- Applicable, only for displacement transducer input and displacement vibration measurement.
- Basically, phase marker signal are required. When no phase marker signal is input, rise time speed may be deteriorate at normal speed range.
- Standard high-pass filter (4 pole, 2 pole) cannot be selected.
(See “Vibration (Over All) Monitoring (Selection Table for Filter Set Value P.6, 7”.)

VIBRATION (OVER ALL) MONITORING

Sequence function : Used to prevent alarm output that is caused by excessive vibration during machine startup. Block off the DANGER/ALERT alarm, or switch the alarm setup value to another number magnified by setup number.
Sequence Setup :Block off
1 to 10 (0.1 step, field changeable)

⚠ WARNING
In case the SEQ. magnification number is setup from 2 to 10, the alarm setup value magnified by setup number while the SEQ. circuit is in progress should stay at or lower than 110% of the maximum monitor range. If the number is more than 110% of the monitor range the alarm may not output.

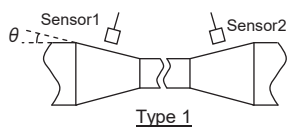
Suppression function
: If the vibration value is less than the setup value, this function is forced to suppress the measured vibration value and recorder output.
*5 Suppression Setup Value: 0 to 5%
(0.1% step, field changeable)



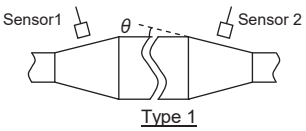
Input/Output characteristic

DISPLACEMENT MONITORING

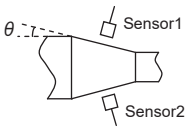
Accuracy : ±1% of F.S. at 25°C
±2% of F.S. at 0°C to 65°C
Frequency response : Approx. 0.5Hz (-3dB)
Zero shift function : -50 to +50% of monitor range
Lamp angle (θ) : 4 to 90 degree



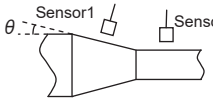
Type 1



Type 1



Type 2



Type 3

Operation function : Addition/Subtraction
Ch1 + Ch2, Ch2 + Ch3, Ch3 + Ch4
Ch1 - Ch2, Ch2 - Ch3, Ch3 - Ch4

Note)
- When this monitor is used for intrinsically safe explosion proof construction, the OK alarm set point may fall within the range, depending on the input transducer and the specified monitoring range.

ANALYSIS FUNCTION (When “/ALY” is requested)

Amplitude accuracy : Overall 0.5X, 1X, 2X, nX (n=0.01 to 10.00), Not-1X : ±3% of F.S. at 25°C
±5% of F.S. at 0°C to 65°C
(for machine speed less than 30000 r/min)
$S_{(p\text{-}p)\,max}$: ±5% of F.S. at 25°C
±7% of F.S. at 0°C to 65°C

Phase accuracy : 0.5X, 1X, 2X : ±3 deg of rdg. at 25°C
±6 deg of rdg. at 0°C to 65°C

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Specification

ENVIRONMENTAL CONDITION

Operating temperature: 0 to +65°C
Storage temperature : -30 to +85°C
Relative humidity : 20 to 95%RH (non-condensing)

POWER CONSUMPTION

Module : Less than 15W

MATERIAL AND FINISH

Face plate : ABS (Black)
Sheet : Polyester tough top (Gray)
Base plate : Alminium alloy (Silver)

MASS

Body : Max. 1.0kg (2.2lb)

ACCESSORY SPECIFICATION CODE/IDENTIFIED BY TB☐

Code	Accessory	Quantity (Part Code)
/TB1	Transducer input terminal block plug (15pin) FRONT-MC-1.5/15-STF-3.81 (PHOENIX CONTACT)	2pieces*7 (7072NAB)
	Recorder output terminal block plug (6pin) FRONT-MC-1.5/6-STF-3.81 (PHOENIX CONTACT)	2pieces*7 (7072NAC)
	Contact output terminal block plug (18pin) FRONT-MC-1.5/18-STF-3.81 (PHOENIX CONTACT)	1piece (7072NAA)
/TB2	Contact output terminal block plug (18pin) FRONT-MC-1.5/18-STF-3.81 (PHOENIX CONTACT)	1piece (7072NAA)

Note) *6 D-sub plugs and hoods are not included in this code. Please make necessary arrangement separately, if required.

*7 When individually ordering specify the parts code, it is require to arrange for a necessary amount.

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

Default Value

INPUT (VIBRATION/DISPLACEMENT)

Monitoring : Vibration monitor (Displacement vibration input)
Monitor range : 0 to 100μm p-p
Input transducer : FK-202F (non-intrinsic safety)
Input points : 4points
Input impedance : 50kΩ

INPUT (PHASE MARKER) (When "/PM1" is requested)

Input transducer : RD-05A
Pulse polarity : Positive
Hysterics set value : 1V
Trigger level : -18V

RECTIFICATION

Rectification : Root Mean Square (RMS)

FILTERING

Low cut-off frequency : 5Hz (4 pole)
High cut-off frequency : 4kHz

ALARM

DANGER set point : 80μm
ALERT set point : 60μm
OK set point (Vibration/Displacement)
: -1.4V (Low), -18.8V (High)
OK set point (Phase Marker) (When "/PM1" is requested)
: -1.4V (Low)
Alarm delay time : 3sec (DANGER, ALERT)
Alarm reset : AUTO-RESET

RECORDER OUTPUT

Output range : 4 to 20mA (4mA at the burnout)

CONTACT OUTPUT

Contact (RELAY1) : OR logic (DANGER-1 / DANGER-2)
Contact (RELAY2) : OR logic (ALERT-1 / ALERT-2)
Contact (RELAY3) : OR logic (NOT-OK-1 / NOT-OK-2)
Contact (RELAY4) : OR logic (DANGER-3 / DANGER-4)
Contact (RELAY5) : OR logic (ALERT-3 / ALERT-4)
Contact (RELAY6) : OR logic (NOT-OK-3 / NOT-OK-4)
Energization method : Nomally de-energized

OTHERS

Sequnce set value : 1
Suppression set value : 0%
First out : OFF
Timed OK channel defeat : ON
Burnout : Downscale 0%

OTHERS

Alarm Contact Operation

Contact type	Energization method	Power OFF	Power ON	
			Normal state	Alarm state
N.O. contact	NORMALLY DE-ENERGIZED	OPEN	OPEN	CLOSE
	NORMALLY ENERGIZED	OPEN	CLOSE	OPEN
N.C. contact	NORMALLY DE-ENERGIZED	CLOSE	CLOSE	OPEN
	NORMALLY ENERGIZED	CLOSE	OPEN	CLOSE

VM-7
MONITORING SYSTEM

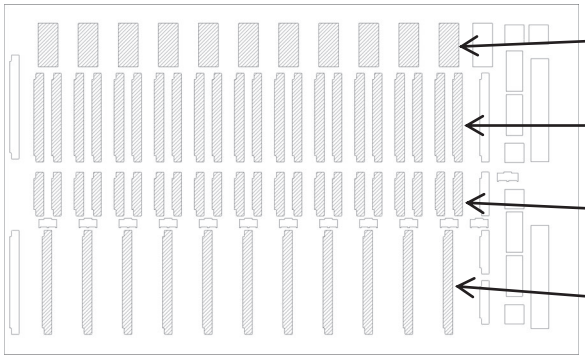
SPECIFICATIONS

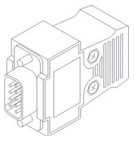
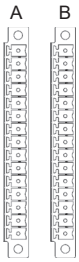
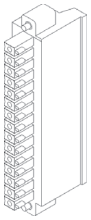
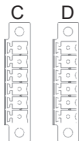
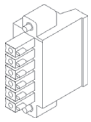
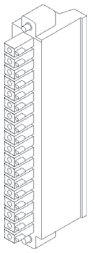
VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Plug/ Terminal Block (Connector) Pin Assignment

VM-761B Instrument Rack
(Back)



	Back of Instrument Rack	Plug/Terminal Block (Connector) Pin Assignment	Fitting Plug	Part Code
①		1 CH1 MON, 2 CH1 COM, 3 CH2 MON, 4 CH2 COM, 5 N/A; 6 CH3 MON, 7 CH3 COM, 8 CH3 MON, 9 CH4 COM		Plug 7072NAD Hood 7072NAG
②		A1 CH1 SIG, A2 CH1 COM, A3 N/A, A4 CH1 POW, A5 CH1 SHIELD, A6 CH2 SIG, A7 CH2 COM, A8 N/A, A9 CH2 POW, A10 CH2 SHIELD, A11 CH3 SIG, A12 CH3 COM, A13 N/A, A14 CH3 POW, A15 CH3 SHIELD; B1 CH4 SIG, B2 CH4 COM, B3 N/A, B4 CH4 POW, B5 CH4 SHIELD, B6 Φ SIG, B7 Φ COM, B8 N/A, B9 Φ POW, B10 Φ SHIELD, B11 PUL SIG, B12 PUL COM, B13 N/A, B14 N/A, B15 PUL SHIELD		Note2) 7072NAB
③		C1 REC1 +, C2 REC1 -, C3 REC2 +, C4 REC2 -, C5 REC3 +, C6 REC3 -; D1 REC4 +, D2 REC4 -, D3 N/A, D4 N/A, D5 PUL OUT, D6 PUL COM		Note2) 7072NAC
④		E1 RL1 N.O., E2 RL1 COM, E3 RL1 N.C., E4 RL2 N.O., E5 RL2 COM, E6 RL2 N.C., E7 RL3 N.O., E8 RL3 COM, E9 RL3 N.C.; E10 RL4 N.O., E11 RL4 COM, E12 RL4 N.C., E13 RL5 N.O., E14 RL5 COM, E15 RL5 N.C., E16 RL6 N.O., E17 RL6 COM, E18 RL6 N.C.		7072NAA

Note1) For the accessory specification code “/TB1”, the fitting terminal block plugs ②③④ are included. For the accessory specification code “/TB1”, the D-sub plug and hood ① are not included. If required, please make necessary arrangement separately referring to the part code above.

Note2) When individually ordering specify the parts code, it is require to arrange for a necessary amount.

VM-7
MONITORING SYSTEM

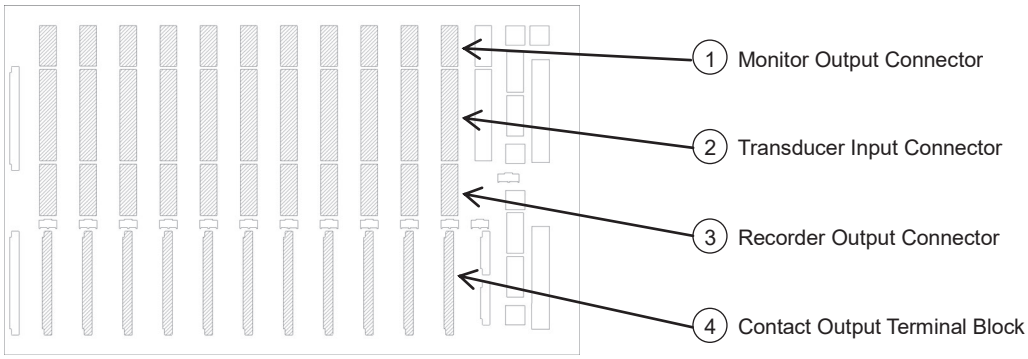
SPECIFICATIONS

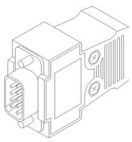
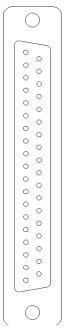
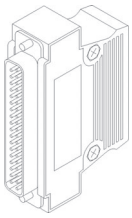
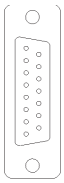
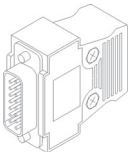
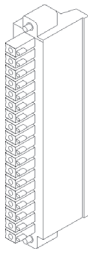
VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Plug/ Terminal Block (Connector) Pin Assignment

VM-762B Instrument Rack
(Back)



	Back of Instrument Rack	Plug/Terminal Block (Connector) Pin Assignment	Fitting Plug	Part Code
①		1 CH1 MON, 2 CH1 COM, 3 CH2 MON, 4 CH2 COM, 5 N/A; 6 CH3 MON, 7 CH3 COM, 8 CH4 MON, 9 CH4 COM		Plug 7072NAD Hood 7072NAG
②	A 	A1 CH1 IN, A2 CH1 COM, A3 N/A, A4 CH1 POW, A5 CH1 SLD, A6 CH2 IN, A7 CH2 COM, A8 N/A, A9 CH2 POW, A10 CH2 SLD, A11 CH3 IN, A12 CH3 COM, A13 N/A, A14 CH3 POW, A15 CH3 SLD, A16 N/A, A17 N/A, A18 N/A, A19 N/A; A20 CH4 IN, A21 CH4 COM, A22 N/A, A23 CH4 POW, A24 CH4 SLD, A25 Φ IN, A26 Φ COM, A27 N/A, A28 Φ POW, A29 Φ SLD, A30 PUL IN, A31 PUL COM, A32 N/A, A33 N/A, A34 PUL SLD, A35 N/A, A36 N/A, A37 N/A		Plug 7072NAF Hood 7072NAJ
③	C 	C1 REC1 +, C2 REC1 -, C3 REC2 +, C4 REC2 -, C5 REC3 +, C6 REC3 -, C7 N/A, C8 N/A; C9 REC4 +, C10 REC4 -, C11 N/A, C12 N/A, C13 PUL OUT, C14 PUL COM, C15 N/A		Plug 7072NAE Hood 7072NAH
④	E 	E1 RL1 N.O., E2 RL1 COM, E3 RL1 N.C., E4 RL2 N.O., E5 RL2 COM, E6 RL2 N.C., E7 RL3 N.O., E8 RL3 COM, E9 RL3 N.C.; E10 RL4 N.O., E11 RL4 COM, E12 RL4 N.C., E13 RL5 N.O., E14 RL5 COM, E15 RL5 N.C., E16 RL6 N.O., E17 RL6 COM, E18 RL6 N.C.		7072NAA

Note) For the accessory specification code “/TB2”, the fitting terminal block plug ④ is included.
For the accessory specification code “/TB2”, the D-sub plugs and hoods ①②③ are not included.
If required, please make necessary arrangement separately referring to the part code above.

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Vibration (Over All) Monitoring (Selection Table for Filter Set Value)

Root Mean Square (RMS)

(O:YES ×:NO)

		HPF <4 pole>												
		2Hz	5Hz	10Hz	20Hz	25Hz	30Hz	40Hz	50Hz	60Hz	100Hz	300Hz	500Hz	1000Hz
LPF	200Hz	O	O	O	O	×	×	×	×	×	×	×	×	×
	300Hz	O	O	O	O	O	O	×	×	×	×	×	×	×
	400Hz	O	O	O	O	O	O	O	×	×	×	×	×	×
	500Hz	O	O	O	O	O	O	O	O	×	×	×	×	×
	600Hz	O	O	O	O	O	O	O	O	O	×	×	×	×
	800Hz	O	O	O	O	O	O	O	O	O	×	×	×	×
	1000Hz	O	O	O	O	O	O	O	O	O	O	×	×	×
	2000Hz	×	O	O	O	O	O	O	O	O	O	×	×	×
	3000Hz	×	O	O	O	O	O	O	O	O	O	O	×	×
	4000Hz	×	O	O	O	O	O	O	O	O	O	O	×	×
	5000Hz	×	O	O	O	O	O	O	O	O	O	O	O	×
	6000Hz	×	×	O	O	O	O	O	O	O	O	O	O	×
	8000Hz	×	×	O	O	O	O	O	O	O	O	O	O	×
	10000Hz	×	×	O	O	O	O	O	O	O	O	O	O	O

		HPF <10 pole>						
		9.5Hz	12Hz	14Hz	15Hz	40Hz	60Hz	100Hz
LPF	200Hz	O	O	O	O	×	×	×
	300Hz	O	O	O	O	×	×	×
	400Hz	O	O	O	O	O	×	×
	500Hz	O	O	O	O	O	×	×
	600Hz	O	O	O	O	O	O	×
	800Hz	O	O	O	O	O	O	×
	1000Hz	O	O	O	O	O	O	O
	2000Hz	O	O	O	O	O	O	O
	3000Hz	O	O	O	O	O	O	O
	4000Hz	O	O	O	O	O	O	O
	5000Hz	O	O	O	O	O	O	O
	6000Hz	×	×	O	O	O	O	O
	8000Hz	×	×	O	O	O	O	O
	10000Hz	×	×	O	O	O	O	O

OTHERS

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-701B VIBRATION / DISPLACEMENT MONITOR MODULE

CE

Vibration (Over All) Monitoring (Selection Table for Filter Set Value)

Peak-to-Peak (p-p)

(O:YES ×:NO)

		HPF <2 pole>									
		2Hz	5Hz	10Hz	20Hz	25Hz	30Hz	40Hz	50Hz	60Hz	100Hz
LPF	500Hz	O	O	O	O	O	O	O	O	×	×
	600Hz	O	O	O	O	O	O	O	O	O	×
	800Hz	O	O	O	O	O	O	O	O	O	×
	1000Hz	O	O	O	O	O	O	O	O	O	O

		HPF <10 pole>						
		9.5Hz	12Hz	14Hz	15Hz	40Hz	60Hz	100Hz
LPF	500Hz	O	O	O	O	O	×	×
	600Hz	O	O	O	O	O	O	×
	800Hz	O	O	O	O	O	O	×
	1000Hz	O	O	O	O	O	O	O

Peak-to-Peak (p-p) rectification for low speed

		HPF <1 pole>
		0.2Hz
LPF	500Hz	O
	600Hz	O
	800Hz	O
	1000Hz	O

		HPF <10 pole>						
		9.5Hz	12Hz	14Hz	15Hz	40Hz	60Hz	100Hz
LPF	500Hz	O	O	O	O	O	×	×
	600Hz	O	O	O	O	O	O	×
	800Hz	O	O	O	O	O	O	×
	1000Hz	O	O	O	O	O	O	O

OTHERS

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-741B LOCAL COMMUNICATION & PHASE MARKER MODULE

CE

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

【When "Security function" is not selected】

VM-741B /MEM /~~NB1~~ /CSU /~~TRP~~ /TB□

EVENT HISTORY BACKUP	Non-incendive	Custom setup	Tropical spec.	I/O terminal block for:
	1 Class I Division 2 CSA			1 VM-761B instrument rack
				2 VM-762B instrument rack

【~~When "Security function" is selected~~】

VM-741B2 /MEM /NB1 /CSU /TRP /TB□

Security Function*1	EVENT HISTORY BACKUP	Non-incendive	Custom setup	Tropical spec.	I/O terminal block for:
2 Available (Achilles Certificate Level2)		1 Class I Division 2 CSA			1 VM-761B instrument rack
					2 VM-762B instrument rack

Specification

PHASE MARKER INPUT

- Input points (tachometer) : 4 points
- Input Impedance : 50kΩ
- Input voltage range : Less than 50Vp-p
- Hysteresis : 1V, 2V, 5V
- Maximum rotation speed : 60,000rpm

PHASE MARKER INPUT TRANSDUCER

- Proximity transducer : FK-202F, RD-05A

OPERATION CONTACT INPUT

- RES : Outside reset signal
- SEQ : Sequence signal
- FIL : Filter enable signal

OUTPUT

Indicators : DAN LED (Red)
- On : When DANGER alarm occurs (This indicator lights up when DANGER alarm is output from at least one of the modules stored in the instrument rack .)
- Off : During normal status

ALT LED (Yellow)
- On : When ALERT Alarm occur (This indicator lights up when ALERT alarm is output from at least one of the modules stored in the instrument rack .)
- Off : During normal status

SYS-OK LED (Green)
- On : During normal status
- Flash : When OK alarm occurs (This indicator flashes when an input abnormality of the phase marker signal is output or an OK alarm is output within the rack.)

D-BYP LED (Red)
- On : While the DANGER bypass is set
- Off : During normal status

COMM LED (Green)
- On : Communication is connected
- Flash : Communication data is being passed
- Off : Communication is disconnected

TRG LED (Yellow)
- On : A phase marker pulse is not detected
- Flash : A phase marker pulse is detected

OUTPUT

Monitor output : Input signal is output via a buffer amplifier
- Location : BNC (Front) and connector (Back)
- Output Impedance : Approx. 100Ω
- Output current : Max. 5mA

Pulse output : Shaped pulse signal is output via a buffer amplifier.
- Location : BNC (Front)
- Signal waveform : 0V (V_{OL}), 5V (V_{OH})
- Output Impedance : Approx. 100Ω
- Output current : Max. 5mA

Transducer power supply : proximity transducer -24VDC±10% / 25mA Max.

Contact output : SYS-OK
- Output points : 1
- Contact type : Dry contact (SPDT)
- Enagization method : Normally de-energized or Normally energized field changeable
- Contact capacity : 250VAC/5A, 30VDC/5A

ALARM

- Alarm reset : AUTO-RESET or SELF-HOLD field changeable.

PROGRAMMABLE INDICATOR COMMUNICATION

- Network : RS-485
- Protocol : Modbus/RTU
- Connector : 5-pin connector (Back side of rack)

MCL VIEW (VM-771B) COMMUNICATION

- Network : Ethernet 100Base-TX
- Protocol : TCP/IP
- Connector : RJ-45 (Back side of rack)

DEVICE CONFIG (VM-772B) COMMUNICATION

- Network : USB 2.0/1.1
- Connector : Type-B (Front side of rack)

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-741B LOCAL COMMUNICATION & PHASE MARKER MODULE

CE

Specification

SECURITY FUNCTION*1

Network	: Ethernet 100Base-TX
Protocol	: TCP/IP
Connector	: RJ-45(Back side of rack)
Filter function	: None(non-compliant Security Function)
	Off(Filter OFF : Maintenance only)
	On(Filter ON : In Operation)
Client MAC Address	: MAC Address of PC for MCL View
Client IP Address	: IP Address of PC for MCL View

*1 About the Security Function
- When selecting the presence of "security function", other networks (VM-742B: Fieldbus(Modbus / TCP), Analysis software communication (TCP / IP)) to unify security policies are also " Please select the presence of security function ".
- Custom setup of "Security function" can't be order.
- Select "Security Function", you can meet a global certification program (Achilles Certification Level 2) that proves to have a certain network robustness.
- Achilles is a registered trademark of GE Digital.

ENVIRONMENTAL CONDITION

Operating temperature	: 0 to +65°C
Storage temperature	: -30 to +85°C
Relative humidity	: 20 to 95%RH (non-condensing)

POWER CONSUMPTION

Module alone : Less than 15W

MATERIAL and FINISH

Face plate	: ABS (Black)
Sheet	: Polyester tough top (Gray)
Base plate	: Alminium alloy (Silver)

MASS

Body : Max. 1.0 kg (2.2 lb)

ACCESSORY SPECIFICATION CODE / IDENTIFIED BY TB□

Code	Accessory	Quantity (Part Code)
/TB1	Phase Marker input terminal block plug (15pin) FRONT-MC-1.5/15-STF-3.81(PHOENIX CONTACT)	1piece (7072NAB)
	Phase Marker input terminal block plug (6pin) FRONT-MC-1.5/6-STF-3.81(PHOENIX CONTACT)	1piece (7072NAC)
	SYSTEM-OK output terminal block plug (6pin) FRONT-MC-1.5/6-STF-3.81(PHOENIX CONTACT)	1piece (7072NAC)
	Contact input terminal block plug (6pin) FRONT-MC-1.5/6-STF-3.81(PHOENIX CONTACT)	1piece (7072NAC)
/TB2	SYSTEM-OK output terminal block plug (6pin) FRONT-MC-1.5/6-STF-3.81(PHOENIX CONTACT)	1piece (7072NAC)
	Contact input terminal block plug (6pin) FRONT-MC-1.5/6-STF-3.81(PHOENIX CONTACT)	1piece (7072NAC)

Note) *1 D-sub plugs and hoods are not included in this code. Please make necessary arrangement separately, if required.
*2 When individually ordering specify the parts code, it is require to arrange for a necessary amount.

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

Default Value

INPUT (PHASE MARKER)

Not used

SYSTEM-OK ALARM

Alarm reset	: Auto Reset
Enagization method	: NORMALLY DE-ENERGIZED
Relay logic	: "OR" of all OK alarm

COMMUNICATION

IP Adress	: 192.168.8.8
Subnet mask	: 255.255.255.0
IP Port No.	: 8888

SECURITY FUNCTION(Case of None)

Filter	: None
Client MAC Address	: FF-FF-FF-FF-FF-FF
Client IP Address	:192.168.8.100

SECURITY FUNCTION(Case of Available)

Filter	: Off
Client MAC Address	: FF-FF-FF-FF-FF-FF
Client IP Address	:192.168.8.100

OTHERS

Alarm Contact Operation

Contact type	Enagization method	Power OFF	Power ON	
			Normal state	Alarm state
N.O. contact	NORMALLY DE-ENERGIZED	OPEN	OPEN	CLOSE
	NORMALLY ENERGIZED	OPEN	CLOSE	OPEN
N.C. contact	NORMALLY DE-ENERGIZED	CLOSE	CLOSE	OPEN
	NORMALLY ENERGIZED	CLOSE	OPEN	CLOSE

VM-7
MONITORING SYSTEM

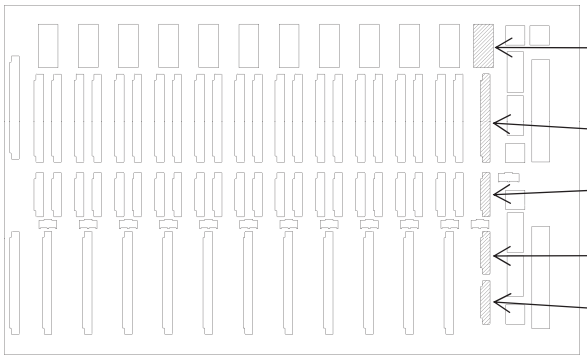
SPECIFICATIONS

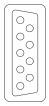
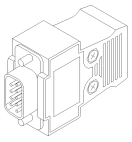
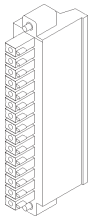
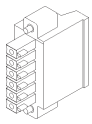
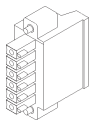
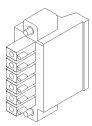
VM-741B LOCAL COMMUNICATION & PHASE MARKER MODULE

CE

Plug/ Terminal Block (Connector) Pin Assignment

VM-761B Instrument Rack
(Back)



	Back of Instrument Rack	Plug/ Terminal Block (Connector) Pin Assignment	Fitting Plug	Part Code
①		1 CH1 MON, 2 CH1 COM, 3 CH2 MON, 4 CH2 COM, 5 N/A; 6 CH3 MON, 7 CH3 COM, 8 CH4 MON, 9 CH4 COM		Plug 7072NAD Hood 7072NAG
②	A 	A1 CH1 SIG; A2 CH1 COM; A3 N/A; A4 CH1 POW; A5 CH1 SHIELD; A6 CH2 SIG; A7 CH2 COM; A8 N/A; A9 CH2 POW; A10 CH2 SHIELD; A11 CH3 SIG; A12 CH3 COM; A13 N/A; A14 CH3 POW; A15 CH3 SHIELD		7072NAB
③	B 	B1 CH4 SIG; B2 CH4 COM; B3 N/A; B4 CH4 POW; B5 CH4 SHIELD; B6 N/A		7072NAC
④	C 	C1 N/A; C2 N/A; C3 N/A; C4 N.O.; C5 SYSTEM-OK; C6 N.C.		7072NAC
⑤	D 	D1 RES1; D2 RES2; D3 SEQ1; D4 SEQ2; D5 FILT1; D6 FILT2		7072NAC

Note) For the accessory specification code “/TB1”, the fitting terminal block plugs ②③④⑤ are included.
For the accessory specification code “/TB1”, the D-sub plug and hood ① are not included. If required, please make necessary arrangement separately referring to the part code above.

VM-7
MONITORING SYSTEM

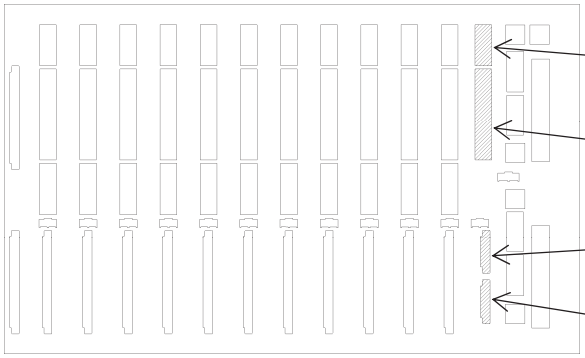
SPECIFICATIONS

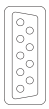
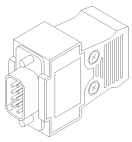
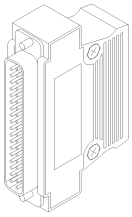
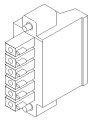
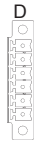
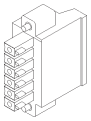
VM-741B LOCAL COMMUNICATION & PHASE MARKER MODULE

CE

Plug/ Terminal Block (Connector) Pin Assignment

VM-762B Instrument Rack
(Back)



	Back of Instrument Rack	Plug/ Terminal Block (Connector) Pin Assignment	Fitting Plug	Part Code
①		1 CH1 MON, 2 CH1 COM, 3 CH2 MON, 4 CH2 COM, 5 N/A; 6 CH3 MON, 7 CH3 COM, 8 CH4 MON, 9 CH4 COM		Plug 7072NAD Hood 7072NAG
②	A 	A1 CH1 IN, A2 CH1 COM, A3 N/A, A4 CH1 POW, A5 CH1 SLD, A6 CH2 IN, A7 CH2 COM, A8 N/A, A9 CH2 POW, A10 CH2 SLD, A11 CH3 IN, A12 CH3 COM, A13 N/A, A14 CH3 POW, A15 CH3 SLD, A16 N/A, A17 N/A, A18 N/A, A19 N/A; A20 CH4 IN, A21 CH4 COM, A22 N/A, A23 CH4 POW, A24 CH4 SLD, A25 N/A, A26 N/A, A27 N/A, A28 N/A, A29 N/A, A30 N/A, A31 N/A, A32 N/A, A33 N/A, A34 N/A, A35 N/A, A36 N/A, A37 N/A		Plug 7072NAF Hood 7072NAJ
③	C 	C1 N/A, C2 N/A, C3 N/A, C4 N.O., C5 SYSTEM-OK, C6 N.C.		7072NAC
④	D 	D1 RES1, D2 RES2, D3 SEQ1, D4 SEQ2, D5 FILT1, D6 FILT2		7072NAC

Note) For the accessory specification code "/TB2", the fitting terminal block plugs ③④ are included.
For the accessory specification code "/TB2", the D-sub plugs and hoods ①② are not included. If required, please make necessary arrangement separately referring to the part code above.

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-742B NETWORK COMMUNICATION MODULE

CE

Model Code / Additional Spec. Code (No entry if additional spec, code is not specified.)

【When "Security function" is not selected】

VM-742B□ – □

Install location		Communication port	
1	C1 (Upper position)	1	Port A : Fieldbus (Modbus/TCP) Port B : Blank
2	C2 (Lower position)	2	Port A : Fieldbus (Modbus/RTU) Port B : Blank
		3	Port A : Analysis software communication (TCP/IP) Port B : Blank
		4	Port A : Fieldbus (Modbus/RTU) Port B : Fieldbus (Modbus/TCP)
		5	Port A : Fieldbus (Modbus/TCP) Port B : Analysis software communication (TCP/IP)
		6	Port A : Fieldbus (Modbus/RTU) Port B : Analysis software communication (TCP/IP)

~~/NB1~~ /CS□ ~~/TRP~~ /CTR ~~/WD1~~

~~Non-incendive~~		Custom setup				Tropical spec.	Option	1 sec wave datacollection
~~1~~	~~Class I Division 2 CSA~~	0	・IP address setup	B	・IP address setup ・Customize work 91ch to 100ch			
		1	・IP address setup ・Customize work 1ch to 10ch	C	・IP address setup ・Customize work 101ch to 110ch			
		2	・IP address setup ・Customize work 11ch to 20ch	D	・IP address setup ・Customize work 111ch to 120ch			
		3	・IP address setup ・Customize work 21ch to 30ch	E	・IP address setup ・Customize work 121ch to 130ch			
		4	・IP address setup ・Customize work 31ch to 40ch	F	・IP address setup ・Customize work 131ch to 140ch			
		5	・IP address setup ・Customize work 41ch to 50ch	G	・IP address setup ・Customize work 141ch to 150ch			
		6	・IP address setup ・Customize work 51ch to 60ch	H	・IP address setup ・Customize work 151ch to 160ch			
		7	・IP address setup ・Customize work 61ch to 70ch	J	・IP address setup ・Customize work 161ch to 170ch			
		8	・IP address setup ・Customize work 71ch to 80ch	K	・IP address setup ・Customize work 171ch to 180ch			
		9	・IP address setup ・Customize work 81ch to 90ch	L	・IP address setup ・Customize work 181ch to 190ch			
				M	・IP address setup ・Customize work 191ch to 200ch			

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-742B NETWORK COMMUNICATION MODULE

CE

Model Code / Additional Spec. Code (No entry if additional spec, code is not specified.)

【When "Security function" is selected】

VM-742B□ – □ - 2

Install location		Communication port		Security Function	
1	C1 (Upper position)	1	Port A : Fieldbus (Modbus/TCP) Port B : Blank	0	None
2	C2 (Lower position)	2	Port A : Fieldbus (Modbus/RTU) Port B : Blank	2	Available (Achilles Certificate Level2)
		3	Port A : Analysis software communication (TCP/IP) Port B : Blank		
		4	Port A : Fieldbus (Modbus/RTU) Port B : Fieldbus (Modbus/TCP)		
		5	Port A : Fieldbus (Modbus/TCP) Port B : Analysis software communication (TCP/IP)		
		6	Port A : Fieldbus (Modbus/RTU) Port B : Analysis software communication (TCP/IP)		

/NB1 /CS□ /TRP /CTR

Non-incendive		Custom setup				Tropical spec.	Option
1	Class I Division 2 CSA	0	・IP address setup	B	・IP address setup ・Customize work 91ch to 100ch		
		1	・IP address setup ・Customize work 1ch to 10ch	C	・IP address setup ・Customize work 101ch to 110ch		
		2	・IP address setup ・Customize work 11ch to 20ch	D	・IP address setup ・Customize work 111ch to 120ch		
		3	・IP address setup ・Customize work 21ch to 30ch	E	・IP address setup ・Customize work 121ch to 130ch		
		4	・IP address setup ・Customize work 31ch to 40ch	F	・IP address setup ・Customize work 131ch to 140ch		
		5	・IP address setup ・Customize work 41ch to 50ch	G	・IP address setup ・Customize work 141ch to 150ch		
		6	・IP address setup ・Customize work 51ch to 60ch	H	・IP address setup ・Customize work 151ch to 160ch		
		7	・IP address setup ・Customize work 61ch to 70ch	J	・IP address setup ・Customize work 161ch to 170ch		
		8	・IP address setup ・Customize work 71ch to 80ch	K	・IP address setup ・Customize work 171ch to 180ch		
		9	・IP address setup ・Customize work 81ch to 90ch	L	・IP address setup ・Customize work 181ch to 190ch		
				M	・IP address setup ・Customize work 191ch to 200ch		

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-742B NETWORK COMMUNICATION MODULE

CE

Specification

OUTPUT

Indicator : ACTIVE 1 LED (Green)
- On : Communication function included
- Off : Communication function not included

COMM 1 LED (Green)
- On : Communication is connected
- Flash : Communication data is being passed
- Off : Communication is disconnected

ACTIVE 2 LED (Green)
- On : Communication function included
- Off : Communication function not included

COMM 2 LED (Green)
- On : Communication is connected
- Flash : Communication data is being passed
- Off : Communication is disconnected

ANALYSIS SOFTWARE COMMUNICATION

Network	: Ethernet 100Base-TX Max. distance Hub to nodes between 90m.
protocol	: TCP/IP
I/O connector	: RJ-45 (on VM-76☐B rear panel)
Communication item	: Dynamic data, Static data, Event history Refer to the specification sheet of VM-773B infiSYS ANALYSIS VIEW

Note : For redundant analysis software communication, a total of two modules are required.

FIELD BUS COMMUNICATION

Protocol : Modbus/TCP

Network	: Ethernet 10Base-T / 100Base-TX
Connector	: RJ-45 (on VM-76☐B rear panel)
Connection	: 2

: Modbus/RTU

Network	: RS-485
Baud rate	: 9600,19200 bps
Data length	: 8 bit
Parity*2	: ODD (odd number), EVEN (even number), NONE (none)
Stop bit	: 1 bit
Flow control	: None
Protocols*1	: Modbus® Based on AEG Modicon PI-MBUS-300 Reference Manual. Uses Remote Terminal Unit (RTU) transmission mode.
Slave ID	: Set range 1 to 247
Terminal setting*2	: ON or OFF Specified when ordering. Unless specified otherwise Slot C1 : ON Slot C2 : ON
I/O Connector	: 9pin D-sub (on VM-76☐B rear panel)

Note: For redundancy using Modbus, a total of two modules are required.

Communication item

: Data transmitted to host network
Measurement value, GAP, Danger Alarm status,
Alert Alarm status, OK Alarm status, Danger Bypass status,
Setting of DANGER / ALERT, and OK Limit
High-pass Filter (10pole) ON/OFF status, Power-OK status,
Analyzed Data *3 (0.5X amp./Phase, 1X amp./Phase,
2X amp./Phase, Not-1X amp,$S_{(p\text{-}p)\ max.}$)

Data received from host network
Date and Time Data

Option communication item (/CTR) *4

: Items Controllable from host network
CH Bypass status ON / OFF, Danger Bypass status ON / OFF,
Low Alarm Bypass status ON/OFF, Alarm Reset,
Sequence Mode ON / OFF, High-pass Filter (10 pole) ON / OFF,
Peak Hold Reset, Firstout Reset

Note)
*1 Modbus is a registered trademark of Modicon, Inc.
*2 Can be changed by internal switch.
*3 When the analysis option is added on VM-701B and/or VM-702B monitor module.
*4 VM-7B can be controlled by the host computer.by adding the option.

Note : The daisy chain connections are eight racks or less.

SECURITY FUNCTION*1

Network	: Ethernet 100Base-TX
Protocol	: Fieldbus(Modbus/TCP) Analysis software communication (TCP/IP)
Connector	: RJ-45(Back side of rack)
Filter function (Mobus/TCP)	: None(non-compliant Security Function) Off(Filter OFF : Maintenance only) On(Client1 only) (Only one client PC Fileter ON: In Operation) On(Client1 & Client2) (Filter ON for all client PCs)
Filter function (TCP/IP)	: None(non-compliant Security Function) Off(Filter OFF : Maintenance only) On(Filter OFF : In Operation)
Client(1 or 2) MAC Address	: MAC Address of PC for Modbus/TCP or infiSYS Analisys View
Client(1 or 2) IP Address	: IP Address of PC for Modbus/TCP or infiSYS Analisys View

*1 About the Security Function
- When selecting the presence of "security function", other networks (VM-741B:MCL View) to unify security policies are also " Please select the presence of security function "
- "Security Function" is the network of "Fieldbus（Modbus/TCP）" and "Analysis software communication(TCP/IP) ".
- Custom setup of "Security function" can't be order.
- Select "Security Function", you can meet a global certification program (Achilles Certification Level 2) that proves to have a certain network robustness.
- Achilles is a registered trademark of GE Digital.

ENVIRONMENTAL CONDITION

Operating temperature	: 0 to +65°C
Storage temperature	: -30 to +85°C
Relative humidity	: 20 to 95%RH (non-condensing)

POWER CONSUMPTION

Module alone : Less than 15W

MATERIAL AND FINISH

Face plate	: ABS (Black)
Sheet	: Polyester tough top (Gray)
Base plate	: Alminium alloy (Silver)

MASS

Body : Max. 0.5kg (1.1lb)

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

OTHERS

Note) One or two modules can be installed in one rack, in either Slot C1 or C2 or both.

VM-7 SERIES
MONITORING SYSTEM

SPECIFICATIONS

VM-742B NETWORK COMMUNICATION MODULE

Default Value

FIELDBUS COMMUNICATION (MODBUS/TCP)

Slave ID	: 1
IP Address	: 192.168.8.1
Subnet mask	: 255.255.255.0
Port number	: 502
Time out	: Enable (10sec)

FIELDBUS COMMUNICATION (MODBUS/RTU)

Slave ID	: 2
Baud rate	: 9600bps
Data length	: 8bit
Parity	: NONE
Stop bit	: 1bit

ANALYSIS SOFTWARE COMMUNICATION

IP Address	: 192.168.8.100
Subnet mask	: 255.255.255.0
Port number	: 8882
Time out	: Enable (10sec)

SECURITY FUNCTION Modbus/TCP (Case of None)

Filter	: None
Client1 MAC Address	: FF-FF-FF-FF-FF-FF
Client1 IP Address	: 192.168.8.100
Client2 MAC Address	: FF-FF-FF-FF-FF-FF
Client2 IP Address	: 192.168.8.100

SECURITY FUNCTION Analysis (Case of None)

Filter	: None
Client MAC Address	: FF-FF-FF-FF-FF-FF
Client IP Address	: 192.168.8.100

SECURITY FUNCTION Modbus/TCP (Case of Available)

Filter	: Off
Client1 MAC Address	: FF-FF-FF-FF-FF-FF
Client1 IP Address	: 192.168.8.100
Client2 MAC Address	: FF-FF-FF-FF-FF-FF
Client2 IP Address	: 192.168.8.100

SECURITY FUNCTION Analysis (Case of Available)

Filter	: None
Client MAC Address	: FF-FF-FF-FF-FF-FF
Client IP Address	: 192.168.8.100

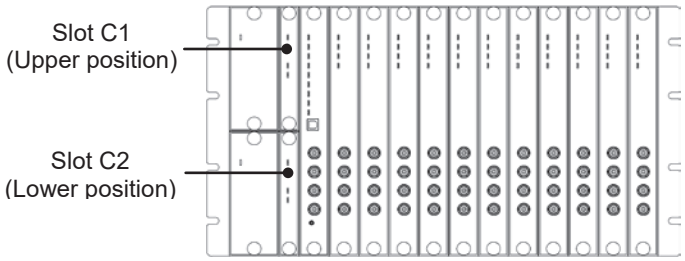
VM-7 SERIES
MONITORING SYSTEM

SPECIFICATIONS

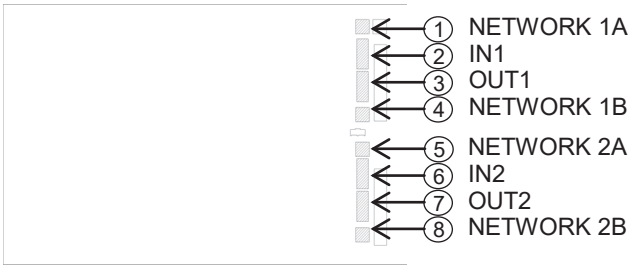
VM-742B NETWORK COMMUNICATION MODULE

CE

Module Location



VM-761B, VM-762B Instrument Rack (Back)



Location	Model Code	Network Interface Connector		
		Communication port	Communication type	Number
Slot C1	VM-742B1-1	Port A	Fieldbus (Modbus/TCP)	①
		Port B	Blank	–
	VM-742B1-2	Port A	Fieldbus (Modbus/RTU)	②, ③
		Port B	Blank	–
	VM-742B1-3	Port A	Analysis software communication (TCP/IP)	①
		Port B	Blank	–
	VM-742B1-4	Port A	Fieldbus (Modbus/RTU)	②, ③
		Port B	Fieldbus (Modbus/TCP)	④
	VM-742B1-5	Port A	Fieldbus (Modbus/TCP)	①
		Port B	Analysis software communication (TCP/IP)	④
	VM-742B1-6	Port A	Fieldbus (Modbus/RTU)	②, ③
		Port B	Analysis software communication (TCP/IP)	④
Slot C2	VM-742B2-1	Port A	Fieldbus (Modbus/TCP)	⑤
		Port B	Blank	–
	VM-742B2-2	Port A	Fieldbus (Modbus/RTU)	⑥, ⑦
		Port B	Blank	–
	VM-742B2-3	Port A	Analysis software communication (TCP/IP)	⑤
		Port B	Blank	–
	VM-742B2-4	Port A	Fieldbus (Modbus/RTU)	⑥, ⑦
		Port B	Fieldbus (Modbus/TCP)	⑧
	VM-742B2-5	Port A	Fieldbus (Modbus/TCP)	⑤
		Port B	Analysis software communication (TCP/IP)	⑧
	VM-742B2-6	Port A	Fieldbus (Modbus/RTU)	⑥, ⑦
		Port B	Analysis software communication (TCP/IP)	⑧

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-75□B POWER SUPPLY MODULE

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

VM-75□B□/~~NB1~~ ~~/TRP~~

Power supply Rating		Install location		~~Non-incendive~~	Tropical spec.
1	AC100-240V	1	P1 slot (Primary / upper position)	1 ~~Class I Division 2 CSA~~	
3	DC24V	2	P2 slot (Secondary / lower position)		
4	DC110-220V				

Specification

INPUT

Rated voltage : VM-751B (AC) : 100-240VAC/50-60Hz
VM-753B (DC24V) : 24VDC
VM-754B (DC110-220V)
: 110-220VDC

Power consumption : VM-751B (AC)
Rack configuration A*2 : 206VA / 100VAC
196VA / 240VAC
Rack configuration B*3 : 217VA / 100VAC
217VA / 240VAC

VM-753B（DC）
Rack configuration A*2 : 200W / 24VDC
Rack configuration B*3 : 212W / 24VDC

VM-754B (DC110-220V)
Rack configuration A*2 : 204W / 110VDC
196W / 220VDC
Rack configuration B*3 : 212W / 110VDC
212W / 220VDC

*2 Rack configuration A : VM-741Bx1,VM-742Bx2,VM-701B/PM0/ALYx11
*3 Rack configuration B : VM-741Bx1,VM-742Bx2,VM-701B/PM1/ALYx11

Voltage range : VM-751B (AC) : 85-264VAC
VM-753B (DC) : 21.6-26.4VDC
VM-754B (DC110-220V)
: 88-253VDC

OUTPUT

Power output : Output to each module via mother board
Rated Voltage : 26V (Primary)、24V (Secondary)
Rated Power : 180W
Indicators : POWER-OK LED (Green)
Normal : ON
Abnormal : OFF
Contact output : Output points : 1point
Contact type : Dry CONTACT (SPDT)
Enegization method: Normally Energized
Contact capacity : 250VAC / 5A、30VDC / 5A

ENVIRONMENTAL CONDITION

Operating temperature : 0 to +65°C
Storage temperature : -30 to +85°C
Relative humidity : 20 to 95%RH (non-condensing)

INSULATION RESISTANCE

Between power supply and contact ,GND : 100MΩ at 500VDC

DIELECTRIC STRENGTH

Between power supply and GND : 2000VAC one minute
Between contact and GND : 500VAC one minute

MATERIAL AND FINISH

Face plate : ABS (Black)
Sheet : Polyester tough top (Gray)
Base plate : Alminium alloy (Silver)

MASS

Body : Max. 1.5kg (3.3lb)

Contact Operation

Contact type	Enagization method	Power OFF	Power ON	
			Normal state	Abnormal state
N.O. contact	NORMALLY ENERGIZED	OPEN	CLOSE	OPEN
N.C. contact	NORMALLY ENERGIZED	CLOSE	OPEN	CLOSE

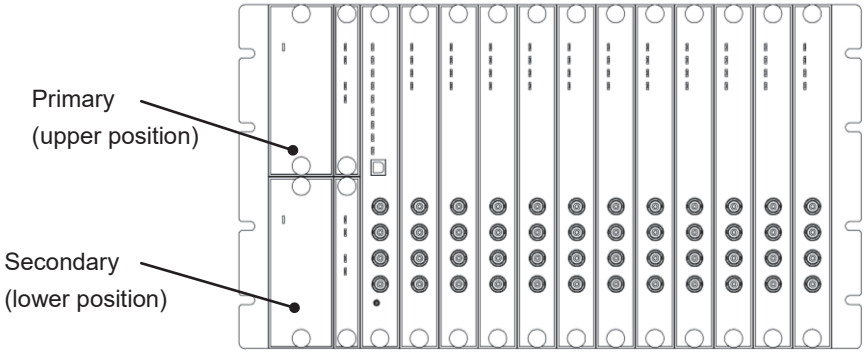
VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-75□B POWER SUPPLY MODULE

Module Location

VM-76□B Instrument rack



VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-76□B INSTRUMENT RACK

CE

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

VM-76□B /~~NB1/TRP~~

	I/O type		~~Non-incendive~~	Tropical spec.
1	European I/O Terminal Type	1	~~Class I Division 2 CSA~~	
2	D-sub I/O Connector Type			

VM-761B Terminal Block / Connector Specification

TRANSDUCER INPUT TERMINAL BLOCK

Type and number : 15pin × 2blocks × 11sets
Matching plug : FRONT-MC1.5/15-STF-3.81 (PHOENIX CONTACT)

RECORDER OUTPUT TERMINAL BLOCK

Type and number : 6pin × 2blocks × 11sets
Matching plug : FRONT-MC1.5/6-STF-3.81 (PHOENIX CONTACT)

CONTACT OUTPUT TERMINAL BLOCK

Type and number : 18pin × 11pieces
Matching plug : FRONT-MC1.5/18-STF-3.81 (PHOENIX CONTACT)

18 CHANNEL RELAY MODULE OUTPUT TERMINAL BLOCK

Type and number : 18pin × 2pieces
Matching plug : FRONT-MC1.5/18-STF-3.81 (PHOENIX CONTACT)

PHASE MARKER INPUT TERMINAL BLOCK

Type and number : 15pin × 1piece
6pin × 1piece
Matching plug : FRONT-MC1.5/15-STF-3.81 (PHOENIX CONTACT)
FRONT-MC1.5/6-STF-3.81 (PHOENIX CONTACT)

CONTACT INPUT TERMINAL BLOCK

Type and number : 6pin × 1piece
Matching plug : FRONT-MC1.5/6-STF-3.81 (PHOENIX CONTACT)

SYSTEM-OK OUTPUT TERMINAL BLOCK

Type and number : 6pin × 1piece
Matching plug : FRONT-MC1.5/6-STF-3.81 (PHOENIX CONTACT)

MONITOR OUTPUT CONNECTOR

Type and number : 9pin D-sub (female) × 11pieces
Fastener size : #4-40UNC
Matching plug : XM3A-0921 (OMRON)
Matching hood : XM2S-0913 (OMRON)

PHASE MARKER MONITOR OUTPUT CONNECTOR

Type and number : 9pin D-sub (female) × 1piece
Fastener size : #4-40UNC
Matching plug : XM3A-0921 (OMRON)
Matching hood : XM2S-0913 (OMRON)

DISPLAY/LOCAL COMMUNICATION CONNECTOR (for MCL View)

Type and number : RJ-45 × 1piece
Network : Ethernet 100Base-TX

DISPLAY COMMUNICATION CONNECTOR (for Touch Screen)

Type and number : 5pin connector × 1piece
Network : RS-485

NETWORK INTERFACE CONNECTOR (for TCP/IP, Modbus/TCP)

Type and number : RJ-45 × 4pieces
Network : Ethernet 100Base-TX / 10Base-T

NETWORK INTERFACE CONNECTOR (for Modbus/RTU)

Type and number : 9pin D-sub (male) (IN) × 2sets
: 9pin D-sub (male) (OUT) × 2sets
Fastener size : #4-40UNC
Matching plug : XM3D-0921 (OMRON)
Matching hood : XM2S-0913 (OMRON)
Network : RS-485

POWER SUPPLY MODULE TERMINAL BLOCK

Primary for power supply : 1piece
Secondary for power supply : 1piece

OTHERS

Note) The terminal block of each terminals is accessories for each monitor modules. (see each spec sheets)
Connector and hood are not included. It is sold separately.

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-76□B INSTRUMENT RACK

CE

VM-762B Terminal Block / Connector Specification

TRANSDUCER INPUT CONNECTOR

Type and number : 37pin D-sub (female) × 11pieces
Fastener size : #4-40UNC
Matching plug : XM3A-3721 (OMRON)
Matching hood : XM2S-3713 (OMRON)

RECORDER OUTPUT CONNECTOR

Type and number : 15pin D-sub (female) × 11pieces
Fastener size : #4-40UNC
Matching plug : XM3A-1521 (OMRON)
Matching hood : XM2S-1513 (OMRON)

CONTACT OUTPUT TERMINAL BLOCK

Type and number : 18pin × 11pieces
Matching plug : FRONT-MC1.5/18-STF-3.81 (PHOENIX CONTACT)

18 CHANNEL RELAY MODULE OUTPUT TERMINAL BLOCK

Type and number : 18pin × 2pieces
Matching plug : FRONT-MC1.5/18-STF-3.81 (PHOENIX CONTACT)

PHASE MARKER INPUT CONNECTOR

Type and number : 37pin D-sub (female)× 1piece
Fastener size : #4-40UNC
Matching plug : XM3A-3721 (OMRON)
Matching hood : XM2S-3713 (OMRON)

CONTACT INPUT TERMINAL BLOCK

Type and number : 6pin × 1piece
Matching plug : FRONT-MC1.5/6-STF-3.81 (PHOENIX CONTACT)

SYSTEM-OK OUTPUT TERMINAL BLOCK

Type and number : 6pin × 1piece
Matching plug : FRONT-MC1.5/6-STF-3.81 (PHOENIX CONTACT)

MONITOR OUTPUT CONNECTOR

Type and number : 9pin D-sub (female)× 11pieces
Fastener size : #4-40UNC
Matching plug : XM3A-0921 (OMRON)
Matching hood : XM2S-0913 (OMRON)

PHASE MARKER MONITOR OUTPUT CONNECTOR

Type and number : 9pin D-sub (female) × 1piece
Fastener size : #4-40UNC
Matching plug : XM3A-0921 (OMRON)
Matching hood : XM2S-0913 (OMRON)

DISPLAY /LOCAL COMMUNICATION CONNECTOR (for MCL View)

Type and number : RJ-45 × 1piece
Network : Ethernet 100Base-TX

DISPLAY COMMUNICATION CONNECTOR (for Touch Screen)

Type and number : 5pin connector × 1piece
Network : RS-485

NETWORK INTERFACE CONNECTOR (for TCP/IP, Modbus/TCP)

Type and number : RJ-45 × 4pieces
Network : Ethernet 100Base-TX / 10Base-T

NETWORK INTERFACE CONNECTOR (for Modbus/RTU)

Type and number : 9pin D-sub(male) (IN) × 2sets
: 9pin D-sub(male) (OUT) × 2sets
Fastener size : #4-40UNC
Matching plug : XM3D-0921 (OMRON)
Matching hood : XM2S-0913 (OMRON)
Network : RS-485

POWER SUPPLY MODULE TERMINAL BLOCK

Primary for power supply : 1piece
Secondary for power supply : 1piece

OTHERS

Note) The terminal block of each terminals is accessories for each monitor modules. (see each spec sheets)

Connector and hood are not included. It is sold separately.

Standard Common Specifications

ENVIRONMENTAL CONDITION

Operating temperature : 0～+65°C
Storage temperature : -30～+85°C
Relative humidity : 20～95%RH (non-condensing)

INSULATION RESISTANCE

Between power supply and contact ,GND : 100MΩ at 500VDC

DIELECTRIC STRENGTH

Between power supply and GND : 2000VAC one minute
Between contact and GND : 500VAC one minute

MATERIAL AND FINISH

Body : Highly corrosionresistant hot dip coated steel sheet (Silver)
Side panel : SPCC (Black)

MASS

VM-761B : Max. 9.5kg (21lb) (exclude plug)
VM-762B : Max. 10.5kg (23lb)

Note) If you consider the panel is lacking in strength, use additional fasteners to support the unit.

OUTLINE SIZE

Max. : W 482.6 × H 265.9 × D 350 (mm)

SEPARATELY SOLD ITEM

Bezel : VZ-78-1

OTHERS

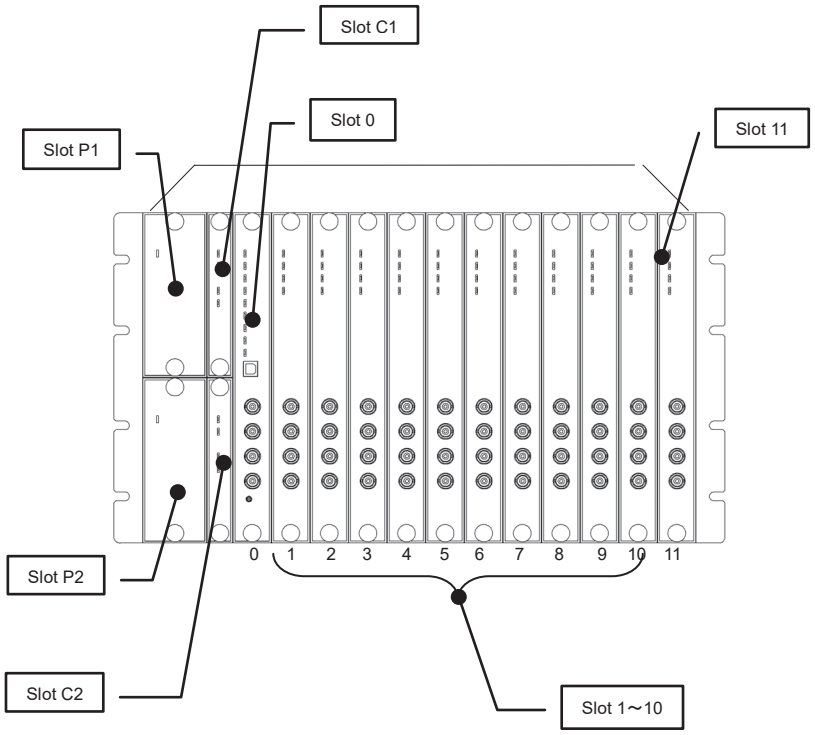
VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-76□B INSTRUMENT RACK

CE

Module Location



Module / Panel	Model	Slot No.															
		P1	P2	C1	C2	0	1	2	3	4	5	6	7	8	9	10	11
Power Supply Module (primary)	VM-75□1B	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Supply Module (secondary)	VM-75□2B	-	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local Communication & Phase Marker Module	VM-741B	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-	-
Network Communication Module	VM-742B	-	-	○	○	-	-	-	-	-	-	-	-	-	-	-	-
Vibration/Displacement Monitor Module	VM-701B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
Absolute Vibration Monitor Module	VM-702B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
Tachometer & Eccentricity Monitor Module	VM-703B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
Temperature Monitor Module	VM-704B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
18-Channel Temperature Monitor Module	VM-705B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
Rod Drop Monitor Module	VM-706B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
Aeroderivative Gas Turbine Monitor Module	VM-707B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
18-Channel Relay Module	VM-721B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○
9-Channel Relay Module	VM-722B	-	-	-	-	-	○	○	○	○	○	○	○	○	○	○	○
30mm (W) Blank Panel	VZ-71	-	-	-	-	-*1	○	○	○	○	○	○	○	○	○	○	○
20mm (W) Blank Panel	VZ-75	-	-	○	○	-	-	-	-	-	-	-	-	-	-	-	-
50mm (W) Blank Panel	VZ-76	-*2	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*1 Local Communication & Phase Marker Module installed in Slot 0 with any rack design.

*2 Primary power supply installed in Slot P1.

infiSYS RV-200
SYSTEM

SPECIFICATION

VM-773B infiSYS ANALYSIS VIEW

Model Code / Additional Spec. Code (No entry if additional spec, code is not specified.)

VM-773B-□□ /GRA /GRB /GRC /GR1/ GR2/ GR3/ GR4/ GR5/ AN1/ RB1 /RB2 /RB3 WF1 /SU□

Input channel number	
01	12ch or less
02	13ch to 27ch
03	28ch or more

Graph option*1*2			
/GRA	Sleeve bearing set (Including /GR1 to /GR5,/AN1)	/GR1	Cascade plot
		/GR2	Full spectrum plot
/GRB	Rolling bearing set (Including /RB1 to /RB3)	/GR3	Full waterfall plot
		/GR4	Full cascade plot
/GRC	All round set (Including all graphs)	/GR5	Campbell plot
		/AN1	Runout (Slow roll vector)
		/RB1	Peak analysis, Order analysis, Side band analysis
		/RB2	Crest factor, Form factor, Kurtosis, Skewness, Envelope
		/RB3	Spectrum alarm

Data file output

Set up Configuration point*3							
0	No configuration	5	101 to 125 points	A	226 to 250 points	F	351 to 375 points
1	1 to 25 points	6	126 to 150 points	B	251 to 275 points	G	376 to 400 points
2	26 to 50 points	7	151 to 175 points	C	276 to 300 points	H	401 to 425 points
3	51 to 75 points	8	176 to 200 points	D	301 to 325 points	J	426 to 450 points
4	76 to 100 points	9	201 to 225 points	E	326 to 350 points	K	451 to 480 points

*1 When specifying from / GRA to / GRC, specify only one of them.
*2 When specifying the "additional specification code" additionally in the set of graphs, please do not duplicate.
*3 A PC and Microsoft SQL Server are required. Setup option includes initial setup of the PC, installation of the software and IP address setting.
It does not include creation of Modbus server communication setting file, registration and setting of Modbus client, registration and setting of wireless client.

Functions and graphs that can be used for each set

Category	Additional Spec. Code	List and graphs	/GRA to /GRC nothing Basic set	/GRA Sleeve bearing set	/GRB Rolling bearing set	/GRC All round set
Basic function	—	List of current values, List of alarm Setting values, Device list, Event history, Machine train, Trend plot, Long term trend plot, Bar graph, Spectrum plot, Waveform plot, Waterfall plot, X-Y plot, Orbit & waveform plot, Polar plot, Shaft centerline plot, S-V plot, Bode plot	●	●	●	●
Function for sleeve bearing	/GR1	Cascade plot	-	●	-	●
	/GR2	Full spectrum plot	-	●	-	●
	/GR3	Full waterfall plot	-	●	-	●
	/GR4	Full cascade plot	-	●	-	●
	/GR5	Campbell plot	-	●	-	●
	/AN1	Runout correction (Slow roll vector)	-	●	-	●
Function for rolling bearing	/RB1	Peak analysis, Order analysis, Side band analysis	-	-	●	●
	/RB2	Crest factor, Form factor, Kurtosis, Skewness, Envelope	-	-	●	●
	/RB3	Spectrum alarm	-	-	●	●

●: Functions included as standard

infiSYS RV-200
SYSTEM

SPECIFICATION

VM-773B infiSYS ANALYSIS VIEW

Specification

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS (RECOMMENDED OPERATING ENVIRONMENT)

PC/AT compatible personal computer, work station, server, FA-PC*1	
Processor	Intel® Core™ i7 or Xeon® Processor
Memory	16 GB or higher recommended
Display	1280 × 800 or higher resolution is recommended
Graphic card	Direct X 9.0C or higher compatible graphics card
Hard disk drive	1 TB or greater free space recommended
Drive	DVD-ROM drive
Network	Ethernet 100 BASE-TX or higher

SOFTWARE REQUIREMENTS

Category	Model	Edition	Version
OS	Microsoft® Windows® 10 (64bit)	Pro or higher	Any
	Microsoft® Windows® 10 IoT(64bit) *1	Enterprise	2016LTSB
	Microsoft® Windows Server® 2016(64bit)	Standard or higher	Any
DB	Microsoft® SQL Server® 2014(64bit)*2	Standard or higher	SP2
	Microsoft® SQL Server® 2016 (64bit)	Standard or higher	Any
	Microsoft® SQL Server® 2017 (64bit)	Standard or higher	Any
Others	Microsoft® .NET Framework	—	3.5

*1 Please inquire separately for models to which processors can be applied.
*2 SQL Server® 2014 cannot be used with Windows Server® 2016.

ANALYSIS COMMUNICATION FUNCTION (Monitor Communication)

Protocol : TCP / IP based proprietary method
Number of simultaneous connection : 20
Received data : Trend data(vibration, process), waveform data, event data(alarm)

Modbus SERVER FUNCTION (SLEAVE SIDE: DATA RETURN)

Protocol : Modbus/TCP (RTU mode)
Number of simultaneous connection : 5
Data to be sent : Measured value and alarm status

Modbus CLIENT FUNCTION (MASTER SIDE: DATA REQUEST)

Protocol : Modbus/TCP (RTU mode)
Received data : Various numerical data

MAINTENANCE FUNCTION

Database backup

DATA FILE OUTPUT FUNCTION（OPTION）*3

Data collected from devices and configuration information are converted to a file and output.

TARGET DATA*4

Measurement data : Trend data*5
: Waveform data (synchronous, asynchronous)*6
: Spectrum data(synchronous, asynchronous）*6
: Diagnostic trend data*7
: Alarm history
: Transient history
Setting information : infiSYS configuration information *8
: Channel setting value
: Alarm setting value
: Runout correction value

*3 If the waveform data storage interval is shorter than 10 seconds, stored data may be lost.
*4 Each data except infiSYS configuration information is output in CSV format. infiSYS configuration information is output in XML format.
*5 TOP n data of the 920 MHz wireless sensor is not supported.
*6 Waveform data of ISA-100 wireless sensor is not supported.
*7 To output the diagnostic trend data, separately prepare VM-781B infiSYS Diagnostic Software.
*8 The registered devices and the channels contained in them are output in a hierarchical structure.

OUTPUT FILE

Output interval : 60 to 86400 seconds

DATA DISPLAY FUNCTION

DISPLAY

Displayable graphs :
Trend plot, long term trend plot, bar graph, spectrum plot, waveform plot, orbit and waveform plot, waterfall plot, polar plot, shaft centerline plot, X-Y plot, S-V plot, Bode plot
List view :
List of current values, list of alarm setting values, event history*9, device list
Machine train (maximum 24)

*9 In order to display the hardware event history of the VM - 7B monitor on the event history screen of this software, it is necessary to specify / MEM for the VM-741B Local Communication & Phase Marker Module.

DATA DISPLAY FUNCTION

DISPLAY (OPTION)

Displayable graphs :
Cascade plot, full spectrum plot, full waterfall plot, full cascade plot, Campbell plot
Analysis :
Peak analysis, order analysis, side band analysis, crest factor, form factor, kurtosis, skewness, envelope, runout (slow roll vector)

OTHERS

Tile display : Up to 8 single channel graphs or up to 4 paired channel graphs.
Graph display switch tab :Up to 20 graph display pages can be created.

SOFTWARE DISTRIBUTION MEDIA

CD-ROM

ACCESSORIES

USB protection key

⚠ WARNING: Loss of USB Protection Key
This product works in conjunction with the USB protection key included in the package; hence, the key has the value equivalent to the application software. Please note that the key is not sold by itself.
Be sure to store it in a secure place because if the USB protection key should be lost, the customer would have to purchase another set of the product.

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

※ The specifications and other items indicated herein are subject to change without notice.

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-771B MCL VIEW

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

VM-771B /SU0

Setup *1

*1 A PC is required. Setup option includes initial setup of the PC, installation of the software and PC address setting.

Specification

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

PC/AT compatible personal computer	
Processor	Intel Pentium® compatible (1GHz or higher) processor clock speed recommended
Memory	1GB or higher recommended
Display	1024 X 768 or higher-resolution
Hard disk drive	15GB of available hard-disk space
Drive	CD-ROM drive
Network	Ethernet 100 BASE-TX

SOFTWARE REQUIREMENTS

Category	Model	Edition	Version
OS	Microsoft® Windows® XP (32bit)*2	Professional	SP3
	Microsoft® Windows® 7 (32/64bit)	Professional or higher	Any
	Microsoft® Windows® 8.1(32/64bit)	Pro or higher	Any
	Microsoft® Windows® 10 (32/64bit)	Pro or higher	Any
Others	Microsoft® Windows® installer	—	3.1 or later
	Microsoft® .NET Framework	—	3.5

CONNECTION

Supported devices : VM-7B Monitor, VM-7 Monitor*2
Total input : 4 devices (Max.)*3

*2 Modules with firmware versions V0.9.0 or later are required.
*3 Multiple concurrent communication requires a hub.

COMMUNICATION

Network : Ethernet 100Base-TX
Protocol : TCP/IP

RECORDING

SHORT TERM DATA

Data : Measured values of each modules
Acquisition interval : 1 sec.
Period : 1 week

LONG TERM DATA

Data : Maximum values and mean values of measured values
Acquisition interval : 1 hour
Period : 3 years

SCREEN

Bar graph screen : Measured values are displayed in rectangular bars.
Relay status screen : Relay status and logic is displayed.
Trend graph screen : Short term data or long term data is displayed.
Range of short term data display
: 1 hour / 30 minutes / 15 minutes / 10 minutes / 5 minutes / 2 minutes
Range of long term data display
: 3 months / 1 month / 2 weeks / 1 week / 3 days / 1 day
Train screen : Displays measured values and the train diagram.
Detailed information window
: Monitor range and alarm set values are displayed.

DISPLAY DATA

MEASURED VALUES

GAP (bias) voltage indications, Digital indication of measured values

ALARM

DANGER alarm, ALERT alarm, OK alarm (NOT-OK), GAP alarm*4, System OK alarm (SYSTEM-OK), Power OK alarm (POWER-OK)

*4 Outputs as ALERT alarm.

STATUS

DANGER bypass status, Channel bypass status, Demo-mode (simulated value setting mode) status, Sequence mode status, 10-pole high-pass filter (10-pole low-cut filter) status, Peak hold status, First-out status*5, Internal bus communication abnormality status*6, Communication board install status*7

*5 Only the ALERT LED of the module first set off DANGER/ALERT alarm flashing.
*6 Only the ALERT LED on the left-end of the screen flashing.
*7 Only available of VM-7B Monitor.

SET VALUES

Channel name, Tag name, Serial number, Firmware ID*8, Monitor range, DANGER alarm set values, ALERT alarm set values

*8 Only available of VM-7B Monitor.

CONTROL FUNCTIONS

RESET INSTRUCTION

Alarm reset, Peak hold reset, First-out reset

BYPASS INSTRUCTION

DANGER bypass, Channel bypass

VM-7
MONITORING SYSTEM

SPECIFICATIONS

VM-771B MCL VIEW

Specification

OTHER FUNCTIONS

Password protection	:	Password authentication is executed to the instruction of the control operation.
Screen capture	:	Captures active screen in PNG form.
CSV output	:	The data of the trend graph under the display is output by Comma Separated Value.

SOFTWARE DISTRIBUTION MEDIA

Media : CD-ROM

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

※ The specifications and other items indicated herein are subject to change without notice.
※ All company and product names in this brochure are trademarks or registered trademarks.

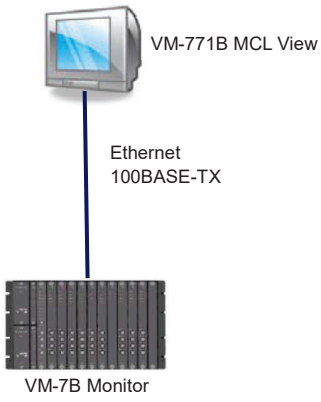
Default Value

Communication

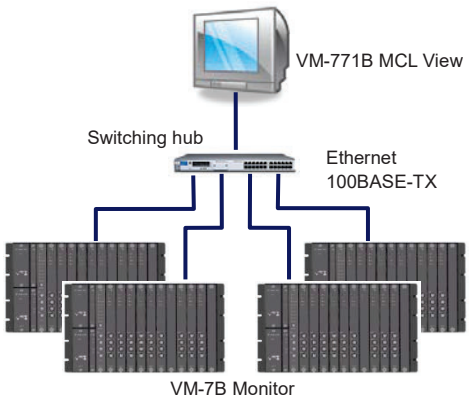
IP Address (Rack1)	:	192.168.8.8
IP Address (Rack2)	:	192.168.8.9
IP Address (Rack3)	:	192.168.8.10
IP Address (Rack4)	:	192.168.8.11
Port Number (All)	:	8888

OTHERS

System Configuration



Connecting to one VM-7B Monitor



Connecting to four VM-7B Monitor

Example of Screen

BAR GRAPH SCREEN

TREND GRAPH SCREEN

※Actual screens may differ from the images shown in this document.

infiSYS RV-200
SYSTEM

SPECIFICATION

VM-772B DEVICE CONFIG

Model Code / Additional Spec. Code (No entry if additional spec. code is not specified.)

VM-772B /SU0

Setup *1

*1 A PC is required. Setup option includes initial setup of the PC, installation of the software and PC address setting.

Specification

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

PC/AT compatible personal computer	
Processor	Intel Pentium® compatible (1GHz or higher) processor clock speed recommended
Memory	1GB or higher recommended
Display	1024 X 768 or higher-resolution is recommended
Hard disk drive	1GB of available hard-disk space
Drive	CD-ROM drive
Network	USB 2.0 / 1.1 Ethernet 100 BASE-TX

SOFTWARE REQUIREMENTS

Category	Model	Edition	Version
OS	Microsoft® Windows® XP (32bit)*2	Professional	SP3
	Microsoft® Windows® 7 (32/64bit)	Professional or higher	Any
	Microsoft® Windows® 8.1(32/64bit)	Pro or higher	Any
	Microsoft® Windows® 10 (32/64bit)	Pro or higher	Any
Others	Microsoft® Windows® installer	—	3.1 or later
	Microsoft® .NET Framework	—	3.5
	FTDI Virtual COM Port Driver (for USB)	—	Any

CONNECTION

Supported devices : VM-7B Monitor, VM-7 Monitor*2,
DAQpod DP-2000 infiSYS Data Acquisition Unit
DAQpod AP-2000 infiSYS Data Acquisition Unit
Total input : 1 device*3

*2 Modules with firmware versions V0.9.0 or later are required.
*3 The number of devices connected at the same time is limited to 1. Connected device can be changed by altering the IP address, if the connection is made via Ethernet.

COMMUNICATION (Ethernet)

Network : Ethernet 100Base-TX
Protocol : TCP/IP
※ Using Ethernet connection, the software cannot connect to devices while VM-771B MCL View is connected.

COMMUNICATION (USB)

Network : USB 2.0 / 1.1
Protocol : Serial communications

DEVICE CONFIGURATION MANAGEMENT (VM-7B Monitor)

Configuration change : Monitor Type, Channel Type
Paramter change : Parameter setting of Phaser Marker, Channel (Measurement, Alarm, Analysis), Relay, Communication, etc.
Adjustment : GAP, Measure, Zero Shift, etc.
Others : Simulated value setting (for demo-mode), Acquisition of login history, Time setting, Modbus communication setting (address assignment, scaling)

DEVICE CONFIGURATION MANAGEMENT (VM-7 Monitor)

Configuration change : Monitor Type, Channel Type
Paramter change : Parameter setting of Phaser Marker, Channel (Measurement, Alarm), Relay, Communication, etc.
Adjustment : GAP, Measure, Zero Shift, etc.
Others : Simulated Value Setting (for demo-mode), Acquisition of login history, Time setting, Modbus communication setting (address assignment, scaling)

DEVICE CONFIGURATION MANAGEMENT (DAQpod DP-2000)

Configuration change : Monitor Type, Channel Type
Paramter change : Parameter setting of Phaser Marker, Channel (Measurement, Analysis), Communication, etc.
Adjustment : GAP for phase marker board, Voltage input for analysis board, etc.
Others : Time setting

DEVICE CONFIGURATION MANAGEMENT (DAQpod AP-2000)

Configuration change : Monitor Type, Channel Type
Paramter change : Parameter setting of Phaser Marker, Channel (Measurement, Analysis), Communication, etc.
Adjustment : GAP for phase marker board, Voltage input for analysis board, etc.
Others : Time setting

OTHER FUNCTIONS

Device info. display : GAP (bias) voltage, measured value, analysis data (ampitude, phase, etc), time, etc.
Password protection : Password authentication on start-up and mode change to “Device Setup”.
Offline configuration : Createsfiles without connecting to a device.

SOFTWARE DISTRIBUTION MEDIA

Media : CD−ROM

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

OTHERS

The XML files saved on VM-772B Device Config are used for device registration on VM-773B infiSYS Analysis View.

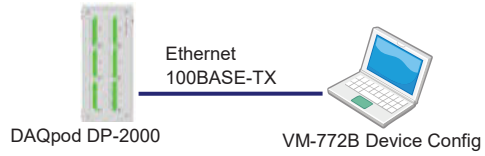
※ The specifications and other items indicated herein are subject to change without notice.

infiSYS RV-200
SYSTEM

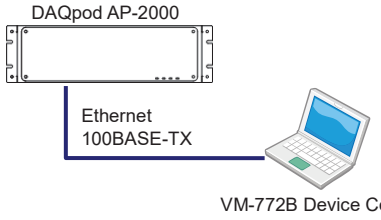
SPECIFICATION

VM-772B DEVICE CONFIG

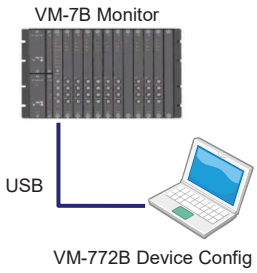
System Configuration



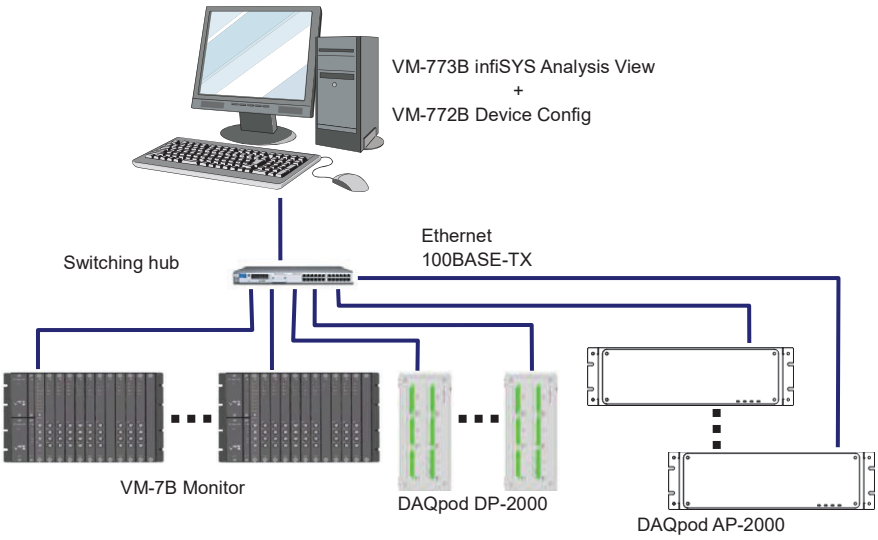
Connecting to DAQpod DP-2000 infiSYS Data Acquisition Unit
(Connecting to Ethernet port)



Connecting to DAQpod AP-2000 infiSYS Data Acquisition Unit
(Connecting to Ethernet port)



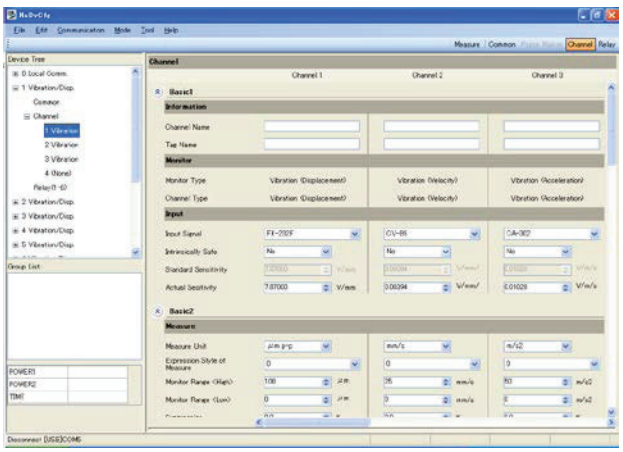
Connecting to VM-7B Monitor
(Connecting to USB port)



Connecting to multiple devices (alter the IP address to connect / configure)

Example of Screen

MAIN SCREEN



※Actual screens may differ from the images shown in this document.

作成図書改訂履歴記録 REVISION RECORD

図書番号 DWG. NO.	SPC-GIH-XVVP1-0005	図書名称 TITLE	Specification for Vibration Monitoring and Analysis System	1／2		
改訂番号 REV. NO.	改訂発行日 REV. ISSUED	改 訂 の 内 容 CHANGED PLACE AND CONTENT		承 認 APPROVED BY	調 査 CHECKED BY	担 当 PREPARED BY
0	28.Feb.2020	First Issue.		Refer to sheet 1	Refer to sheet 1	Refer to sheet 1
1	17.Jun.2020	Document Title - Added “and Analysis”. Section1.2 - Added Document and Document No. Section3 - Added Sensor Q’ty. - Revised Equipment. Fig.1 - Revised system configuration drawing. Section5.1 - Added abbreviation description. - Revised CEP/CBP Vibration sensor. - Added Remarks. Table-2～4 - Added KKS No. Table-3,4 - Added abbreviation description. Table4 - Added CEP B,CBP B. Section7.2 - Revised Display Plot. Section7.3 - Added Section. Section8 - Added Section. Section9 - Revised title. - Revised sensor type.		Refer to sheet 1	Refer to sheet 1	Refer to sheet 1
2	04.Aug.2020	system-name - Fix to VMAS. Section1.2ra - Added Document and Document No. Section3 - Revised Sensor Q’ty. Fig.1 - Revised KKS No. - Added KKS No. Table-2 - Added sensor. Table-4 - Revised KKS No. - Deleted sensor. Table-5 - Revised Range. Table-5 - Revised Range. Section7.2 - Revised Display Plot.		Refer to sheet 1	Refer to sheet 1	Refer to sheet 1

作成図書改訂履歴記録 REVISION RECORD

図書番号 DWG. NO.	SPC-GIH-XVVP1-0005	図書名称 TITLE	Specification for Vibration Monitoring and Analysis System	2／2	

改訂番号 REV. NO.	改訂発行日 REV. ISSUED	改 訂 の 内 容 CHANGED PLACE AND CONTENT	承 認 APPROVED BY	調 査 CHECKED BY	担 当 PREPARED BY
3	1.Mar.2021	Section3 - Revised Sensor Q'ty for LOT2. - Revised Equipment description. Fig.1 - Revised Q'ty of TSI cabinets. - Revised VMAS cabinet KKS No. - Added VMAS server KKS No. Section5.3~5.6 - Added specifications. Table-2～4 - Revised details of specification. - Added S.No.66~71 for Table-4. - Added abbreviation. Table-5 - Revised range for No.2. Section8 - Added M-BFP FLU CPL VIB and T-BFP RG BRG VIB. Section9 - Added VM-771B/VM-772B specification sheet.	Refer to sheet 1	Refer to sheet 1	Refer to sheet 1
4	20.Feb.2023	Section.1 - Added Reference Documents. Section.3 - Revised sensor q'ty for Coal Crusher. - Added sensor for Recovery Water Pump. Section.4 - Updated details of System Configuration. Section.5.3, 5.4,5.6 - Revised details of specification. Section.5.7 - Added specification of maintenance PC. Section.6 (Table-2,3,4) - Revised details of input signal informations. Section.7.2 - Added note. Section.8 (Rack Arrangement) -Corrected service description.	Refer to sheet 1	Refer to sheet 1	Refer to sheet 1
5	17.Mar.2023	Section.4, Fig.1 - Deleted description of "Black: Hold".	Refer to sheet 1	Refer to sheet 1	Refer to sheet 1
6	05.Apr.2023	Issued for Construction.	Refer to sheet 1	Refer to sheet 1	Refer to sheet 1