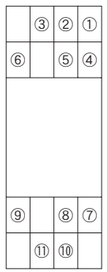
■Model Code No.

●VM-21G　Signal Conditioner Socket　VM–21G

■Specification

Model	VM-21G Signal Conditioner Socket
Terminal Screw Size	M3
Number of Mountable Signal Conditioners	1
Operating Temperature	0 to 50℃ (32 to 122℉ REF.)
Relative Humidity	10 to 90%RH (no condensation)
Installation	DIN rail, wall-mounted
External Dimensions	W29.5×H72×D30 (mm)
Casing Material (color)	Polyphenylene oxide (black)
Weight	Approx. 50g (0.11lb)
CE Marking	Only as for 24VDC power supply specifications

■Terminal Arrangement



Terminal No.	VM-21K	VM-21U	VM-21B	VM-21A	VM-21T	VM-21R		VM-21P	VM-21D	VM-21F			VM-21E
						FK input	MS input			Thermocouple	RTD	mV signal	
1	−24V				−24V	−24V		IN(A)	IN(F)	IN	A	IN	IN(+)
2	IN	IN	IN	IN	IN	IN	IN	IN(B)	IN(D/E)				
3	COM	COM	COM	COM	COM	COM	COM	IN(C)	IN(C)	COM	B	COM	COM(-)
4				WAVE		PULSE	PULSE		IN(A)		B		
5	COM	COM	COM	COM	COM	COM	COM	TP(−)	IN(B) / TP(−)				
6	BUF	BUF	BUF	BUF	BUF	BUF	BUF	TP(+)	TP(+)				
7	OUT												
8	GND												
9	COM												
10	L+												
11	N−												

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* Specifications, outline drawings and other written information can be changed without notice.

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SHINKAWA

(VIBRATION, THRUST, REVOLUTION, LVDT, TEMPERATURE, PROCESS)
SIGNAL CONDITIONER
VM-21
SERIES

SHINKAWA Sensor Technology, Inc.

VM-21 SIGNAL CONDITIONER

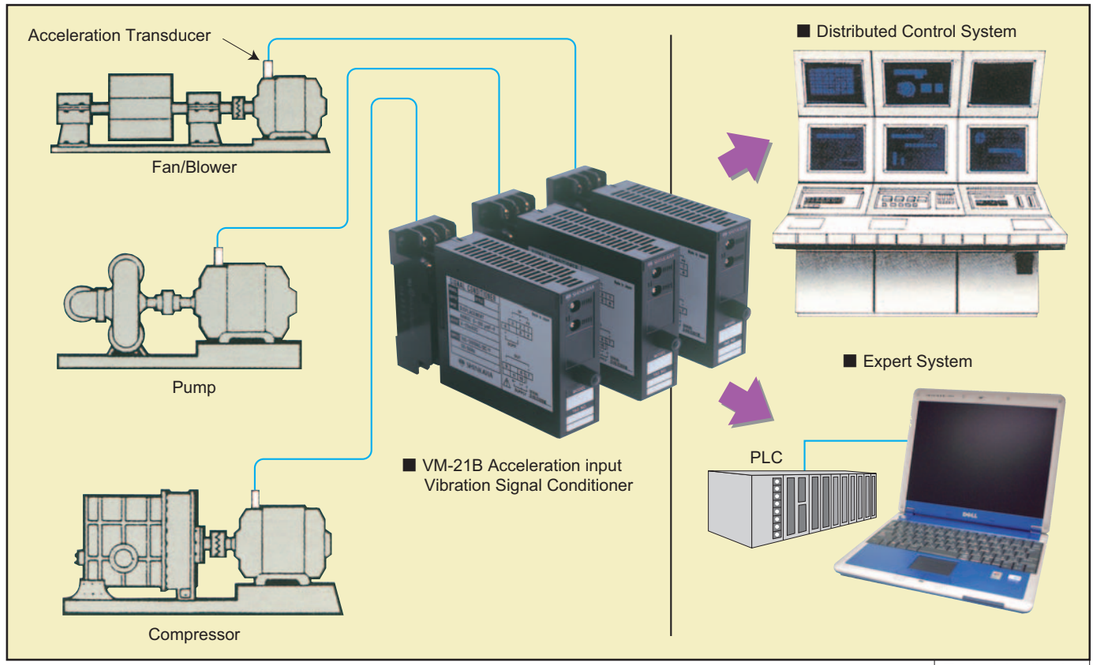
SHINKAWA Intelligent Conditioners. The Smart

The latest technology for maintaining safety in large industrial complexes. Up to now, plant maintenance was performed according to the TBM (Time Based Maintenance) system, that is, a preventive maintenance schedule was set up based on the MTBF (Mean Time Between Failures) obtained by analyzing the data of past failures.

However, examined from the aspect of cost, this method results in long maintenance cycles as well as reduced productivity and increased maintenance costs due to plant stoppages. And from the aspect of safety, the potential of an unforeseen breakdown touching off a major accident should be kept in mind. The CBM (Condition Based Maintenance) system is a new maintenance system that satisfies the difference requirements for plant safety and efficiency and has rapidly been gaining popularity in recent years.

In this system, trouble is detected early by continuous monitoring of the condition of the equipment, i. e., maintenance can be performed before trouble actually occurs. Other topical concepts aimed at unmanned maintenance and reduction of maintenance costs include centralized monitoring through continuous monitoring systems, DCS (Distributed Control System) and different means of data acquisition.

The VM-21 series, still more compact and fully geared to satisfy the requirements of engineers making the move toward continuous monitoring systems. A new trendsetter in plant maintenance.



Typical Application

■Model Code No. (Ordering Information)

Standard

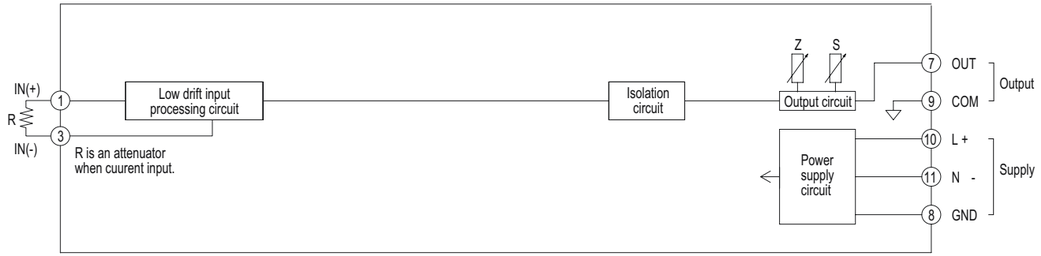
●VM-21E Process

VM-21E □-□□-□

Power supply		Measuring range		Output		Conditioner socket	
1	24VDC	1	1 to 5VDC	1	1 to 5VDC	0	Without
2	100-240VAC/DC	2	4 to 20mADC	2	4 to 20mADC	1	Include

■Block Diagram

●VM-21E Process



■Specification

Model	VM-21E Process
Input Range	1 to 5VDC, 4 to 20mADC
Input Resistance	1 to 5VDC : 1MΩ, 4 to 20mADC : 250Ω
Output (isolated)	1 to 5VDC(load resistance:2kΩ or more), 4 to 20mADC(permissible load resistance:600Ω or less) ＊1
I/O Conversion Accuracy	±0.5% of F.S. at 25℃
Response Time	τ=120ms 63% response (input change 10 to 90%)
Reception Resisntace	Attaching externally (Installation for current input)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC(50/60Hz)
Power Consumption	24VDC:2.4W, 110VDC:2.6W, 100-240VAC:7.1VA
Insulation Resistance	100MΩ minimum at 500VDC between input—output—power—GND mutually.
Withstanding Voltage	2,000VAC for one minute between input—output—power—GND mutually. (With VM-21H : 1,000VAC between output—GND.)
Operating Temperature	0 to 50℃ (32 to 122℉ REF)
Relative Humidity	10 to 90%RH(no condensation)
Casing Material (color)	Modified polyphenylene oxide(black)
Wight	Approx. 116g(0.26lb)
CE Marking	Only as for 24VDC power supply specifications.

＊1 The output mode is not changeable on the field.
※ Specifications, outline drawings and other written information can be changed without notice.

■ Model Code No. (Ordering Information)

Standard

●VM-21K Displacement Input Vibration

VM–21K □–□□ B 1 □–□

Power supply		Measuring range		Input transducer		Frequency response		Output		Conditioner socket	
1	24VDC	21	0 to 100μm pk-pk	B	FK-202F VK-202A (787mV/100μm)	1	5Hz to 4kHz (−3dB)	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	22	0 to 125μm pk-pk					2	4 to 20mADC	1	Include
		23	0 to 200μm pk-pk								

●VM-21U Velocity Input Vibration

VM–21U □–□□ V □□–□

Power supply		Measuring range*1		Input transducer		Frequency response		Output		Conditioner socket	
1	24VDC	21	0 to 100μm pk-pk	V	CV-86 (3.94mV/mm/s pk)	1	10Hz to 2kHz (−3dB)	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	22	0 to 200μm pk-pk			2	20Hz to 2kHz (−3dB)	2	4 to 20mADC	1	Include
		61	0 to 25mm/s pk								
		62	0 to 50mm/s pk								

*1 In the measuring ranges for displacement vibration measurement (e.g., 0 to 100μm pk-pk), it has possibility that the monitor also picks up low-frequency vibrations from the surroundings, such as transmitted by the piping and foundation, so that the output may be greater than the vibrations produced by the monitored object itself.

●VM-21B Acceleration Input Vibration

VM–21B □–□□ A □□–□

Power supply		Measuring range*1				Input transducer		Frequency response		Output		Conditioner socket	
		Velocity		Acceleration									
1	24VDC	20	0 to 15mm/s pk	61	0 to 2g pk	A	CA Series (100mV/9.8m/s² pk)	1	10Hz to 5kHz (−3dB) (Velocity output)	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	21	0 to 25mm/s pk	62	0 to 5g pk			2	1kHz to 10kHz (−3dB) (Acceleration output)	2	4 to 20mADC	1	Include
		22	0 to 50mm/s pk	63	0 to 10g pk			3	20Hz to 5kHz (−3dB) (Velocity output)				
		23	0 to 100mm/s pk	64	0 to 20g pk								
				71	0 to 20m/s² pk								
				72	0 to 50m/s² pk								
				73	0 to 100m/s² pk								
				74	0 to 200m/s² pk								

*1 In the measuring ranges for velocity vibration measurement (e.g., 0 to 15mm/s pk), it has possibility that the monitor also picks up low-frequency vibrations from the surroundings, such as transmitted by the piping and foundation, so that the output may be greater than the vibrations produced by the monitored object itself.

●VM-21A Vibration

VM–21A □–□□□□□□–□

Power supply		Measuring range*1				Input transducer		Frequency response		Wave Output*3		Output		Conditioner socket	
1	24VDC	11	0 to 100 μm pk	61	0 to 2g pk	A	CA Series (100mV/9.8m/s² pk)	1	10Hz to 2kHz (−3dB)	1	Velocity	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	12	0 to 200 μm pk	62	0 to 5g pk			2	5Hz to 1kHz (−3dB)	2	Acceleration	2	4 to 20mADC	1	Include
		21	0 to 25mm/s pk	63	0 to 10g pk	V	CV-86 or CV-88 (3.94mV/mm/s pk)	3	10Hz to 1kHz (−3dB)	3	Displacement				
		22	0 to 50mm/s pk	64	0 to 20g pk			4	10Hz to 5kHz (−3dB)						
		23	0 to 100mm/s pk	71	0 to 20m/s² pk			5	1kHz to 10kHz (−3dB)						
				72	0 to 50m/s² pk										
				73	0 to 100m/s² pk										
				74	0 to 200m/s² pk										

*1 Input transducer is A : Can not select 11 and 12 of measuring range.
Input transducer is V : Can not select 61 and 64, 71 and 74 of measuring range.
*2 When the input transducer V, frequency response code 0 (standard), 3 or 4 is highly recommended.
When the frequency response code 1 or 2 is selected, an excessive vibration output may result at low-frequency.
*3 Input transducer is A : Can not select 3 of waveform output.
Input transducer is V : Can not select 2 of waveform output.

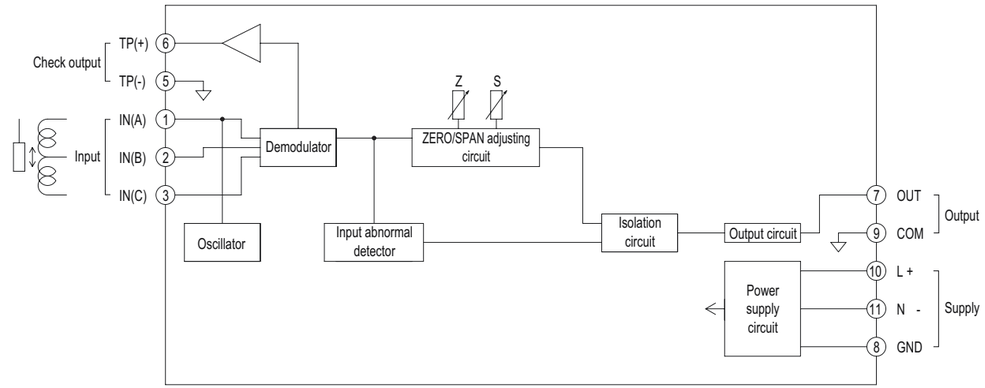
■Specification

Model	VM-21K Displacement Input Vibration	VM-21U Velocity Input Vibration	VM-21B Acceleration Input Vibration	VM-21A Vibration
Input Transducer	FK-202F, VK-202A	CV-86	CA-302, CA-721, CA-722	CA-302, CA-721, CA-722 or CV-86, CV-88
Input Sensitivity	787mV/100μm	3.94mV/mm/s pk	100mV/9.8m/s² pk (100mV/g pk REF.)	3.94mV/mm/s pk 100mV/9.8m/s² pk (100mV/g pk REF.)
Input Resistance	50kΩ			
Measuring Range	See Model Code above			
Output (isolated)	1 to 5VDC (output resistance : 250Ω) or 4 to 20mADC (permissible load resistance : 600Ω or less)			
I/O Conversion	±1% of F.S. at 25℃, ±2% of F.S. at 0 to 50℃			
Response Speed	τ=500ms, 63% response			
Frequency Response	5Hz to 4kHz (−3dB)	10Hz to 2kHz (−3dB) or 20Hz to 2kHz (−3dB)	Vel. output :10Hz to 5kHz (−3dB) or 20Hz to 5kHz (−3dB) Acc. output :1kHz to 10kHz (−3dB)	5Hz to 1kHz (−3dB), 10Hz to 2kHz (−3dB) 5Hz to 10kHz (−3dB), 10Hz to 1kHz (−3dB) 10Hz to 5kHz (−3dB), 1kHz to 10kHz (−3dB)
Burn-down Function	Detects transducer failure and causes the 4 to 20mADC (1 to 5VDC) output to go to less than 0.8mADC (0.2VDC).			
Buffered Output	Input signal is outputted via a buffer amplifier. Signal level :−2 to −22VDC Output impedance:100Ω	Input signal is outputted via a buffer amplifier. Signal level :2 to 22VDC Output impedance:100Ω		
Wave Output	—			5Vpk-pk at F.S. (Sine wave)
Power Supply Output	−24VDC (30mA with short-circuit protection)	24VDC (4mA constant current)		
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)			
Power Consumption	24VDC:3.5W, 110VDC:3.5W, 100-240VAC:10VA			
Insulation Resistance	100MΩ minimum at 500VDC between input—output—power—GND mutually.			
Withstanding Voltage	2,000VAC for one minute between input—output—power—GND mutually. (with VM-21H : 1,000VAC between output—GND.)			
Operating Temperature	0 to 50℃ (32 to 122℉ REF.)			
Relative Humidity	10 to 90%RH (no condensation)			
Casing Material	Modified polyphenylene oxide (black)			
Weight	Approx. 110g (0.24lb)			
CE Marking	Only as for 24VDC power supply specifications.			

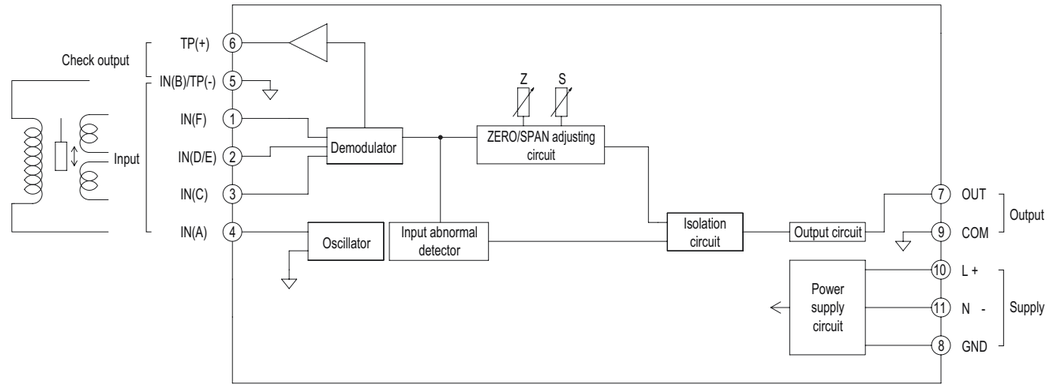
※ Specifications, outline drawings and other written information can be changed without notice.

■Block Diagram

●VM-21P 3-Wire LVDT (LS Series)



●VM-21D 6-Wire LVDT (LF Series)



■Model Code No. (Ordering Information)

Standard

●VM-21T Thrust

VM-21T □-□□□□□□□-□

Power supply		Measuring range*1*2		Input transducer		Intrinsically safe		Polarity*3		Output		Conditioner socket	
1	24VDC	21	0 to 2mm	B	FK-202F VK-202A (787mV/100μm)	0	Non-intrinsically safe spec.	0	Direct	1	1 to 5VDC	0	Without
2	100-240VAC/DC	22	0 to 4mm					1	Reverse	2	4 to 20mADC	1	Include
				C	FK-452F VK-452A (394mV/100μm)	1	Intrinsically safe spec.						

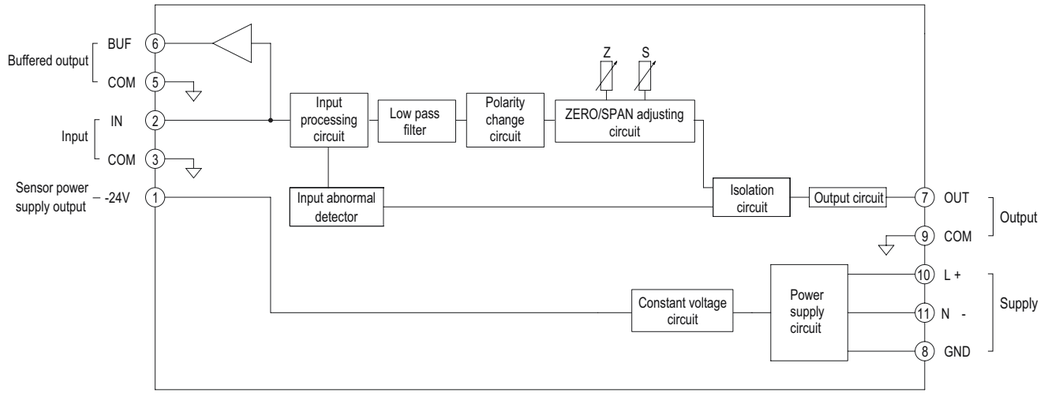
Note)＊1 In the case of Intrinsic safety specification, measuring range decrease as below,
0 to 1.8mm (Input transducer : B),
0 to 3.6mm (Input transducer : C).
＊2 Input transducer is B : Don't select 22 of measuring range.
Input transducer is C : Don't select 21 of measuring range.

Note) ＊3 Polarity

Polarity	Display and recorder output	
	In the direction toward the sensor	In the direction away from the sensor
Direct	Increase	Decrease
Reverse	Decrease	Increase

■Brock Diagram

●VM-21T Thrust



■Specification

Model	VM-21T Thrust
Input Transducer	FK-202F, VK-202A, FK-452F, VK-452A
Input Sensitivity	787mV/100μm (FK-202F, VK-202A), 394mV/100μm (FK-452F, VK-452A)
Input Resistance	50kΩ
Measuring Range	See Model Code No. above
Output (isolated)	1 to 5VDC（output resistance：250Ω）or 4 to 20mADC（permissible load resistance：600Ω or less）
I/O Conversion Accuracy	±1% of F.S. at 25℃, ±2% of F.S. at 0 to 50℃
Response Speed	τ＝50ms 63% response (input change 10 to 90%)
Burn-down Function	Detects transducer failure and causes the 4 to 20mADC (1 to 5VDC) output to go to less than 0.8mADC (0.2VDC).
Buffered Output	Input signal is outputted via a buffer amplifier. Signal level ：−2 to −22VDC Output impedance：100Ω
Power Supply Output	−24VDC（30mA with short-circuit protection）
Zero-shift	−20% (±5%) to 0 to +20% (±5%) of F.S.
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC（50/60Hz）
Power Consumption	24VDC：6.0W, 110VDC：6.0W, 100-240VAC：20VA
Insulation Resistance	100MΩ minimum at 500VDC between input—output—power—GND mutually.
Withstanding Voltage	2,000VAC for one minute between input—output—power—GND mutually. （with VM-21H : 1,000VAC between output—GND.）
Operating Temperature	0 to 50℃ (32 to 122℉ REF.)
Relative Humidity	10 to 90%RH（no condensation）
Casing Material (color)	Modified polyphenylene oxide (black)
Weight	Approx. 110g（0.24lb）
CE Marking	Only as for 24VDC power supply specifications.

※ Specifications, outline drawings and other written information can be changed without notice.

■Model Code No. (Ordering Information)

Standard

●VM-21R Revolution

VM-21R □-□□□□□□□-□

Power supply		Measuring range		No. of input P/R	Input transducer		Output		Conditioner socket	
1	24VDC	21	0 to 5,000rpm	ex.1) 120P/R 1 2 0 ex.2) When specifiying without an integral numbers. Z Z Z Specify No. of input P/R for the shaft observed by sensor. P/R	D	RD Tacho Driver FK Driver VK Driver ＊1	1	1 to 5VDC	0	Without
2	100-240VAC/DC	22	0 to 10,000rpm				2	4 to 20mADC	1	Include
		23	0 to 15,000rpm		J	MS Magnetic Pickup				
		24	0 to 20,000rpm							
		25	0 to 50,000rpm							
		26	0 to 100,000rpm							

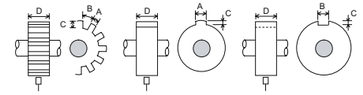
Note) ＊1 VK transducer can not detect break in the sensor system, so RD tacho driver or FK driver wichi can detect the wire break shall recommended.

Note) Normal operating range is,

$$10\text{Hz} \leqq \frac{\text{Max. rotor speed(rpm)} \times \text{No. of P/R}}{60} \leqq 10\text{kHz}$$

⚠WARNING
This signal conditioner is designed for monitoring but not for controlling the rotor speed.
・Use the conditioner output only for date recording.
・Do not use this signal for zero-speed monitoring.

● Dimension of Target (Model FK, VK, RD)



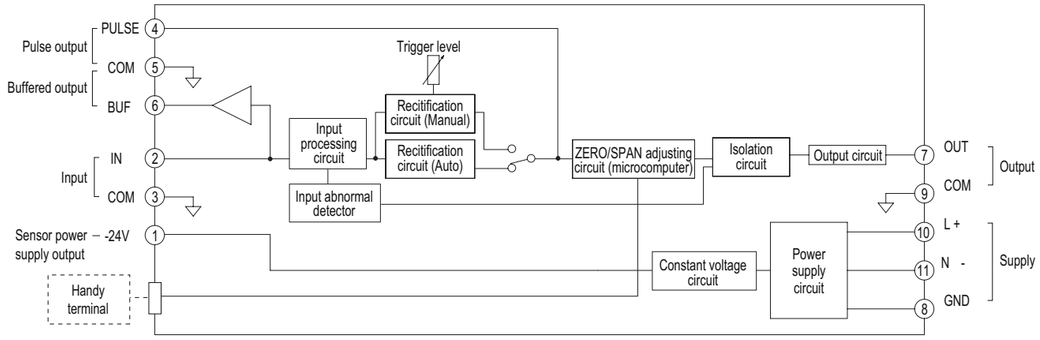
Note) To detect projection (gear), provide surface A of projection with a concentric curve. Do not make it flat.

A=_____ mm
B=_____ mm
C=_____ mm
D=_____ mm

	Input	FK-202F VK-202A RD-05A	FK-452F VK-452A	VK-302P	VK-602P
Dimension of target [recommended] (mm)	A	≧6	≧16	≧8	≧18
	B	≧7	≧20	≧8	≧20
	C	≧2.5	≧4.5	≧2.5	≧5.0
Set gap [recommended] (mm)	D	≧16	≧36	≧20	≧40
		1.0 to 1.5	2.5 to 3.5	1.0 to 1.5	2.5 to 3.5

■Block Diagram

●VM-21R Revolution



■Specification

Model	VM-21R Revolution
Input Transducer	RD series, FK series, VK series, MS series
Input Resistance	50kΩ (Model Code No. of input transducer "D"), 5kΩ (Model Code No. of input transducer "J")
Input Frequency	Min. Input frequency : 0.01Hz, Max. Input frequency : 10kHz, Min Pulse width : 50μsVp-p
Minimum Input Voltage	2Vp-p
Hysteresis	1Vp-p, 5Vp-p
Output (isolated)	1 to 5VDC(output resistance：250Ω) or 4 to 20mADC(permissible load resistance：600Ω or less)
Measuring Range	See Model Code No. above
I/O Conversion Accuracy	±1% of F.S. at 25℃, ±2% of F.S. at 0 to 50℃
Buffered Output	Model Code No. of input transducer "D" : Approx. −2 to −22VDC, Model Code No. of input transducer "J" : Approx. −10 to 10VDC
Pulse Output	V_L : 0V, V_H : 5V
Trigger Lovel Setting＊2	Automatic (trigger level is adjustable by internal trigger level V.R.)
Power Supply Output	−24VDC, approx. 30mA (for Model Code No. of input transducer "D")
Burn-down Function	Detects transducer failure and causes the 4 to 20mADC (1 to 5VDC) output to go to less than 0.8mADC (0.2VDC).
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC(50/60Hz)
Power Consumption	24VDC：5.0W, 110VDC：5.0W, 100-240VAC：10VA
Insulation Resistance	100MΩ minimum at 500VDC between input—output—power—GND mutually
Withstanding Voltage	2,000VAC for one minute between input—output—power—GND mutually. (with VM-21H : 1,000VAC between output—GND)
Operating Tmeprature	0 to 50℃ (32 to 122℉ REF.)
Relative Humidity	10 to 90%RH (no condensation)
Casing Material (color)	Modified polyphenylene oxide (black)
Weight	Approx. 110g(0.24lb)
CE Marking	Only as for 24VDC power supply specifications.

＊2 Measuring by manual trigger is recommended in case that duty ratio of input signal is without 10 to 90% or input frequency is measured under 1 to 10Hz.
※ Specifications, outline drawings and other written information can be changed without notice.

■ Model Code No. (Ordering Information)

Standard

●VM-21P 3-Wire LVDT (LS Series)

VM-21P □-□□ S □□□□-□

Power supply		Measuring range		Input LVDT		Full range of input LVDT		Output		Conditioner socket	
1	24VDC	20	25mm	S	LS Series	050	50mm	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	21	50mm			100	100mm	2	4 to 20mADC	1	Include
		22	75mm			150	150mm				
		23	100mm			200	200mm				
		24	150mm			250	250mm				
		25	200mm			300	300mm				
		26	250mm			350	350mm				
		27	300mm			400	400mm				
		28	350mm			450	450mm				
		30	400mm								
		31	450mm								

Note) ・Standard specifications, when measuring range and full range of input LVDT are the same.
・Satisfy the following when using LS Series LVDT :

$$1 \leqq \frac{\text{Full range of input LVDT}}{\text{Measuring range}} \leqq 2$$

・Satisfy the following when using single coil type LVDT except LS Series LVDT :
1) Impedance (between A and C): At 50% (Null point) 500 to 700Ω; Within LVDT stroke More than 400Ω; Core comes out Less than 250Ω
2) 4.33×LVDT sensitivity (mV/mm/V)×Measuring range (mm)≧1,000
・This signal conditioner does not support the zero shift function, so the null point is always the center position of measurement.

●VM-21D 6 -Wire LVDT (LF Series)

VM-21D □-□□ F □□□□

Power supply		Measuring range		Input LVDT		Full range of input LVDT		Output	
1	24VDC	21	50mm	F	LF Series	100	100mm	1	1 to 5VDC
2	100 to 240VAC/DC	23	100mm			250	250mm	2	4 to 20mADC
		24	150mm			300	300mm		
		25	200mm			400	400mm		
		26	250mm						
		27	300mm						
		30	400mm						

Note) ・Standard specifications, when measuring range and full range of input LVDT are the same.
・Satisfy the following when using LF Series LVDT :

$$1 \leqq \frac{\text{Full range of input LVDT}}{\text{Measuring range}} \leqq 2$$

・This signal conditioner does not support the zero shift function, so the null point is always the center position of measurement.

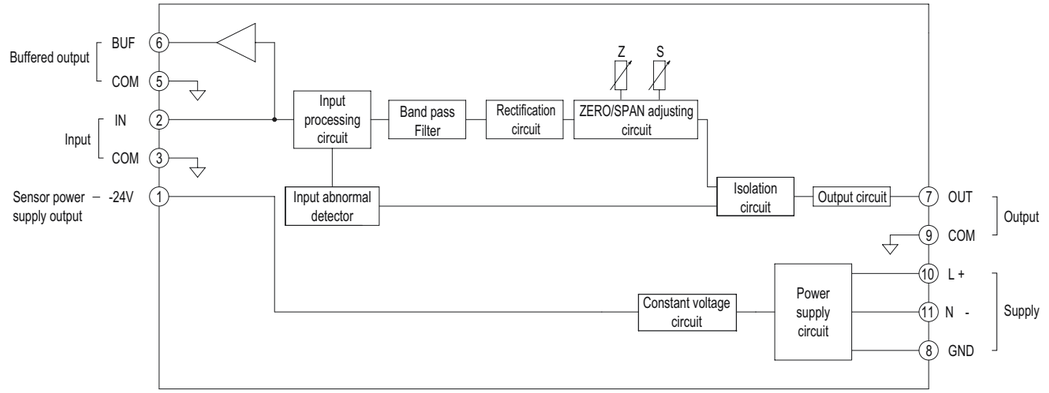
■Specification

Model	VM-21P 3-Wire LVDT	VM-21D 6-Wire LVDT
Input LVDT	LS Series	LF Series
Measuring Range	See Model Code above	
Output (isolated)	1 to 5VDC (output resistance：250Ω) or 4 to 20mADC (permissible load resistance：600Ω or less)	
I/O Conversion Accuracy	±1% of F.S. at 25℃, ±2% of F.S. at 0 to 50℃ Deviation from an ideal linear output of voltage or current in combination with LS Series LVDT. However, when measuring range and full range of input LVDT are the same.	±1.5% of F.S. at 25℃, ±3% of F.S. at 0 to 50℃ Deviation from an ideal linear output of voltage or current in combination with LF Series LVDT. However, when measuring range and full range of input LVDT are the same.
Response Speed	τ＝45ms, 90% response	
Polarity	Can be changed by wiring	
Burn-down Function※1	Detects transducer failure and causes the 4 to 20mADC (1 to 5VDC) output to go to less than 0.8mADC (0.2VDC)	
T.P. Output (test point output for confirmation null point)	Output 0V when core position is on Null point. Output impedance：100Ω	Output 0V when core position is on Null point. Output impedance：1kΩ
Output for LVDT Excitation	Voltage : 5Vrms, Frequency : 3kHz, Max. current : 50mA, Sine wave	Voltage : 7Vrms, Frequency : 1kHz, Max. current : 35mA, Sine wave
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)	
Power Consumption	24VDC : 3.5W, 110VDC : 3.5W, 100-240VAC : 10VA	
Insulation Resistance	100MΩ minimum at 500VDC between input—output—power—GND mutually.	
Withstanding Voltage	2000VAC for one minute between input—output—power—GND mutually. (with VM-21H : 1,000VAC between output—GND.)	
Operating Temperature	0 to 50℃ (32 to 122℉ REF.)	
Relative Humidity	10 to 90%RH (no condensation)	
Casing Material (color)	Modified polyphenylene oxide (black)	
Weight	Approx. 110g (0.24lb)	
CE Marking	Only as for 24VDC power supply specifications.	

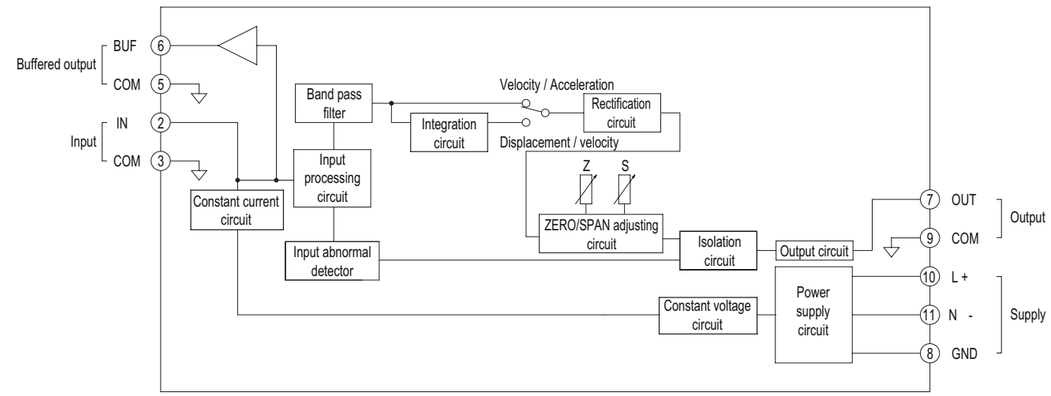
*1 Abnormal condition
・When there is an abnormality in the LVDT or signal cable (breaking in LVDT wiring, breaking or short circuit in signal cable). However, VM-21D may be some instances where these conditions will not be detected.
・When there is an abnormality in LVDT excitation output (oscillation has stopped).

■Block Diagram

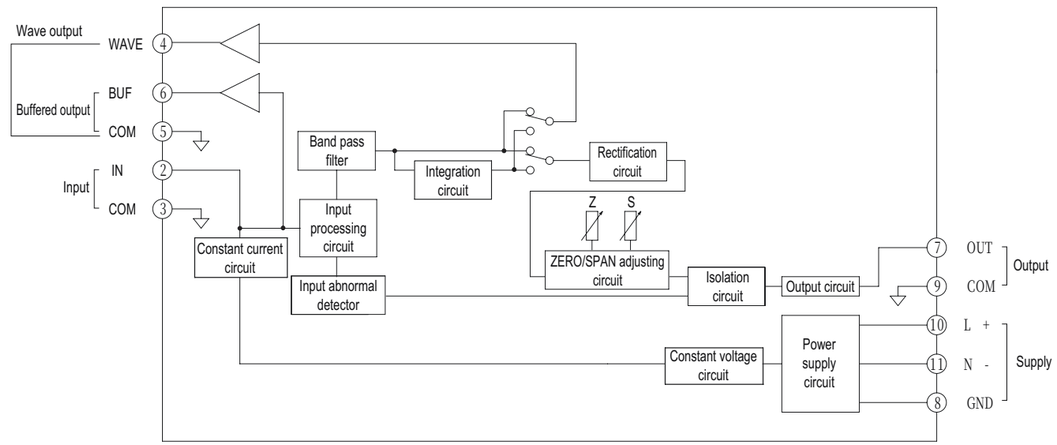
●VM-21K Displacement Input Vibration



●VM-21U Velocity Input Vibration / VM-21B Acceleration Input Vibration



●VM-21A Vibration



■Model Code No. (Ordering Information)

Standard

●VM-21F Temperature

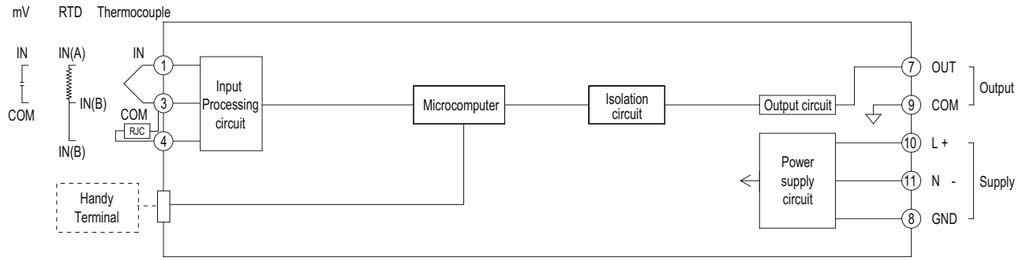
VM-21F □-□□□□-□

Power supply		Measuring range		Input transducer*1				Output		Conditioner socket	
1	24VDC	1	0 to 100℃	TK	Thermocouple Type K	R1	Pt100(ITS-90)	1	1 to 5VDC	0	Without
2	100-240VAC/DC	9	Other	TE	Thermocouple Type E	R2	PT100(IPTS-68)	2	4 to 20mADC	1	Include
				TJ	Thermocouple Type J	R3	JPt100(JIS'89)				
				TT	Thermocouple Type T	R4	Pt50(JIS'81)				
				TR	Thermocouple Type R	MV	mV signal (DC voltage)				
				TS	Thermocouple Type S						
				TB	Thermocouple Type B						
				TN	Thermocouple Type N						
				TX	Thermocouple Type W3						
				TY	Thermocouple Type W5						

Note) ＊1 Not applicable for 4-wire RTD.

■Block Diagram

●VM-21F Temperature



■Specification

Model	VM-21F Temperature
Input Transducer	Thermocouple, RTD and mV signal (DC voltage)
Input Resistance	1MΩ(When Input Transducer is Thermocouple or mV signal)
Input External Resistance	Thermocouple, mV signal : 500Ω or less Note : when combination with barrier (BARD600 : YOKOGAWA), it is the value connectable as external resistance besides internal resistance. RTD : input span (℃)×0.4Ω or less / wire Note : when combination with barrier (BARD700 : YOKOGAWA), it is the value connectable as external resistance besides internal resistance.
RTD Detective Current	Approx. 0.5mADC
Permissible Applicable Voltage	±4VDC or less
Measuring Range	Thermocouple Type K : -200 to 1200℃ Type E : -200 to 800℃ Type J : 0 to 750℃ Type T : -200 to 350℃ Type R : 0 to 1600℃ Type S : 0 to 1600℃ Type B : 600 to 1700℃ Type N : -200 to 1200℃ Type W3 : 0 to 2000℃ Type W5 : 0 to 2000℃ RTD Pt100(ITS-90) : -200 to 660℃ PT100(IPTS-68) : -200 to 660℃ JPt100(JIS'89) : -200 to 510℃ Pt50(JIS'81) : -200 to 649℃ mV signal : -10 to 100mVDC
Measuring span	Thermocouple, mV signal : 3mV or more, RTD : 10℃ or more
Output (isolated)	1 to 5VDC(load resistance:2kΩ or more), 4 to 20mADC(permissible load resistance:600Ω or less)＊2
I/O Conversion Accuracy	±0.1% of F.S. at 25℃ Note : This value is limited in the following cases. <Input Transducer : Thermocouple> Input range is -10 to 100mV, span is under 27.5mV, in thermally generated emf conversion. Accuracy(%)=±0.1%×27.5mV/Input span[mV] Input range is -2.5 to 25mV, span is under 10mV, in thermally generated emf conversion. Accuracy(%)=±0.1%×10mV/Input span[mV] <Input Transducer : RTD> Input range is 0 to 520Ω, span is under 130Ω (refer to the reference resistance table) Accuracy(%)=±0.1%×130Ω/Input span[Ω] Input range is 0 to 176Ω, span is under 38.6Ω (refer to the reference resistance table) Accuracy(%)=±0.1%×38.6Ω/Input span[Ω]
Reference Junction Compensation for Thermocouple	Attaching externally
Reference Junction Compensation Accuracy	±1℃ (except for Type R, S) ; ±2℃ (Type R, S) for terminal temperature 25℃±15℃
Response Speed	τ=160ms, 63% response (input change 10 to 90%)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC(50/60Hz)
Power Consumption	24VDC:2.5W, 110VDC:2.9W, 100-240VAC:6.7VA
Insulation Resistance	100MΩ minimum at 500VDC between input—output—power—GND mutually.
Withstanding Voltage	2,000VAC for one minute between input—output—power—GND mutually. (with VM-21H : 1,000VAC between output—GND.)
Operating Temperature	0 to 50℃ (32 to 122°F REF.)
Relative Humidity	10 to 90%RH (no condensation)
Casing Material (color)	Modified polyphenylene oxide (black)
Weight	Approx. 170g (0.37lb)
CE Marking	Only as for 24VDC power supply specifications.

＊2 The output mode is not changeable on the field.

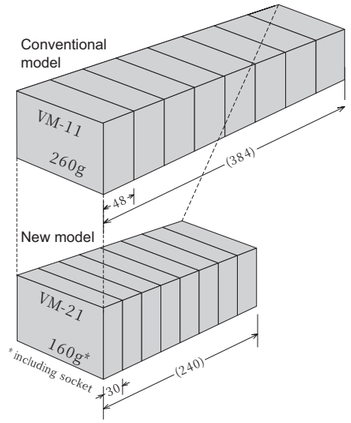
※ Specifications, outline drawings and other written information can be changed without notice.

Choice For Continuous Monitoring Predictive Maintenance

Small and light-weight

With the use of VM-21G stand-alone sockets, the VM-21 signal conditioners require the space of mere 30mm width for mounting. VM-21 only weights 100g, and it has achieved the total minimization.

【Example of 8 module mounting】



Mounting density : Down to 5/8
Weight ratio : Down to 8/13

Selectable mounting types

Both the wall-mounting and DIN-Rail-mounting are available with VM-21G stand-alone socket for an easy mounting design.

Waveform output for machine diagnostics

VM-21 has buffered output of raw waveform signal available for diagnostics of rotating machinery. The signal can be sent to analysis and diagnostics equipment for spectral and vector analysis.

Wide module lineup to meet various vibration sensors

VM-21 product lineup caters for various vibration sensors of displacement, velocity and acceleration.

Power supply options

A variety of power supplies are available: 100 to 240VAC, 100 to 24VDC and 24VDC.

Burn-down function

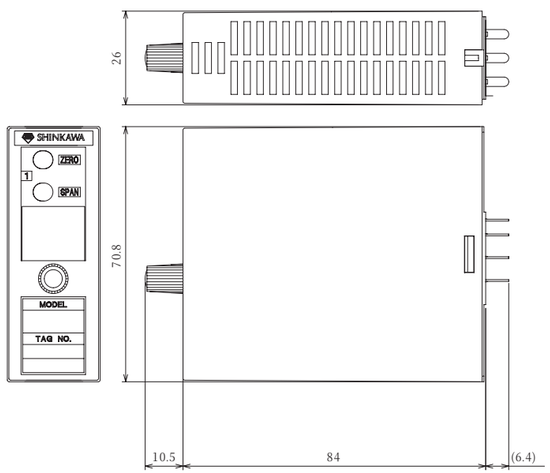
Each of VM-21 module has an input abnormal detecting function, which sends out burn-down output (less than 0.8mADC or 0.2VDC) as soon as input abnormality, such as sensor breaking, occurs. This special feature can be a great contribution to the reliability of a plant operation.

Isolated output signal

Each module of VM-21 has isolation circuit. This prevents such trouble as unstable output from signal cross-talking, often found in the instrumentation field.

■ Outline Drawing

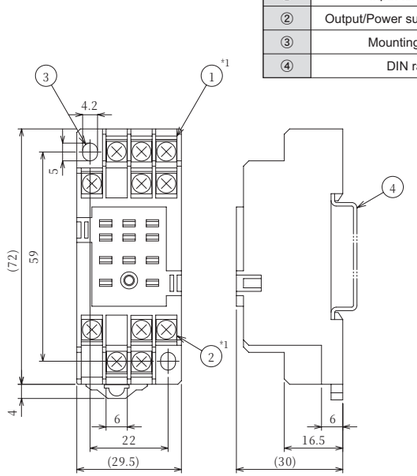
●VM-21□ Signal Conditioner



Dimension : mm

●VM-21G Signal Conditioner Socket

No.	Name
①	Input terminal
②	Output/Power supply terminal
③	Mounting hole
④	DIN rail



*1 Refer to specifications page on terminal arrangement.

Dimension : mm