VM-21 SERIES

SPECIFICATIONS

VM-21K
DISPLACEMENT INPUT
VIBRATION SIGNAL CONDITIONER

CE

Model Code

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								

Standard

SPECIFICATIONS

Input Transducer	FK-202F, VK-202A
Input Sensitivity	787mV/100μm
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 Accuracy	±1% of F.S. at 25°C, ±2% of F.S. at 0 to 50°C
Response Speed	τ=500ms, 63% response
Frequency Response	5Hz to 4kHz (-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
Power Supply Output	-24VDC (30mA with short-circuit protection)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 3.5W, 100-240VDC: 3.5W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ 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°C (32 to 122°F 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.

VM-21 SERIES

SPECIFICATIONS

VM-21B
ACCELERATION INPUT
VIBRATION SIGNAL CONDITIONER

CE

Model Code

VM-21B □

Power supply	
1	24VDC
2	100 to 240VAC/DC

-□□A□□-□

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

Standard

*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.

SPECIFICATIONS

Input Transducer	CA-302,CA-721, CA-722
Input Sensitivity	100mV/9.8m/s^2 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 Accuracy	±1% of F.S. at 25°C, ±2% of F.S. at 0 to 50°C
Response Speed	τ=500ms, 63% response
Frequency Response	Vel. Output : 10Hz to 5kHz (-3dB) or 20Hz to 5kHz (-3dB) Acc. Output : 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
Power Supply Output	24VDC (4mA constant current)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 3.5W, 100-240VDC: 3.5W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ minimum at 500VDC between input-output-power-GND mutually.
Withstand Voltage	2000VAC for one minute between input-output-power-GND mutually. (With VM-21H: 1,000VAC between output-GND.)
Operating Temperature	0 to 50°C (32 to 122°F 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.

VM-21 SERIES

SPECIFICATIONS

VM-21U
VELOCITY INPUT
VIBRATION SIGNAL CONDITIONER

CE

Model Code

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/mms 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								

Standard

*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.

SPECIFICATIONS

Input Transducer	CV-86
Input Sensitivity	3.94mV/mm/s pk
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 Accuracy	±1% of F.S. at 25°C, ±2% of F.S. at 0 to 50°C
Response Speed	τ=500ms, 63% response
Frequency Response	10Hz to 2kHz(-3dB) or 20Hz to 2kHz(-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
Power Supply Output	24VDC (4mA constant current)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 3.5W, 100-240VDC: 3.5W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ 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°C (32 to 122°F 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.

VM-21 SERIES

SPECIFICATIONS

VM-21A
VIBRATION SIGNAL CONDITIONER

CE

Model Code

VM-21A □ - □□□□□□ - □

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

Standard

Note) *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 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.

SPECIFICATIONS

Input Transducer	CA-302,CA-721,CA-722 or CV-86,CV-88
Input Sensitivity	100mV/9.8m/s^2 pk (100mV/g pk REF.)(standard), 3.94mV/mm/s pk(nonstandard)
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 Accuracy	±1% of F.S. at 25°C, ±2% of F.S. at 0～50°C
Response Speed	τ＝500ms 63% response
Frequency Response	5Hz to 1kHz(－3dB), 10Hz to 2kHz(－3dB) or 5Hz to 10kHz(－3dB) 10Hz～1kHz(－3dB), 10Hz～5kHz(－3dB),1kHz～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
Wave Output	5Vpk-pk at F.S.(Sine wave)
Power Supply Output	24VDC (4mA constant current)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 3.5W, 100-240VDC: 3.5W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ minimum at 500VDC between input-output-power-GND mutually.
Withstand Voltage	2000VAC for one minute between input-output-power-GND mutually. (With VM-21H: 1,000VAC between output-GND.)
Operating Temperature	0 to 50°C (32 to 122°F 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.

VM-21 SERIES

SPECIFICATIONS

VM-21T DISPLACEMENT INPUT THRUST SIGNAL CONDITIONER

CE

Model Code No.

VM-21T □ - □□□□□□ - □

Power supply		Measuring range*1*2		Input transducer		Intrinsically safe		Polarity*3		Output		Conditioner socket	
1	24VDC	21	Non-intrinsically safe spec. : 0 to 2mm intrinsically safe spec. : 0 to 1.8mm	B	FK-202F VK-202A (787mV/100μm)	0	Non-intrinsically safe spec.	0	Direct	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC							1	Reverse	2	4 to 20mADC	1	Include
		22	Non-intrinsically safe spec. : 0 to 4mm intrinsically safe spec. : 0 to 3.6mm	C	FK-452F VK-452A (394mV/100μm)	1	Intrinsically safe spec.						

Standard

Note) *1 In the case of Intrinsic safety specification, measuring range 0～90% / 1～5V (4～20mA)

*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

SPECIFICATIONS

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)	4 to 20mADC (max. load resistance : 600Ω) or 1 to 5VDC (output resistance : 250Ω)
I/O Conversion Accuracy	±1% of F.S. at 25°C, ±2% of F.S. at 0 to 50°C
Response Time	τ=50ms, 63% response(input change 10 to 90%)
Burn-down Function	When the signal conditioner detect transducer failure or causes, the 4 to 20mADC (1 to 5VDC) output to go to less than 0.8mADC (0.2VDC).
Buffered Output	Input signal is output 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 Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 3.5W, 100-240VDC: 3.5W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ 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°C (32 to 122°F 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.

VM-21SERIES

SPECIFICATIONS

VM-21R
REVOLUTION SIGNAL CONDITIONER

CE

Model Code No.

VM-21R □ - □□□□□□□□ - □

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

Standard

注) *1 VK transducer can not detect break in the sensor system, so RD tacho driver or FK driver which 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.

SPECIFICATIONS

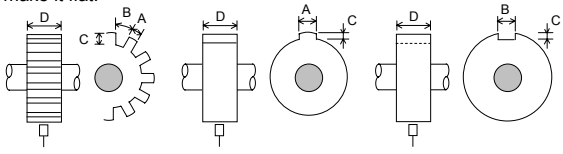
Input Transducer	RD SERIES , FK SERIES , VK SERIES, MS SERIES
Input Resistance	50kΩ(Model Code No. of input transducer “D”),5kΩ(Model Code No. of input transducer “J”)
Input Frequency	Min.Input frequency：0.01Hz , Max.Input frequency：10kHz , Min pulse width：50μs
Minimum input voltage	2Vp-p
Hysteresis	1Vp-p , 5Vp-p
Output(isolated)	1 to 5VDC(output resistance：250Ω) or 4～20mADC(permissible load resistance：600Ω or less)
Measuring Range	See Model Code No. above
I/O Conversion Accuracy	±1% of F.S. at 25°C, ±2% of F.S. at 0～50°C
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：-1 to +1V, V_H：4 to 6V
Trigger level 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	4 to 20mADC (1 to 5VDC) output to go to less than 0.8mADC(0.2VDC)
SupplyPermissible Voltage	24VDC±10% or 85～264VAC/DC (50/60Hz)
Power Consumption	24VDC：6.0W, 100-240VDC：6.0W, 100-240VAC：10VA
Insulation Resistance	100MΩ minimum at 500VDC between input-output-power-GND mutually
Withstand Voltage	2000VAC for one minute between input-output-power-GND mutually. (With VM-21H: 1,000VAC between output-GND)
Operating Temperature ／ Relative Humidity	0～50°C ／ 10～90%RH(no condensation)
Casing Material（color）	Modified polyphenylene oxide（black）
Weight	Approx. 110g（0.37lb）
CE Marking	Only as for 24VDC power supply specifications.

*2 Measurning 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.

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
	D		≥16	≥36	≥20	≥40
Set gap [recommended] (mm)		／	1.0～1.5	2.5～3.5	1.0～1.5	2.5～3.5

VM-21 SERIES

SPECIFICATIONS

VM-21P
3-WIRE LVDT SIGNAL CONDITIONER

CE

Model Code

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								

Standard

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.

SPECIFICATIONS

Input LVDT	LS 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°C, ±2% of F.S. at 0 to 50°C 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.
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 for LVDT Excitation	Voltage: 5Vrms, Frequency: 3kHz, Max. current: 50mA, Sine wave
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 3.5W, 100-240VDC: 3.5W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ 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°C (32 to 122°F 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).
- When there is an abnormality in LVDT excitation output (oscillation has stopped).

VM-21 SERIES

SPECIFICATIONS

VM-21D
6-WIRE LVDT SIGNAL CONDITIONER

CE

Model Code

VM-21D □ - □□ F □□□□ - □

Power supply		Measuring range		Input LVDT		Full range of input LVDT		Output		Conditioner socket	
1	24VDC	21	50mm	F	LF Series	100	100mm	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	23	100mm			250	250mm	2	4 to 20mADC	1	Include
		24	150mm			300	300mm				
		25	200mm			400	400mm				
		26	250mm								
		27	300mm								
		30	400mm								

Standard

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.

SPECIFICATIONS

Input LVDT	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	±1.5% of F.S. at 25°C, ±3% of F.S. at 0 to 50°C 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
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: 1kΩ
Output for LVDT Excitation	Voltage: 7Vrms, Frequency: 1kHz, Max. current : 35mA, Sine wave
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC: 6.0W, 100-240VDC: 6.0W, 100-240VAC: 10VA
Insulation Resistance	100 MΩ 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°C (32 to 122°F 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, there may be some instances where these conditions will not be detected.

• When there is an abnormality in LVDT excitation output (oscillation has stopped).

VM-21 SERIES

SPECIFICATIONS

VM-21F
TEMPERATURE SIGNAL CONDITIONER

CE

Model Code No.

VM-21F □ - □□□□ - □

Power supply		Measuring		Input transducer*1				Output		Conditioner socket	
1	24VDC	1	0～100℃	TK	Thermocouple Type K	R1	Pt100(ITS-90)	1	1 to 5VDC	0	Without
2	100 to 240VAC/DC	9	Others	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						

Standard

Note) *1 Not applicable for 4WIRE of RTD

SPECIFICATIONS

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. 0.5mA DC
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

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

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VM-21F
TEMPERATURE SIGNAL CONDITIONER

CE

SPECIFICATIONS	
I/O Conversion Accuracy	±0.1% of F.S. at 25°C 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, 100-240VDC：2.9W, 100-240VAC：6.7VA
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°C (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.

VM-21 SERIES

SPECIFICATIONS

VM-21E
PROCESS SIGNAL CONDITIONER

CE

Model Code No.

VM-21E □ - □□ - □

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

Standard

SPECIFICATIONS

Input Range	1～5VDC , 4～20mADC
Input Resistance	1～5VDC : 1MΩ 4～20mADC: 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 Resistance	Attaching externally (Installation for current input)
Supply Permissible Voltage	24VDC±10% or 85 to 264VAC/DC (50/60Hz)
Power Consumption	24VDC：2.4W, 100-240VDC：2.6W, 100-240VAC：7.1VA
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°C (32 to 122°F REF.)
Relative Humidity	10 to 90%RH(no condensation)
Casing Material（color）	Modified polyphenylene oxide（black）
Weight	Approx.116g（0.26lb）
CE Marking	Only as for 24VDC power supply specifications.

Note) *1 The output mode is not changeable on the field.

VM-21 SERIES

SPECIFICATIONS

VM-21G
SIGNAL CONDITIONER SOCKET

CE

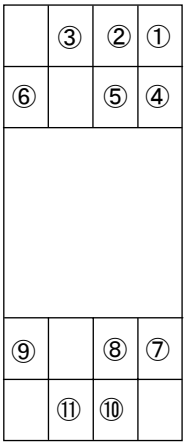
Model Code

VM-21G

SPECIFICATIONS

Terminal Screw Size	M3
Number of Mountable Signal Conditioners	1
Operating Temperature	0 to 50°C (32 to 122°F 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-21P	VM-21D
1	-24V				IN (A)	IN (F)
2	IN	IN	IN	IN	IN (B)	IN (D/E)
3	COM	COM	COM	COM	IN (C)	IN (C)
4				WAVE		IN (A)
5	COM	COM	COM	COM	TP (–)	IN (B) / TP (–)
6	BUF	BUF	BUF	BUF	TP (+)	TP (+)
7	OUT					
8	GND					
9	COM					
10	L +					
11	N –					

Terminal No.	VM-21T	VM-21R		VM-21E	VM-21F		
		FK input	MS input		Themrmocouple	RTD	mV Signal
1	-24V	-24V		IN(+)	IN	A	IN
2	IN	IN					
3	COM	COM		IN(-)	COM	B	COM
4		PULSE				B	
5	COM	COM					
6	BUF	BUF					
7	OUT						
8	GND						
9	COM						
10	L +						
11	N –						

VM-21H
BACKPLANE UNIT

CE

Model Code

VM-21H□

Power supply	
1	24VDC
2	100-240VAC/DC

SPECIFICATIONS

Terminal Screw Size	M3.5
Connector Specifications	MASTER: D-Sub25P (Socket) Housing lock screw: #4-40 Recommended connector for Plug side: DB-25PF-N (Japan Aviation Electronics Industry, Ltd.) SLAVE : D-Sub25P (Socket) Housing fix screw: #4-40 Recommended connector (Plug side): DB-25PF-N (Japan Aviation Electronics Industry, Ltd.) OUTPUT: Panel connector 56P (Socket) Recommended connector (Plug side): 00-8016-056 (Kyocera ELCO Corporation)
Number of Mountable Signal Conditioners	8 Max.
Redundant Power Supply	When selecting the power supply of 24V DC (VM-21H1), it is possible to make the power supply redundant by input a secondary 24V DC power supply. However, a redundant AC power supply, or a redundant power supply with input from an AC power supply and a DC power supply are not possible.
Operating Temperature	0 to 50°C (32 to 122°F REF.)
Relative Humidity	10 to 90%RH (no condensation)
Installation	Rack-mounted, wall-mounted
External Dimensions	W444.5×H130×D46.8 (mm)
Casing Material (color)	SPCC (black)
Weight	Approx.2.2kg (4.85lb)
CE Marking	Only as for 24VDC power supply specifications.

VM-21 SERIES

SPECIFICATIONS

VM-21H
BACKPLANE UNIT

CE

INPUT TERMINAL ARRANGEMENT

SLOT1			SLOT2			SLOT3			SLOT4		
③	②	①	③	②	①	③	②	①	③	②	①
⑥	⑤	④	⑥	⑤	④	⑥	⑤	④	⑥	⑤	④

SLOT5			SLOT6			SLOT7			SLOT8		
③	②	①	③	②	①	③	②	①	③	②	①
⑥	⑤	④	⑥	⑤	④	⑥	⑤	④	⑥	⑤	④

TERMINAL No.	VM-21K	VM-21U	VM-21B	VM-21A	VM-21P	VM-21D
1	-24V				IN (A)	IN (F)
2	IN	IN	IN	IN	IN (B)	IN (D/E)
3	COM	COM	COM	COM	IN (C)	IN (C)
4				WAVE		IN (A)
5	COM	COM	COM	COM	TP (–)	IN (B) /TP (–)
6	BUF	BUF	BUF	BUF	TP(+)	TP(+)

TERMINAL No.	VM-21T	VM-21R		VM-21E	VM-21F		
		FK input	MS input		Themrmocouple	RTD	mV Signal
1	-24V	-24V		IN(+)	IN	A	IN
2	IN	IN					
3	COM	COM		IN(-)	COM	B	COM
4		PULSE				B	
5	COM	COM					
6	BUF	BUF					

MASTER, SLAVE, OUTPUT PIN ASSIGNMENT

MASTER PIN ASSIGNMENT

Pin	Signal	Pin	Signal
1	OUT 1	9	OUT 5
2	COM 1	10	COM 5
3	OUT 2	11	OUT 6
4	COM 2	12	COM 6
5	OUT 3	13	OUT 7
6	COM 3	14	COM 7
7	OUT 4	15	OUT 8
8	COM 4	16	COM 8
		17 to 25	

SLAVE PIN ASSIGNMENT

Pin	OUTPUT connection (Signal)	Pin	OUTPUT connection (Signal)
1	LL (OUT 9)	9	f (OUT 13)
2	MM (COM 9)	10	c (COM 13)
3	CC (OUT 10)	11	Z (OUT 14)
4	HH (COM 10)	12	U (COM 14)
5	t (OUT 11)	13	P (OUT 15)
6	x (COM 11)	14	C (COM 15)
7	j (OUT 12)	15	N (OUT 16)
8	m (COM 12)	16	C (COM 16)
		17 to 25	

OUTPUT PIN ASSIGNMENT

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A		K		U	COM 14	c	COM 13	m	COM 12	w		EE	COM 2
B	COM 8	L	OUT 7	V		d		n		x	COM 11	FF	
C	COM 16	M	OUT 8	W	OUT 6	e	OUT 5	p	OUT 3	y		HH	COM 10
D		N	OUT 16	X		f	OUT 13	r		z	OUT 2	JJ	
E		P	OUT 15	Y		h	OUT 4	s		AA	OUT 1	KK	
F	COM 7	R		Z	OUT 14	j	OUT 12	t	OUT 11	BB	OUT 9	LL	COM 1
H		S	COM 6	a		k		u		CC	OUT 10	MM	COM 9
J	COM 15	T		b	COM 5	l	COM 4	v	COM 3	DD		NN	

POWER SUPPLY TERMINAL ARRANGEMENT

①	②	③	④	⑤

Terminal No.	24VDC	100-240VAC	100-240VDC
1	+		
2	–		
3	+	L	+
4	–	N	–
5	GND	GND	GND