

VGM5 Series Application Examples

The VGM5-3 series supports both process input and strain gauge input, adding another step toward broader measurement range.

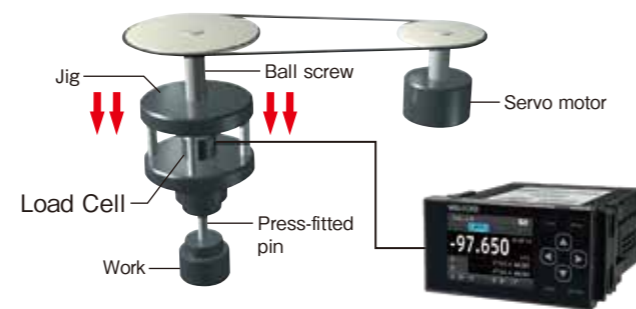
Differential pressure control for two-part adhesive dispensing system



Recommended pressure sensors
VPRF, VF, VFM, VESIM□□A

For Press fit machines

In case of motor-driven system



Recommended load cell
VLC-E344, VLC-H400, VLC-G811, VLC-G510A, VU93

For Hydraulic press machines



Recommended pressure sensors
VESV/VESI, VPVT(F)/VPVQ(F)

Hydraulic control for Coating machines or dispensers



Recommended pressure sensors
VPRF, VF, VFM, VESIM□□A



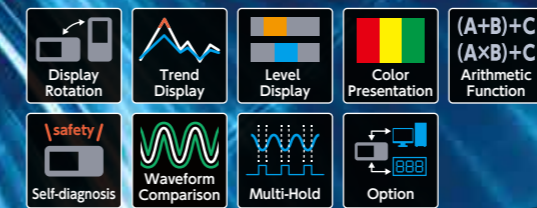
Multifunctionality and Various Display Modes to Step into a New Realm

Graphical Digital Panel Meter

VGM5 series

Process Input A/Bch	Strain gauge Input A/Bch Process Input A/Bch
VGM5-1	VGM5-3

Graphical presentation with bar and trend graphs, portrait and landscape modes of screen orientation, and intuitive status indication with 3 colors (R/Y/G). VGM5 series, full of these features required on site, creates a new realm of panel meters.



<https://www.valcom.co.jp/>

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Display Rotation Function

Orientation selectable to suit the on-site needs

Standard feature includes the rotation of the screen by 90 degrees. You can choose between landscape and portrait modes. For example, addition of digital panel meter that was unexpected at the system development stage, can become another option.



Landscape mode



Portrait mode



Selectable Input Modes and Highly Expressive Display, Stemmed from Pursuit of the Ideal Panel Meter.

Graphical Digital Panel Meter

Sampling rate Max. 4000times/sec ※2ch : Max. 2000times/sec

Process Input A/Bch

VGM5-1

Strain gauge Input A/Bch Process Input A/Bch

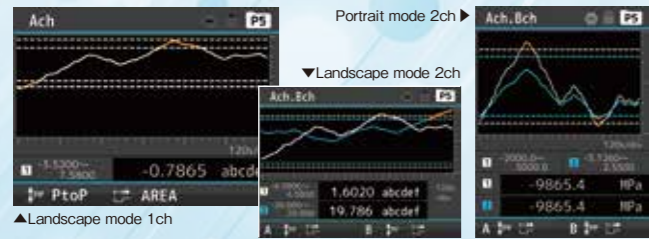
VGM5-3

Two models: VGM5-1 and VGM5-3 are available. The former enables 2-channel (A/B) process input, and the latter supports 2-channel (A/B) strain gauge and process inputs. VGM5-3 flexibly supports measurement system from load cell (strain gauge). Besides multiple input, the VGM5 series supports graphs, waveforms, and color presentation on a large and clear display that can be set in portrait and landscape orientations.



Trend (Line Graph) Display

This graph allows you to grasp the trend in measurement (for example, any problem in press-fit or variations in multiple press).



Level (Bar Graph) Display

Shows the percentage of the measured value in the whole, allowing it to be expressed relatively.



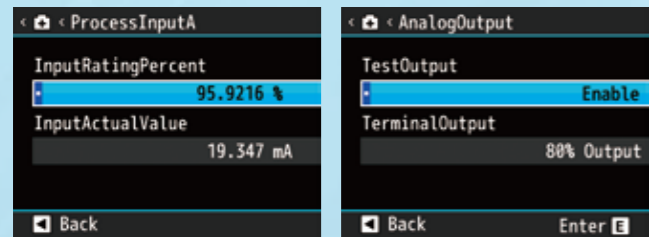
Easy-to-Identify Color Presentation

Background color that changes automatically when outputting alarms is selectable from red, yellow and green. Highly identifiable universal color design adopted.



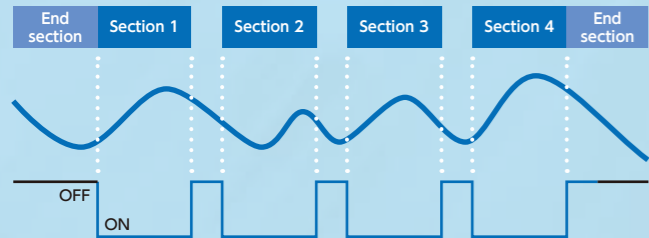
Self-diagnosis Function

This function is incorporated in order to prevent possible accidents with the connected equipment. It enables you to confirm safety before starting operation or inspection.



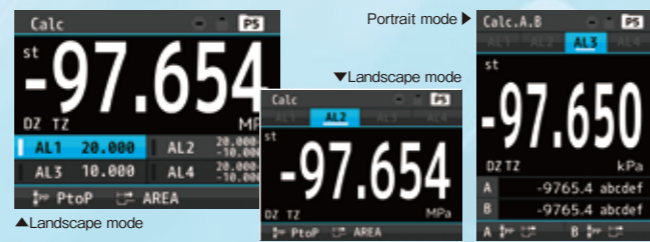
Multi-Hold Mode [VGM5-3 only]

Comparative output is made by comparing the hold value and the preset reference value for each section. This enables judgment section by section in caulking process, etc.



Arithmetic Function (2-channel Input)

Measured values for each channel simultaneously show 1~3 results of arithmetic operations that can be chosen from 10 formulas respectively.



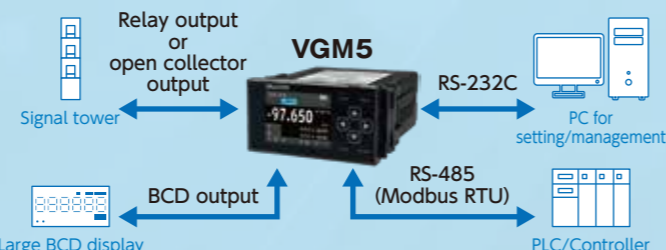
Waveform Comparison Function [VGM5-3 only]

Alarm output and waveform log are enabled by comparing measured waveform and reference waveform. (2-channel simultaneous comparison available)



Wealth of Optional Functions

Communication/output functions are available from RS-485 (Modbus RTU), RS-232C, analog output and BCD output.



BASIC SPECIFICATIONS

※For more information about the specifications, visit VALCOM website.

Number of input channel	1 or 2 (According to model codes)	Supply power	AC power [7] AC100 to 240V±10% 50/60Hz DC power [5] DC12V±10% DC power [8] DC24 to 48V±10%
Display	2.4 inch TFT liquid crystal display Used in 1ch input: A ch. measurement result Used in 2ch inputs: A ch. measurement result, B ch. measurement result, calculation result, A ch. and B ch. measurement results, A ch. or B ch. measurement result and calculation result	Power consumption	AC power [7] At AC100V:11VA max, At AC240V:15VA max DC power [5] At DC12V:6.5W max DC power [8] AtDC24V:6.5Wmax, At DC48V:7Wmax
External controls	5 functions can be assigned to control terminals (user-configurable).	Weight	Approx. 350g
Ambient temperature range	-5 to 50°C 35 to 85%RH (Non condensing)	Vibration tolerance	10 to 55Hz half amplitude 0.15mm in X, Y, Z directions for 30 minutes
Storage temperature range	-10 to 70°C up to 60%RH	Protective structure	IP66(front)
Withstand voltage	Between Power terminals and inputs/external controls/comparative outputs/other outputs AC power [7] AC3000V for 1 minute, DC power [5] or [8] AC1500V for 1 minute AC power and DC power Between input terminals and external controls/comparative outputs/other outputs AC1500V for 1 minute Between enclosures and each terminals AC3000V for 1 minute	Conformed EN standard	EN61326-1(EMS:industrial electromagnetic environment/EMI:Class A) (Applicable to line length only under 30m) EN61010-1, EN50581
Insulation resistance	Between terminals mentioned above, at DC500V 100MΩ or higher	Material of enclosure	polycarbonate(PC) black UL94V-0

Process/Strain gauge (VGM5-3 only) INPUT SPECIFICATIONS

Measurement range	Process : ±5V, 0~5V, 1~5V, ±10V, 0~10V, ±20mA, 0~20mA, 4~20mA Strain gauge : -3.5mV/V~3.5mV/V	Conversion method	ΔΣ conversion method
Input resistance	Approx. 1MΩ (±5V, 0~5V, 1~5V, ±10V, 0~10V), Approx. 100kΩ (±20mA, 0~20mA, 4~20mA)	Input signal	Single ended
Maximum allowable input	±100V (±5V, 0~5V, 1~5V, ±10V, 0~10V), ±50mA (±20mA, 0~20mA, 4~20mA)	Sampling rate	Max. 4000times/sec (1ch product) Max. 2000times/sec (2ch product)
Accuracy	±(0.05% of FS+1 digit) (23±5°C 35~85%RH)	Display updating period	10sps, 1sps
Adjustment range of gain	1mV/V~3.5mV/V	Zero display	Leading zero suppress
Calibration accuracy	±(0.1% of FS+1 digit) (23±5°C 35~85%RH)	Decimal point	Settable freely
Nonlinearity	±(0.02% of FS+1 digit) (23±5°C 35~85%RH)	Display resolution	1/99999
Applicable bridge resistance	350Ω	Display range	-99999~99999
Bridge voltage	DC5V±10% 60mA ※Four 350Ω load cells can be connected DC10V±10% 30mA, DC2.5V±10% 30mA	Sensor power supply	Process : DC12V±10% 100mA max. DC24V±10% 50mA max. ※When used with a combination of DC12V and DC24V, power consumption is 1.2W max.
Temperature characteristic	100ppm/°C	Strain gauge : 5V, 10V, 2.5V	

COMPARISON OUTPUT SPECIFICATIONS

Open collector output	Output rating NPN:Sink current 50mA max. PNP:Source current 50mA max. Applied voltage 30V max. Output saturation voltage ≤1.2V at 50mA Number of outputs 4 transistor outputs	Judgement value settable range	-99999~99999
Relay output	Contact rating:AC250V 2A, DC30V 2A Mechanical life:20 million times Electrical life:100 thousand times or more 4 A contacts, AL1 and AL2, AL3 and AL4 share common	Hysteresis	Settable within the range of 1-99999 digits for each judgement value independently
Control method	Microcomputer calculating method	Comparison action	According to sampling rate (circulate period)
		Setting condition	Condition of comparison can be set to AL1 to AL4 independently Level judgement mode, Zone judgement mode, Difference judgement mode
		Comparison formula memory	8 pattern memory

ANALOG OUTPUT SPECIFICATIONS

Conversion method	D/A conversion method	Output	0~10V, ±10V, 1~5V, 0~20mA, 4~20mA
Resolution capability	Equivalent of 13bit	Load resistance	≥2kΩ (0~10V, ±10V, 1~5V), ≤550Ω (0~20mA, 4~20mA)
Scaling	Digital scaling	Accuracy	±(0.1% of FS) (23±5°C 35~85%RH)
Output objective	An item can be selected from source displayable values	Ripple	±50mVp-p (0~10V, ±10V, 1~5V) ±25mVp-p (0~20mA, 4~20mA) ※Ripple is at load resistance 250Ω, 20mA output
Circuit response	Up to 300μs (0~90% response)		

BCD OUTPUT SPECIFICATIONS

Output type	Open collector output NPN/PNP type	Synchronized signal (PC)	Transistor is ON for a fixed period every time data becomes valid
Measurement data	Negative logic transistor is ON at logical "1"	Transistor output capability	Voltage 30V max. Current 10mA max. Output saturation voltage up to 1.2V at 10mA
Polarity signal	Negative logic transistor is ON at minus display	Enable	By shorting the enable terminal to -D.COM or bringing to same voltage level, the BCD output transistors become OFF.
Over signal	Negative logic transistor is ON at over display		

RS-232C/RS-485 SPECIFICATIONS

Communication protocol	RS-232C:Modbus-RTU,OriginalCommand,OriginalOutput RS-485:Modbus-RTU	Stop bit	RS-232C:1bit, 2bit RS-485:1bit
Synchronization method	Asynchronous	Delimiter	CR+LF, CR
Communication method	RS-232C:Full duplex RS-485:2-wire half-duplex	Character code	Code ASCII
Baud rate	9600bps, 19200bps, 38400bps	Transmission control procedure	No control sequence
Data length	RS-232C:8bit, 7bit RS-485:8bit	Used signal names	RS-232C:TXD, RXD, SG RS-485:Non-inverting (+), Inverting (-)
Start bit	1bit	Number of connectable units	RS-232C:1 RS-485:31
Parity bit	None, Odd, Even	Cable length	RS-232C:Max. 15m RS-485:Max.1.2km (total) *Conforming CE mark, less than 30m

Model Selection



Selection	Check	Model	Specifications	Selection	Check	Model	Specifications
① Model		VGM5-1	DC Voltage / DC Current measurement	⑤ Output		D	Display only (No output)
		VGM5-3	Strain gauge meter / DC Voltage / DC Current measurement			A	Analog output
② Supply power		7	Supply power : AC100 to 240V			B4	BCD output (open collector NPN)
		5	Supply power : DC12V			B5	BCD output (open collector PNP)
		8	Supply power : DC24 to 48V		RS	RS-232C	
③ Input A ch.		N	Process input		R2	RS-485 (Modbus RTU)	
		GV	Strain gauge input ※VGM5-3 only	⑥ Comparative output		ON	Open collector NPN
		X	No B ch. input			OP	Open collector PNP
④ Input B ch.		N	Process input			SA	Relay output (Normally open)
		GV	Strain gauge input ※VGM5-3 only		X	Without test report	
				⑦ Test report		T	With test report
				⑧ Additional code		00	Standard (Initial language: Japanese)
						E0	Initial language setting: English

External dimensions [Unit:mm]

