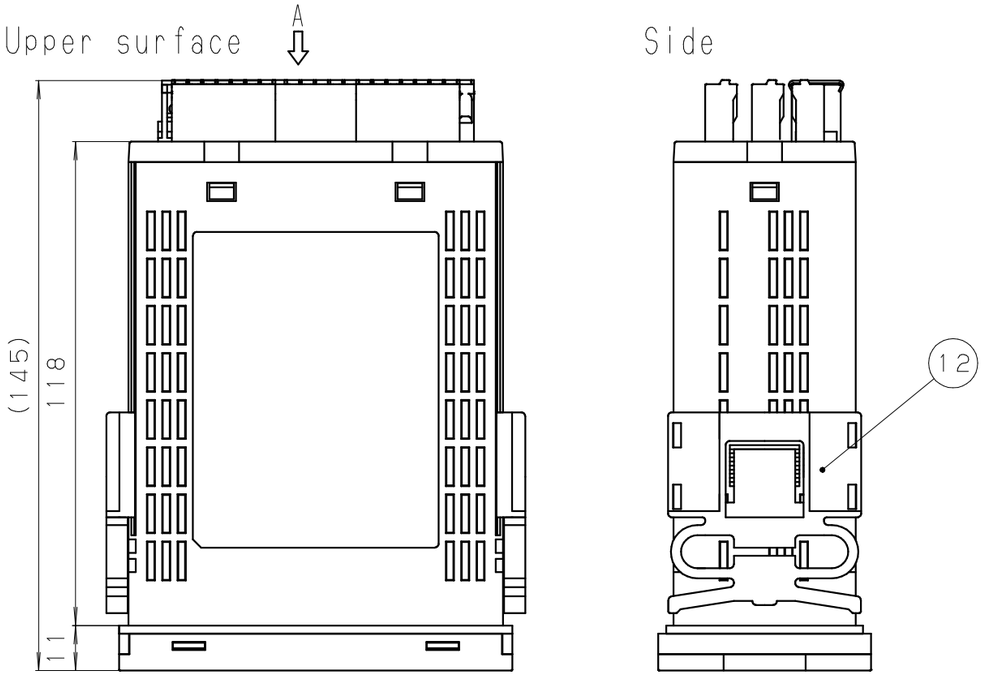
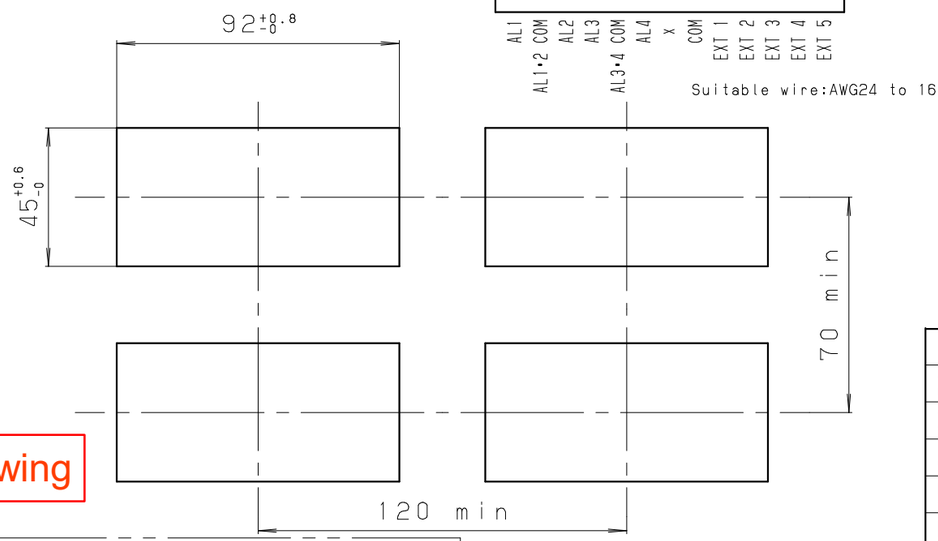
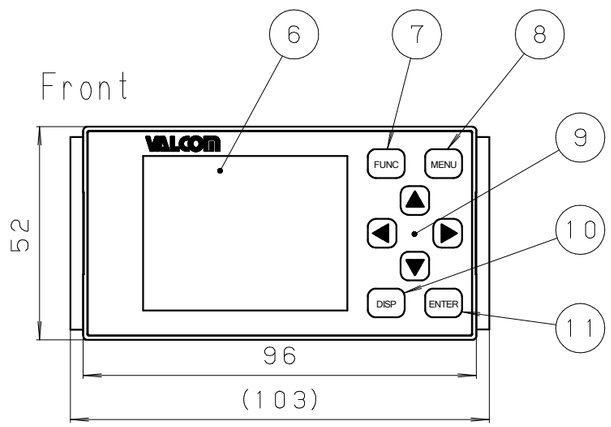
■External dimensions (1:1.5)



■Panel cut dimensions (1:2)





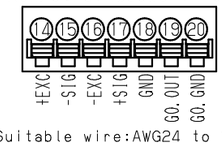
Reference drawing

■Connecting Terminals (Free)

♦Input/GO output

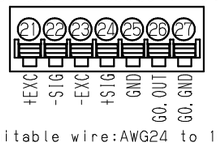
※Screwless connector

Ach. Straingauge input



Suitable wire:AWG24 to 16

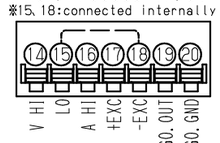
Bch. Straingauge input



Suitable wire:AWG24 to 16

Ach. Process input

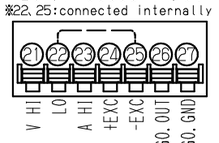
※15, 18:connected internally



Suitable wire:AWG24 to 16

Bch. Process input

※22, 25:connected internally

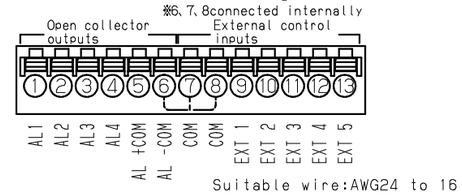


Suitable wire:AWG24 to 16

♦Comparative Output/External Control Input

【Open-collector output products】※Screwless connector

※6, 7, 8connected internally



Suitable wire:AWG24 to 16

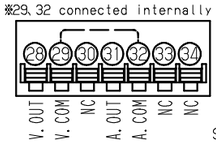
【Relay output products】※Screwless connector

Suitable wire:AWG24 to 16

♦Output terminal

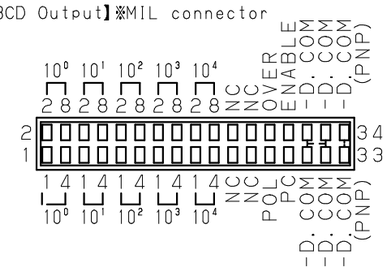
【Analog Output】※Screwless connector

※29, 32 connected internally

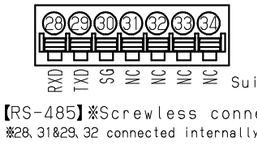


Suitable wire:AWG24 to 16

【BCD Output】※MIL connector



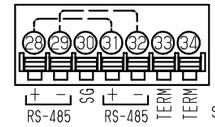
【RS-232C】※Screwless connector



Suitable wire:AWG24 to 16

【RS-485】※Screwless connector

※28, 31&29, 32 connected internally

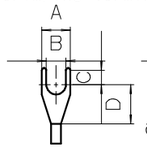


Suitable wire:AWG24 to 16

♦Supply Power

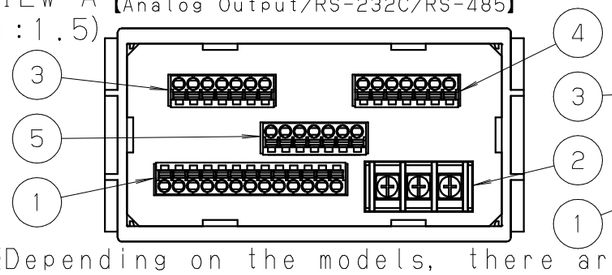
No.	Name	Description
P1	POWER(+)	Power source terminal (In case of DC power, +V)
P2	POWER(-)	Power source terminal (In case of DC Power, 0V)
P3	FG(NC)	FG terminal (DC Power option:no connection) (Non-usable for a relay terminal)

【Suitable crimping terminal】

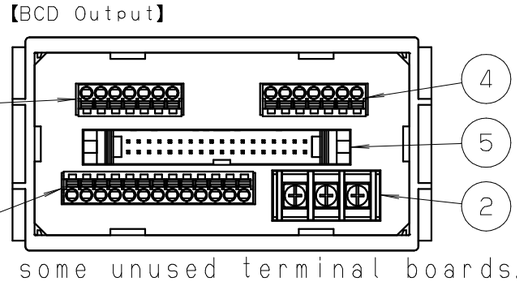


A	5~5.8mm	E	5~5.8mm
B	3~5mm	F	2~5mm
C	2~5mm	G	4.5~6mm
D	4.5~6mm	ØR	3~4.5mm

VIEW A (1:1.5) 【Analog Output/RS-232C/RS-485】



【BCD Output】



※Depending on the models, there are some unused terminal boards.

No.	Name	No.	Name
1	Comparetive output/External control input	7	FUNC key
2	Power	8	MENU key
3	A ch. inputs	9	Arrow keys
4	B ch. inputs	10	DISP key
5	outputs	11	ENTER key
6	Display	12	Adapter for mounting

符号 REV.	改訂日 REV. DATE	改訂内容 REVISION	担当 ENG	検図 CHK	承認 APP

材質 MATERIAL

表面処理 FINISH

第三角法 THIRD ANGLE PROJECTION

単位 UNIT mm

尺度 SCALE (1:2 Free) 1:1.5

シートサイズ SHEET SIZE A3

作成日 DATE 2021.1.7

製図 DRAWN	設計 DESIGNER	検図 CHECKED	承認 APPROVED
H. K.		T. T.	Kokita

顧客名 CUSTOMER

-

品名 TITLE

Digital panel meter

型式 MODEL

VGM5-3-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)

図面番号 DWG NO. AK-17-5002-01-00

改訂符号 REV

VALCOM 株式会社バルコム VALCOM CO., LTD

■MODEL CODES

VGM5-3-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)

- (VII) Additional code: 00:Standard (Initial language:Japanese) / E0:Initial language setting, English
- (VI) Test report: X:No test report / T:With test report
- (V) Comperative output: ON:Opencollector output (NPN) / OP:Opencollector output (PNP) / SA:Relay output (Normally open)
- (IV) Output: D:Display only (No output) / A:Analog output / B4:BCD output (Opencollector NPN) / B5:BCD output (Opencollector PNP) / RS:RS-232C / R2:RS-485 (Modbus RTU)
- (III) Input Bch.: X:No B ch. input / GV:Straingauge input / N:Process input
- (II) Input Ach.: GV:Straingauge input / N:Process input
- (I) Power: 7:Voltage power:AC100 to 240V / 5:Voltage power:DC12V / 8:Voltage power:DC24 to 48V

■BASIC SPECIFICATIONS

Number of input channel : 1 or 2 (According to model codes)

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

Over warning : By exceeding the range of display, displays OVER or -OVER

External controls : 5 functions of the followings can be assigned to control terminals (user-configurable).
①Comparative output reset function
②Hold reset function A/B/A&B
③Display value holding function A/B/A&B
④Maximum value holding function A/B/A&B
⑤Minimum value holding function A/B/A&B
⑥Amplitude value holding function A/B/A&B
⑦Deviation value holding function A/B/A&B
⑧Average value holding function A/B/A&B
⑨Digital zero function A/B/A&B
⑩Monitor change function
⑪Trend rog function
⑫Pattern select function 1/2/3
⑬Wave compare function A/B
⑭Multi hold function A/B
As follows, only short cut setting
⑮ManuAdjust function A/B
⑯AutoAdjust function A/B
⑰CompareList function

Ambient temperature range : -5 to 50℃ 35 to 85%RH (Non condensing)

Storage temperature range : -10 to 70°C up to 60%RH

Supply power : AC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
AC100 to 240V±10% 50/60Hz
DC power【VGM5-3-5-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
DC12V±10%
DC power【VGM5-3-8-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
DC24 to 48V±10%

Power consumption : AC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
At AC100V:11VA max At AC240V:15VA max
DC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
At DC12V:6.5W max
DC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
At DC24V:6.5W max, At DC48V:7W max

External dimensions : 96mm (W) x52mm (H) x145mm (D)

Weight : Approx. 350g

Withstand voltage : AC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
Between Power terminals and inputs/external controls/comparative outputs/other outputs AC3000V for 1 minute
DC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
Between Power terminals and inputs/external controls/comparative outputs/other outputs AC1500V for 1 minute
DC power【VGM5-3-7-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)】
Between input terminals and external controls/comparative outputs/other outputs AC1500V for 1 minute
Between enclosures and each terminals AC3000V for 1 minute

Insulation resistance : Between terminals mentioned above, at DC500V 100MΩ or higher

Vibration tolerance : 10 to 55Hz half amplitude 0.15mm in X, Y, Z directions for 30 minutes

Protective structure : IP66 (front)

Installation environment : indoor use

Rated altitude : up to 2000m

Transient overvoltage : Ⅱ

Measurement category : Ⅱ

Pollution degree : 2

Conformed EN standard : EN61326-1 (EMS:industrial electromagnetic environment/EMI:Class A)
(Applicable to line length only under 30m)
EN61010-1, EN50581

Material of enclosure : polycarbonate (PC) black UL94V-0

■INPUT SPECIFICATIONS

◎Straingauge input (Common to A ch. and B ch.)

Bridge power supply	Adjustment range of gain	Measurement range	Calibration accuracy (at 23±5°C 35~85%RH)	Nonlinearity (at 23±5°C 35~85%RH)
5V	1mV/V~ 3.5mV/V	-3.5mV/V~ 3.5mV/V	±(0.1% of FS±1digit)	±(0.02% of FS±1digit)
10V				
2.5V				

Conversion method : ΔΣconversion method

Applicable bridge resistance : 350Ω

Bridge voltage : DC5V±10% 60mA
※Four 350 Ω load cells can be connected
DC10V±10% 30mA
DC2.5V±10% 30mA
※When used in combination with process input, please use up to 1.2 W in combination with the power consumption of the sensor power supply.

Temperature characteristic : 100ppm/℃

Input signal : Single ended

Sampling rate : Max. 4000 times/sec (1ch product)
Max. 2000 times/sec (2ch product)

Display updating period : 10 sps/ 1 sps

Zero display : Reading zero suppress

Decimal point : Settable freely

Display resolution : 1/99999

Display range : -99999~99999

◎Process input (Common to A ch., B ch.)

Measurement range	Input resistance	Maximum allowable input	Accuracy (23±5℃ 35~85%RH)
±5V	Approx.1MΩ	±100V	±(0.05% of FS±1digit)
0~5V			
1~5V			
±10V			
0~10V			
±20mA	Approx.10Ω	±50mA	
0~20mA			
4~20mA			

※It is possible to measure up to ± 10% FS range on each range. (Limited with ± 10% FS by internal processing.)
In the bipolar input setting, the full scale is set to be ± separately, and for ± 10 V input, for example, limit processing is performed up to ± 11 V. (20 V is not treated as FS.)
Also in the accuracy of ± 10 V input, it is prescribed as one side FS handling and accuracy is calculated as 5 mV (0.05%) ± 1 digit.

Conversion method : ΔΣconversion method

Input signal : Single ended

Sampling rate : Max. 4000 times/sec (1ch product)
Max. 2000 times/sec (2ch product)

Display updating period : 10 sps/ 1 sps

Zero display : Reading zero suppress

Decimal point : Settable freely

Display resolution : 1/99999

Display range : -99999~99999

Sensor Power : DC12V±10% 100mA max. DC24V±10% 50mA max.
※Allowable current of 2 ch input is the above current together with A ch. and B ch.
※When used with a combination of DC12V and DC24V, power consumption is 1.2W max.
※When used in combination with strain gauge input, power consumption is 1.2W max in total.

■OUTPUT SPECIFICATIONS

【Comparison output】

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

Relay output : Contact rating:AC250V 2A, DC30V 2A
Mechanical life:20 million times
Electrical life:100 thousand times or more
4A contacts, AL1 and AL2, AL3 and AL4 share common

Control method : Microcomputer calculating method

Judgement value settable range : -99999 ~ 99999

Hysteresis : Settable within the range of 0-99999 digits for each judgement value independently.

Comparison action : According to sampling rate (circulate period).

Comparison formula memory : 8 pattern memory

【Analog output】

Conversion method : D/A conversion method

Resolution capability : Equivalent of 13bit

Scaling : Digital scaling

Output objective : An item can be selected from source displayable values

Response speed : Up to 300us (0→90% response)

Specifications for each output : Refer to the following chart.

Output type	Load resistance	Accuracy	Ripple
0 to 10V	≧2kΩ	±(0.1% of FS)	±50mVp-p
±10V			
1 to 5V			
0 to 20mA	≦550Ω		±25mVp-p
4 to 20mA			

*Current output ripple is at load resistance 250Ω, 20mA output.

【BCD output】

Output type : Open collector output NPN/PNP type

Measurement data : Negative logic transistor is ON at logical "1"

Polarity signal : Negative logic transistor is ON at minus display

Over signal : Negative logic transistor is ON at over display

Synchronized signal (PC) : Transistor is ON for a fixed period every time data becomes valid

Transistor capability : Voltage 30V max. Current 10mA max. Output saturation voltage up to 1.2V at 10mA

Enable : By shorting the enable terminal to -D. COM or bringing to same voltage level, the output transistors become OFF.

【RS-232C】

Communication protocol : Modbus-RTU/OriginalCommand/OriginalOutput

Synchronization method : Asynchronous

Communication method : Full duplex

Baud rate : 9600bps, 19200bps, 38400bps

Data length : 7bit, 8bit

Start bit : 1bit

Parity bit : None, Odd, Even

Stop bit : 1bit, 2bit

Delimiter : CR+LF, CR

Character code : ASCII

Transmission control procedure : No control sequence

Used signal names : TXD, RXD, SG

Number of connectable units : 1

Cable length : Max.15m

【RS-485】

Communication protocol : Modbus-RTU

Synchronization method : Asynchronous

Communication method : 2-wire half-duplex

Baud rate : 9600bps, 19200bps, 38400bps

Data length : 8bit

Start bit : 1bit

Parity bit : None, Odd, Even

Stop bit : 1bit

Used signal names : Non-inverting (+), Inverting (-)

Number of connectable units : 31

Cable length : Max.1.2km (total)
※Conforming CE mark, less than 30m

Reference drawing

符号 REV.	改訂日 REV. DATE	改訂内容 REVISION	担当 ENG	検図 CHK	承認 APP

材質 MATERIAL

表面処理 FINISH

第三角法 THIRD ANGLE PROJECTION

単位 UNIT mm

尺度 SCALE SIZE

シートサイズ SHEET SIZE A3

作成日 DATE 2021.1.7

製図 DRAWN	設計 DESIGNER	検図 CHECKED	承認 APPROVED
H. K.		T. T.	Kokita

顧客名 CUSTOMER
—

品名 TITLE
Digital panel meter (Specifications)

型式 MODEL
VGM5-3-(I)-(II)-(III)-(IV)-(V)-(VI) (VII)

図面番号 DWG NO.
AK-00-5014-01-00

改訂符号 REV

VALCOM 株式会社バルコム VALCOM CO., LTD