

# ANP-5D -6D

Comparator (for Analog output sensors)



- Capable of high-accuracy analog control

- High-speed sampling

With one-line input, input signals are captured at a sampling frequency of 2,000/sec as close to real time as possible (frequency at 1,000/sec each for two-line input).

- Averaging

Averaging feature is selectable between six cycle settings: 1, 10, 30, 50, 100 and 200. One-cycle averaging allows judgment in 0.5 ms, which outputs a signal in response to an instantaneous variation. 200-cycle averaging is suitable for slow and smooth control.

- Analog delay

The amplifier frequency characteristic is selectable between high speed (about 1 MHz) and low speed (about 1 kHz).

- Operation

For two-line input, addition/subtraction selection is available between “Ch 1 + Ch 2” and “Ch 1 – Ch 2.”

## ■ Type

Type	Model	Power supply	Input	Output
Digital comparator	ANP-5D	24V DC	Analog input	3
	ANP-6D			4

## ■ Typical Applications

- Thickness matching

Two sets of sensors used for “Ch 1 + Ch 2” operation for matching.

- Height difference matching

Two sets of sensors used for “Ch 1 – Ch 2” operation for matching.

- Position matching

Two sets of sensors used for “Ch 1 – Ch 2” operation for matching.

## Rating/Performance/Specification

Model		ANP-5D	ANP-6D	
Rating/performance/specification	Power supply	24V DC $\pm$ 10% max.		
	Current consumption	150mA max.		
	A/D conversion	Successive approximation; 12-bit (4096 division)		
	Measuring range	0-5/0-10 VDC (selectable with switch)		
	Resolution	Analog input with 5 V setting: 1.221 mV (calculated value) Analog input with 10 V setting: 2.442 mV (calculated value)		
	Analog input	1-line input for Ch 1/2-line input; addition or subtraction available		
	Display	Display format	5-digit: 20.000 V (max.)- -10,000 V (min.)	
		Display size	7-segment red LED; character size: 8 x 4 mm	
		Display frequency	20 times/s	
	Sampling frequency	1-line input: 2,000/s; 2-line input: 1,000/s		
	Averaging	1/10/30/50/100/200 times (selectable)		
	Output mode	No. of outputs	3 (L/M/S)	4 (HH/HI/LO/LL)
		Rating	NPN open collector output / Rating: sink current 100 mA (30 VDC) max.	
		Indicator	3 indicators (L: Red / M: Orange / S: Yellow)	4 indicators (HH: Red / HI: Orange / LO: Yellow / LL: Green)
	Gating input	Activation level	Closed or 1.0 VDC or lower	
		Deactivation level	Open or 2.8 VDC or higher	
		Response time	Activation: 35 ms max.; deactivation: 70 ms max.	
		Indicator	Green (front panel)	
	Reference setting	2 5-digit settings: ① P/L (large), ② P/S (small)	4 5-digit settings: ① HH ② HI ③ LO ④ LL	
	Analog delay	Amplifier frequency characteristic: H: high frequency/L: low frequency (selectable with switch)		
Case material	Resin			
Connection	Terminal block/DIN panel mounting			
Mass	350g max.			

## Environmental Specification

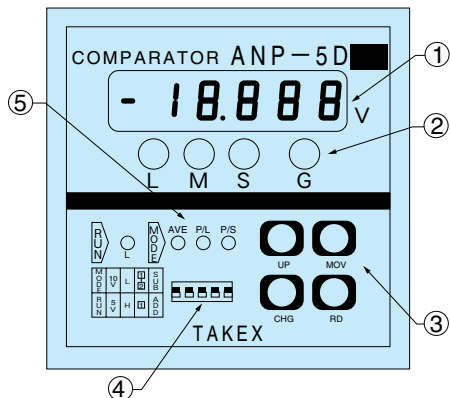
Environment	Ambient temperature	0 - +55 °C (non-freezing)
	Ambient humidity	35-85%RH (non-condensing)
	Protective structure	IP40
	Vibration	10-55 Hz / 1.5 mm amplitude / 2 hours each in 3 directions
	Shock	1000m/s <sup>2</sup> 2 times each in 3 directions
	Dielectric withstanding	1500 VAC for 1 minute
	Insulation resistance	500 VDC, 20 M $\Omega$ or higher.

## Applicable Sensor

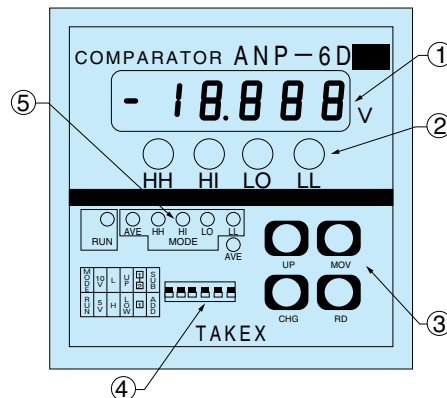
Sensor type	Model
Fiber optic sensor	F71RAN
Ultrasonic sensor	US-1AH, US-S25AN, US-S300 series USA-S1AN, USA-S3AN

## Panel Layout and Functions

Model ANP-5D



Model ANP-6D



### Functions

- ① **Input/data value display**  
5-digit value display. For negative values, “-” symbol precedes the value.  
The display indication depends on the setting of 4. function selector switch MODE/RUN.
- (1) **RUN setting**  
Input displayed in mV according to the function selector switch setting.
- (2) **MODE setting**  
Set data displayed according to the mode selection between AVE, P/L and P/S.
- ② **Operation indicator**  
Indicators for L (large: red), M (medium: orange), S (small: yellow) and G (gate: green) of the matching output.
- ③ **Pushbutton switches for setting data**  
Switches for setting data including data value selection, data read, digit switching, etc. Four switches are provided: **[UP]**, **[MOV]**, **[CHG]** and **[RD]**.
- ④ **Function selector switches**  
Settings of the following five functions can be configured. The table on the left of the switches shows the functions.
  - (1) **MODE/RUN**  
Select MODE for setting data. Select RUN for matching operation.
  - (2) **10 V/5 V**  
Set at 10 V for input of up to 10 V and at 5 V for input of up to 5 V.
  - (3) **L/H**  
The amplifier frequency characteristic is selectable between L (about 1 kHz) and H (about 1 MHz).
  - (4) **[1] · [2] / [1]**  
Selects between the numbers of input lines. Select “1\*2” for 2-line input for addition/subtraction matching and “1” for 1-line input (only Ch 1 is valid).
  - (5) **SUB/ADD**  
Enabled only for 2-line input. Select between subtraction (SUB) and addition (ADD).  
SUB setting performs “Ch 1 – Ch 2” operation.  
ADD setting performs “Ch 1 + Ch 2” operation.
- ⑤ **RUN/MODE indicators**  
RUN indicator (red)  
AVE, P/L, P/S (green)

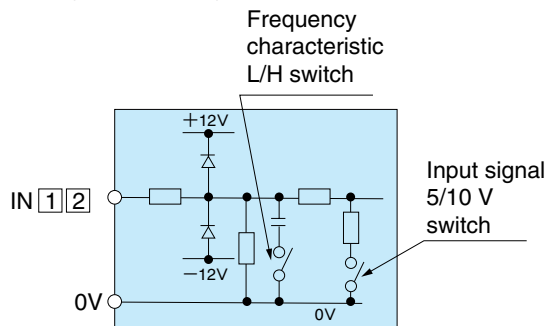
### Functions

- ① **Input/data value display**  
5-digit value display. For negative values, “-” symbol precedes the value.  
The display indication depends on the setting of 4. function selector switch MODE/RUN.
- (1) **RUN setting**  
Input displayed in mV according to the function selector switch setting.
- (2) **MODE setting**  
Set data displayed according to the mode selection between AVE, HH, HI, LO and LL.
- ② **Operation indicator**  
Indicators for HH (red), HI (orange), LO (yellow) and LL (green) of the matching output.
- ③ **Pushbutton switches for setting data**  
Switches for setting data including data value selection, data read, digit switching, etc. Four switches are provided: **[UP]**, **[MOV]**, **[CHG]** and **[RD]**.
- ④ **Function selector switches**  
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Select MODE for setting data. Select RUN for matching operation.
  - (2) **10 V/5 V**  
Set at 10 V for input of up to 10 V and at 5 V for input of up to 5 V.
  - (3) **L/H**  
The amplifier frequency characteristic is selectable between L (about 1 kHz) and H (about 1 MHz).
  - (4) **UP/LOW**  
Selects between output logics. Select UP for activation for a value larger than the setting and LOW for activation for a value smaller than the setting (see Figure 12).
  - (5) **[1] · [2] / [1]**  
Selects between the numbers of input lines. Select “1\*2” for 2-line input for addition/subtraction matching and “1” for 1-line input (only Ch 1 is valid).
  - (6) **SUB/ADD**  
Enabled only for 2-line input. Select between subtraction (SUB) and addition (ADD).  
SUB setting performs “Ch 1 – Ch 2” operation.  
ADD setting performs “Ch 1 + Ch 2” operation.
- ⑤ **RUN/MODE indicators**  
RUN indicator (red)  
AVE, HH, HI, LO, LL indicator (green)

## Input Circuit (Common)

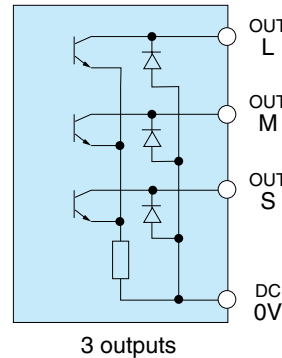
Input signal selection

- Input signal switch (5/10)
  - 5: up to 5 V; 10: up to 10 V
- Signal waveform analog delay switch (L/H)
  - L: low frequency (about 1 kHz); H: high frequency (about 1 MHz)

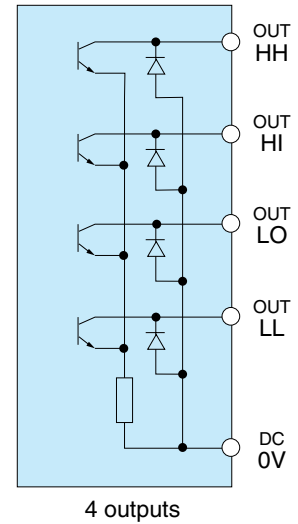


## Output Circuit

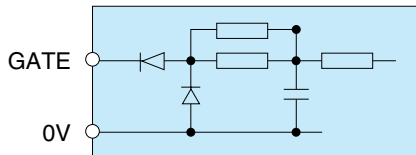
Model: ANP-5D



Model: ANP-6D



## External Gating



- Switch: activated with open  
Open collector: ON at 2.8 VDC or higher, OFF at 1 VDC or lower
- Output  
NPN open collector  
Rating: 100 mA (30 VDC) max.
- All output transistors turn off when load short circuit or overload occurs.  
Check the load and turn the power back on.

## Dimensions (in mm)

Model: ANP-5D

Model: ANP-6D

CAD

