pantos®

UNICORDER
U－329 (500)

SPECIFICATION

Specifications are subject to change without notice.

	Drawing Number	Amendment
PANTOS CO., LTD	325D01－00－0001	H

Product number	Drawing name
U-329	UNICORDER U-329 (500) SPECIFICATIONS

1. OUTLINE

PANTOS Model U-329 Desk-top Automatic zero balancing DC-servo Recorder is a device to continuously record waveform corresponding to input signal on chart paper which moves at a constant speed by pens which are automatically balanced by means of servo system; a method known as a self-balancing method or so called zero method.

Based on years of our experience, U-329 recorder was developed giving emphasis on substantial specifications and improved performance and versatility in operation in addition to consideration on style as well as compactness and light weight. As a result, this recorder has many outstanding features, as described in the following.

2. FEATURES

(1) Use that inclines from a desk-top type on a record horizontal side, and 12° changes the angle into a wall hanging type to which the record side is vertical is possible.
The limited space can be effectively used.

(2) In addition of being compact and light weight, it is designed as being easily carried by one hand from one place to other wherever necessary.

(3) Having an extended writing panel, the state of recording can be easily observed.

(4) Having no obstacles on the right side of the writing panel, entry of data into the chart paper is easy.

(5) The pulse motor is adopted for the record paper feed.
Abundant sending speeds at 23 velocities every 24 steps can be freely selected.
Driving stop from the outside is also possible. can do the record paper feed proportional to the frequency in the external signal source

(6) Equipped with a fast forward switch that makes the position correction of the chart paper easy.

(7) Rewind switch allows the chart paper to be easily retracted to a desired position.

(8) Because the chart take-up device is designed so as to be optionally built into the recorder without having to externally attaching it, only a minimum space is required for the operation (optional).

(9) Equipped with a chart paper end alarm, the end of the chart paper is notified by a buzz and a flashing lamp.

(10) Using cartridge type fiber tip pens, such trouble as sudden "out of ink" cannot happen during the recording. The maintenance is easy, too.

(11) Adoption of 1kHz modulation type servo amplifier and direct current servo method.
It has an excellent response, the noise characteristic, and the temperature characteristic.

(12) The polarity of signal input can be changed by a switch.

(13) Equip a proofreading power supply.
A check of fullspan voltage accuracy and proofreading can be performed easily.

(14) Having a superimposed event marker as a standard feature, entries of marks can be made on any part of the chart. This feature is also helpful in knowing the recorded time lag between the pens.

(15) Adoption of film potentiometer, and it equips it with the shake slice protection circuit.
Reliability has improved further.

Product number	Drawing name
U-329	UNICORDER U-329 (500) SPECIFICATIONS

Item	Specifications		
Model	U-329		
Number of channels ※1	3		
Measuring System	Automatic Zero Balancing DC-servo		
Writing width	250mm		
Pen speed	More than 750mm/sec		
Zero point	Right Zero of the chart paper		
Zero set range	＋100% from right zero center		
Zero point check switch	Provided		
Measuring range	1, 2, 5, 10, 20, 50, 100, 200, 500 mV 1, 2, 5, 10, 20, 50, 100, 200 V (17 ranges)		
Fine adjust for Measuring range ※2 (Range Vernier)	Option		
Polarity switch	Provided		
Input method	Floating		
Input impedance	1MΩ (constant)		
Tolerable signal source resistance	Less than 10kΩ		
Accuracy ※3	±0.3% (23℃) Temperature Coefficient ±0.025%／℃ MAX.		
Errors between ranges	2mV to 50mV ranges ±0.15% (23℃) Temperature Coefficient ±0.005%／℃ MAX. 0.1V to 200V ranges ±0.2% (23℃) Temperature Coefficient ±0.0075%／℃ MAX.		
Dead band	±0.1%		
Linearity	±0.25%		
Noise rejection ※4	CMRR	DC	Over 160dB
		AC (50／60Hz)	Over 160dB
	NMRR	AC (50／60Hz)	Over 64dB

Drawing Number	Page	Amendment
325D01－00－0011	2／6	H

Product number	Drawing name
U-329	UNICORDER U-329 (500) SPECIFICATIONS

Item	Specifications	
Temperature characteristics ※5	Zero drift upon introduction of power	Less than ± 0.5 % (at constant room temperature)
	Zero drift upon stabilization	Less than ± 0.15 %／10℃
Chart speed ※6	(1) 10, 15, 20, 30, 40, 60, mm/h, cm/h, mm/min, cm/min 24 steps and 23 sppeds (10 mm/min and 60 cm/h are overlapping)	
※7	(2) Chart drive by External signal ・Chart speed : 1mm／min Max 600Hz ・Input impedance : Morr than 4.7 kΩ ・External power Voltage : High level +2V to +20V Low level +0.8V to −20V (operable at TTL level) Signal waveform : Pulse, sine wave, square wave, triangular wave, etc. (Pulse width ; Over 50 μsec)	
Chart fast forward switch	Provided	
Chart end alarm	Following actions take place when chart paper comes to an end ; ・Buzzer is sounded ・Lamp is flashed ・Chart drive is stopped ・Pen is stoppedd	
Chart rewind device	Provided	
Record paper feed drum	~~Models : 00~~	Models : 500
	~~No Sproket~~	With Sproket
Chart paper	№ 25162P50 , 20m long , reight zero	
Recording pen	Catridge type fiber tip pen	
Ink colors	Channel 1 − red, Channel 2 − green, channel 3 − brown	
Pen lift	Individually and manually operated (Distance between pens : 4mm)	
Torque reduction circuit ※8	Provided	
Evevt maker	Superimposing Amplitude : +3.5 ± 1 graduation Time : 0.2 to 0.4 sec	
Evevt maker switch ※9	Provided	
Calibration voltage	Voltage Highest sensitivity range value (1V MAX.) Accuracy ±0.2 % (23 ℃) Temperature coefficient ±0.007 %／℃ MAX	

Product number	Drawing name
U-329	UNICORDER U-329 (500) SPECIFICATIONS

Item	Specifications		
Environment	Temperature 0 to 45℃ Humidity 45 to 85%		
Power	Voltage range	AC 100V ±10% Common for 50Hz, 60Hz	
	Power Consumption (TYP.)	When balanced	23VA
		MAX	62VA
Insulation resistance	Power − Chassis (GND) : Over 50MΩ (DC500V megger)		
	Input terminal − Chassis (GND) : Over 100MΩ (DC500V megger)		
Dielectric strength	Power − Chassis (GND) : AC1000V for 1 minute		
	Input terminal − Chassis (GND) : AC1000V for 1 minute		
External dimensions	430(W)×170(H)×410(D)mm (The size of the projecting is not included.) Externalview (Drawing number 325D01−00−0011Δ)		
Weight	Approx. 11kg		
Accessories	Chart paper № 2516P50 1 Recording pen For channels 1 (Red) NDF−R For channels 2 (Green) NDF−G 1 each For channels 3 (Brown) NDF−BN Fuse 1A 1 Recording form holder Right and left each 1 Dust cover 1 Power cord adaptor 1 Insutruction manual 1		

※ 1 It sees from front of recorder as a channel 3, the channel 2, and the channel 1.

※ 2 Each of the measuring ranges can be expanded up to 2.5 times. (Option)

※ 3 Accuracy including straight line when polarity switch is set to "+", and it measures it with the highest sensitivity range.

※ 4 The value in the measurement with the highest sensitivity range is indicated.

※ 5 The value in the measurement with the highest sensitivity range is indicated.
The energizing time until stabilizing is about 30 minutes.

※ 6 Chart drive may be remotely operated in this case, an external control terminal "CHART DRIVE" is used. (Cautions 1)
Moreover, it can operate also by making it a closed circuit with a point of contact, an anlog switch, and an open collector transistor.

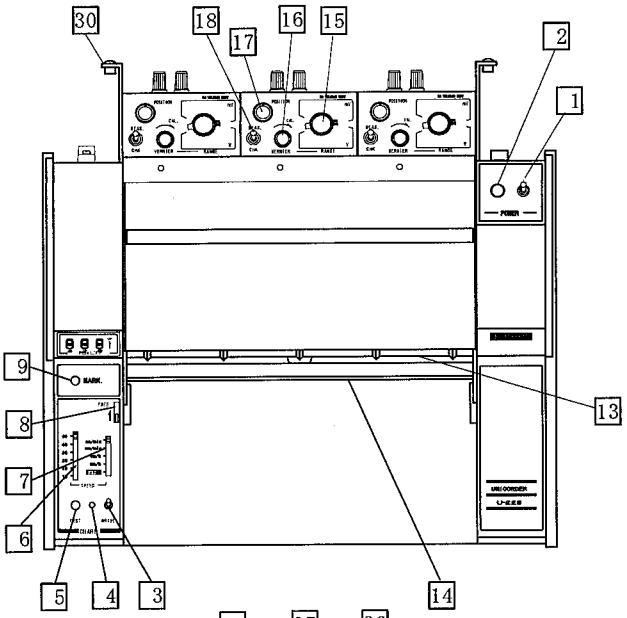
※ 7 An external signal is applied to external control terminal "CHART OSC" upon setting chart speed unit selection switch on the panel to "EXT" position.

※ 8 It is a device to protect DC servo motor when voltage exceeding the measuring range is applied frequently or for a long time.

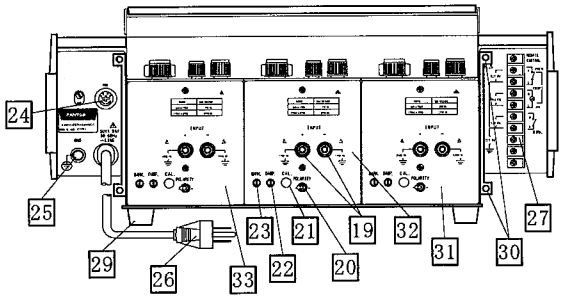
※ 9 External control is also possible.
In such a case, an external control terminal "MARK" is used. (Cautions 1)
Moreover, it can operate also by making it a closed circuit with a point of contact, an anlog switch, and an open collector transistor.

Cautions 1 External operation terminal signal (Operation with TTL level signal is possible.)
High level (+2 to +20V)
····· Chart paper sending (Remote control) → Stop, Event marker → OFF
Low level (+0.8 to −20V)
····· Chart paper sending (Remote control) → Drive, Event marker → ON

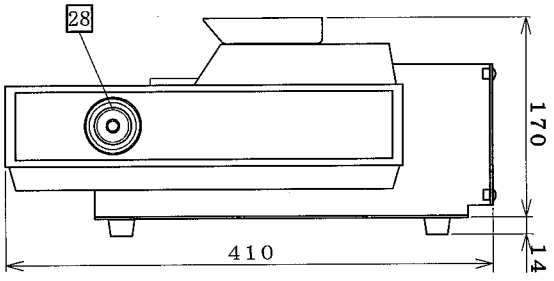
Product number	Drawing name
U-329	UNICORDER U-329 (500) SPECIFICATIONS



Rear view



Side view



No	Name
1	Power supply switch
2	Power supply pilot lamp
3	Chart paper sending switch
4	Chart paper sending pilot lamp
5	Chart paper fast forward switch
6	Chart paper speed change switch
7	Chart paper speed unit change switch
8	Chart paper free knob
9	Event marker switch
10	Channel 1 Pen lift knob
11	Channel 2 Pen lift knob
12	Channel 3 Pen lift knob
13	Chart paper control roller
14	Chart paper cutter
15	Measurement range change switch
16	Measurement range fine-tuning machine (Option)
17	Zero point adjustment machine
18	Zero point check switch
19	Input terminal
20	Polar change switch
21	Full span voltage calibrator
22	Braking adjustment machine
23	Marker amplitude adjustment machine
24	Fuse Holder
25	Grand terminal
26	Power supply code
27	External operation terminal
28	Chart rewind knob
29	Rubber leg
30	Power supply code holder
31	Channel 1 Amplifier unit
32	Channel 2 Amplifier unit
33	Channel 3 Amplifier unit
34	Channel 1 Record pen
35	Channel 2 Record pen
36	Channel 3 Record pen

The shape of the switches No. 6 and No. 7 has been changed.
For details, see the instruction manual.

Drawing Number	Page	Amendment
325D01-00-0011	6/6	H