A Nidec Group Company
SHIMPO

STROBOSCOPE DIGITAL TACHOMETER

DT-315P

INSTRUCTION MANUAL

Manufactured by
NIDEC-SHIMPO CORPORATION
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1. CAUTION

* Do not operate or store in the following places.

1. Explosive areas
2. Places where water,oil,chemical, or dust,etc. exists.
3. Places where temperature is over 40°C.

* Avoid looking at the emitted light for long periods of time. It may hurt your eyes.

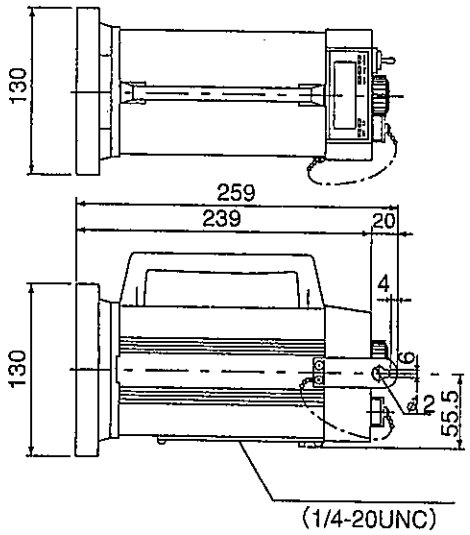
* Do not attempt to disassemble or repair the unit.

* Use tripod screws 1/4-20unc,Length 8mm or shorter for the tripod screw holes on the bottom.

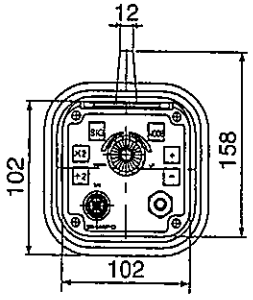
* Charge the battery before using for the first time.

* In 10 minutes after power on, the flashes will stop and display will flicker to protect the life of xenon lamp. To continue measuring, re-power ON.

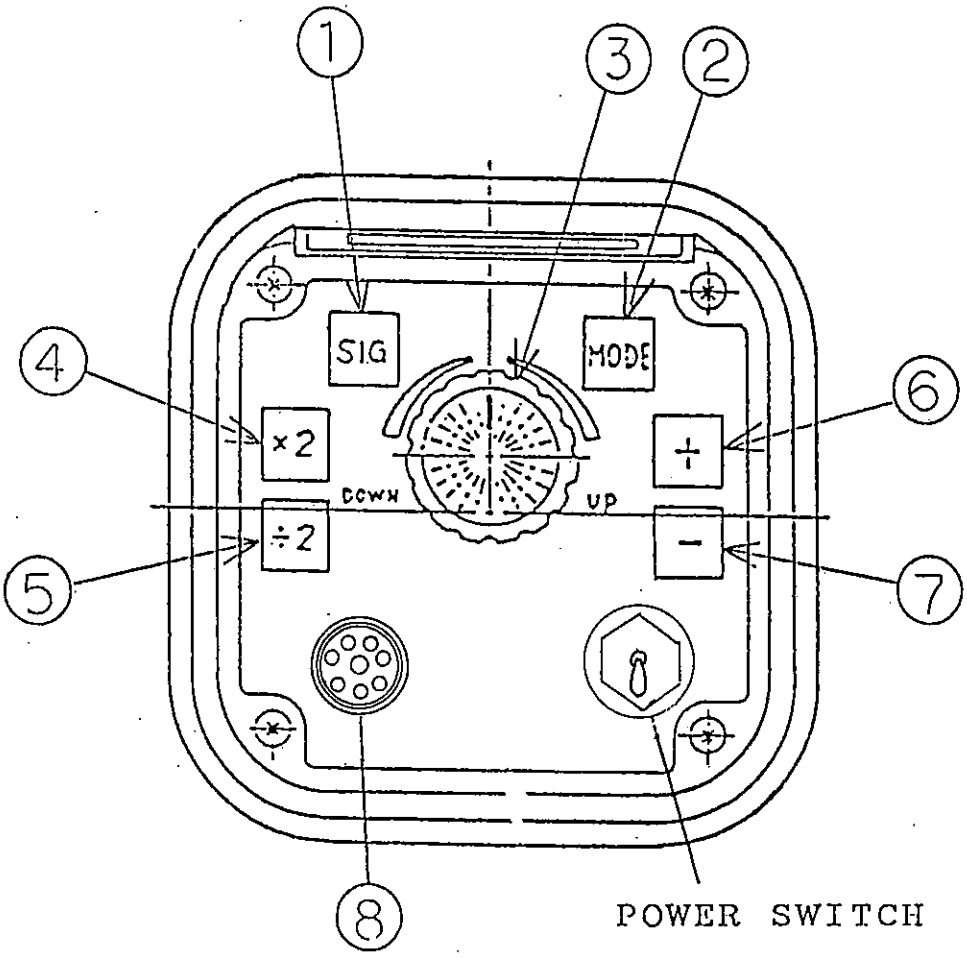
D I M E N S I O N S



DT-315P



2. DESIGNATIONS



1. SIGNAL SWITCH

By depressing SIG, the unit switches from the external mode so the internal and vise-versa. The appropriate LED comes on.

2. MODE SWITCH

When unit is switched to the external mode, everytime the mode switch is depressed the strobe will move; rpm(fpm)-deg-m.sec.

rpm(fpm)---- displays flashes per minute.
External input 100~3,000FPM

deg---- displays flash delay in degrees.

m.sec-- displays the flash delay in m.sec.

3. SETTER

The Setter changes the flashing rate.

External----- For coarse adjustment:clockwise for increasing rate, counter-clockwise for decreasing rate. Setter return to mid-position.

Internal----- For fine tuning. One turn of this switch will change 10 digits in the display.

4. x2 SWITCH

In the internal mode, pressing this switch will double the the flashing rate.

5. ÷ SWITCH

In the internal mode, pressing this switch will decrease the flashing rate by two.

6. PLUS SHIFT SWITCH

When object appears to be standing still, pressing this switch will give the illusion that the object is moving towards the rotating direction at a speed of 1 rotation in 6 sec.

7. MINUS SHIFT SWITCH

When object appears to be standing still,pressing this switch will give the illusion that the object is moving in reverse direction at the speed of a rotation in 6 sec.

8. INPUT & OUTPUT CONNECTOR

PIN#1	+12V
PIN#2	Synchronized Output
PIN#3	Input Signal
PIN#4	0V
PIN#5	—
PIN#6	+15V
PIN#7	0V
PIN#8	Earth

3. OPERATION — INTERIOR SIGNAL MODE

- Interior signal mode INT
- External signal mode EXT

Mode can be changed alternatively by SIG switch.

- Tune mode — rpm display
- Delay mode — Deg display
  - Ms Conversion dispaly

Mode can be changed in order by switch MODE.

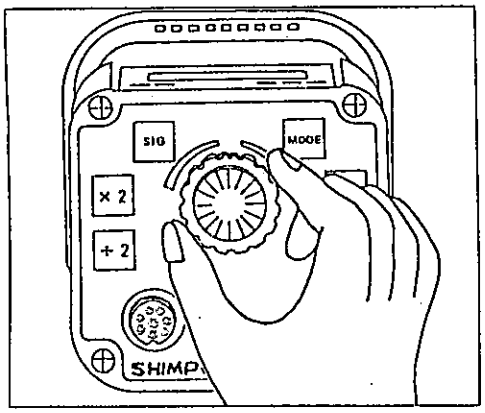
1. Firmly plug power cord into a AC220V single phase.
   Turn POWER SWITCH ON.

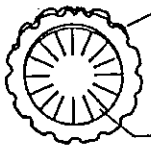
2. If INT lamp will not be ON, press SIG switch.

3. Aim the light beam at the Minus object under observation.

   The most appropriate distance between the strobo and moving object is approx.50cm(2ft).

4. Measuring rpm is done by turning SETTER.





Turn EXTERNAL KNOB to adjust the flashing rate to the rotational speed of the object. The greater the turning angle, the faster the flashing rate.

Turn INTERNAL KNOB to adjust the flashing rate to the rotating speed of the object precisely until the object appears to be standing still.

If the freezed motion is obtained, press x2 , & ÷ 2 switch.

If x2 switch is pressd, 2 freezed figires can be seen overlapped by 180 degree phase shifted.

If ÷ 2 switch is pressed, a freed figure can be seen.

At this moment, actual rpm of the rotating shaft can be displayed.

The phase shifted freezed motion can also be seen when the displayed rpm is 1/2, 1/3, 1/4, etc., of the rotating shaft. Use x2 or ÷ 2 switches effectively and obtain correct rpm.

If the + switch is pressed, the freezed figire will shift toward rotating direction.

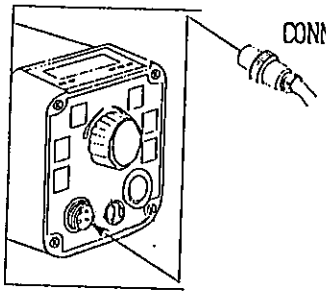
For true RPM readings, see page P.7.

3. OPERATION — EXTERNAL SIGNAL MODE

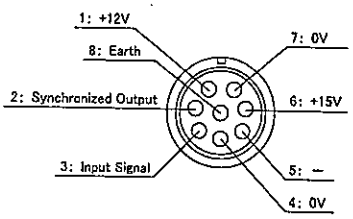
- Interior signal mode INT
- External signal mode EXT
  - Mode can be changed alternatively by SIG switch.
  - Tune mode — rpm display
  - Delay mode — Deg display
    - Ms Conversion dispaly

Mode can be changed in order by mode switch.

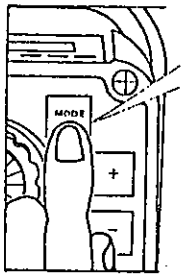
1. Connect signal wires with main body of the instrument after soldering the wires with connectors.



CONNECTOR PIN DESIGNATION



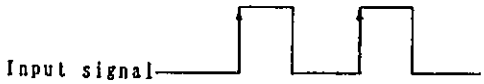
2. Plug the power cord into AC100V(JAPAN), AC120VAC LINE(U.S.A), and AC230V(EUROPE) turn power switch on.



Tune mode and Delay mode are avaible as external signal mode, ca
be selected by MODE switch.

* Tune mode — RPM flashing

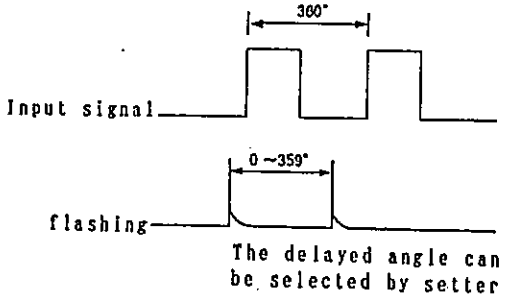
On receiving input signal, the flashing will start and input signal will be converted and displayed in rpm. At this moment the setter does not interfere.



* Delay mode

If input signal cycle is 360° , the flashing will be delayed by 1～359° .
The delayed angle is adjusted by setter.
At this time, the display unit can be selected either in deg. or ms.

deg flashing --- shows angle display
ms flashing --- shows time, converted from angle



* In delay mode, the correct delayed angle can only be obtained by stable input signal.

If the input signal frequency exceeds upper and lower limits,
the alarm mark will be displayed and the strobe will stop flashing.

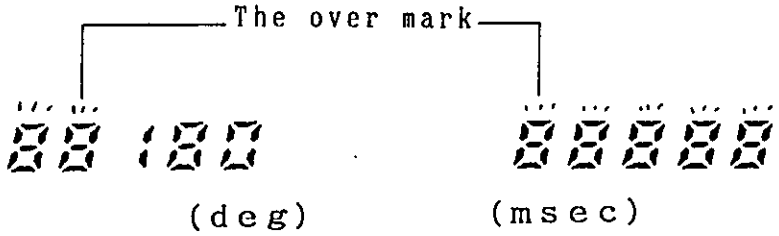
IN RPM DISPLAY MODE

If the input signal exceeds 500Hz, the over mark will be lit.

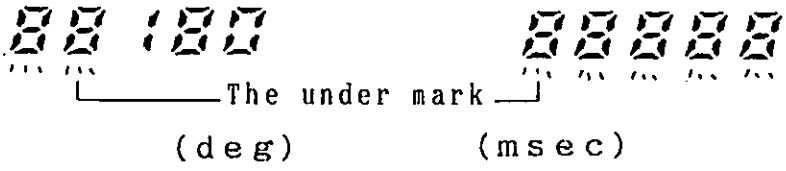
If the input signal is lower than the 1.6Hz, the under mark will be lit.

IN DEG、MSEC DISPLAY MODE

If the input signal exceeds 60Hz, the over mark will be lit.

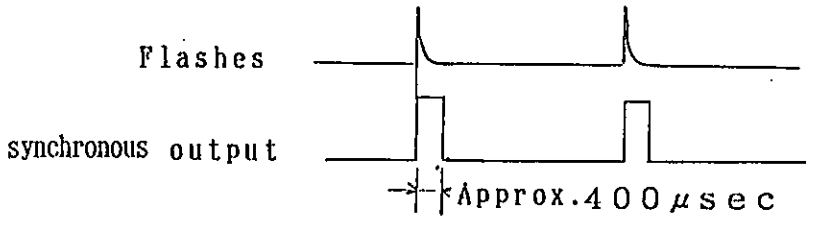


If the input signal is lower than 3.3Hz, the under mark will be lit.

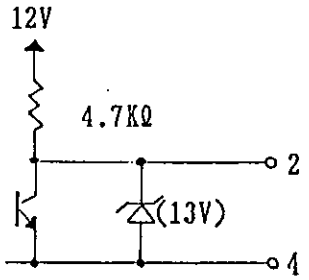


SYNCHRONOUS SIGNAL OUTPUT

The synchronous signal will be output from #2 pin connector.

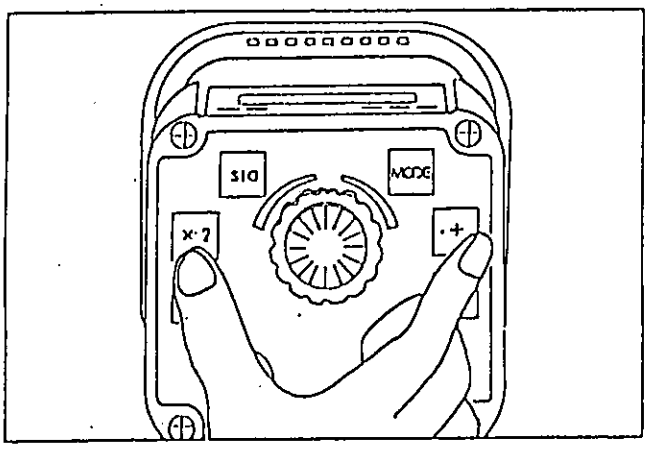


Output Circuitry



MEMORY

All previous settings are stored in memory. When power is turned on, again previous settings will be automatically lockhold.If the memory data have lost by over limit noise, press x2 power +switch at the same time,then switch on the AC power. It makes initial data of memory at the factory shipment.

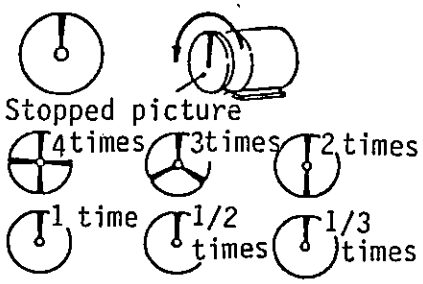


NOTE:

TRUE RPM

All strobes give the illusion of stoppped motion when flashing submultiple of the true speed.

* To obtain correct rpm; Turn dial from high rpm down to low rpm.
When the first single image appears, read the true RPM .
To verify it,press the ÷2 button. A single image would appear again.



Rotation of shaft (rpm)	Number of flashes (rpm)	Flashes/rpm Shaft	Number of stopped picture(s)
at 1,500 rpm	6,000	4 times	4
	4,500	3 times	3
	3,000	2 times	2
	1,500	1 time	1
	750	1/2 times	1
	500	1/3 times	1

FLASH TUBE REPLACEMENT

In use, if the unit is not flashing or flashing blue white in no sound,use the specified flash tube(TFU-100B-A32).

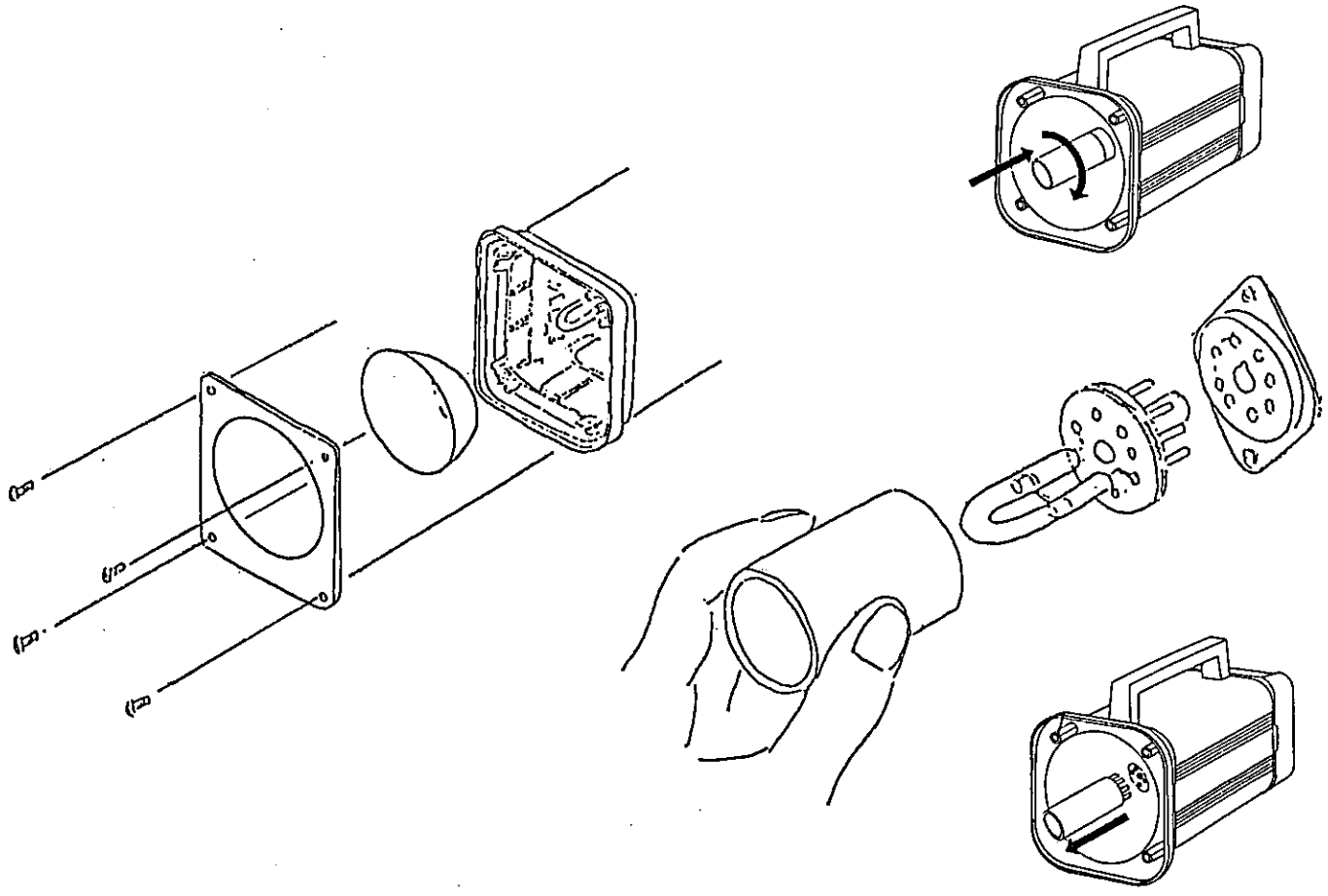
1. Pull out plug from the outlet.
   Wait for 2 or 3 minutes. Be sure stroboscope is cool before proceeding with replacement procedures.

2. Remove the lamp protective window by simply removing the 4 screws.

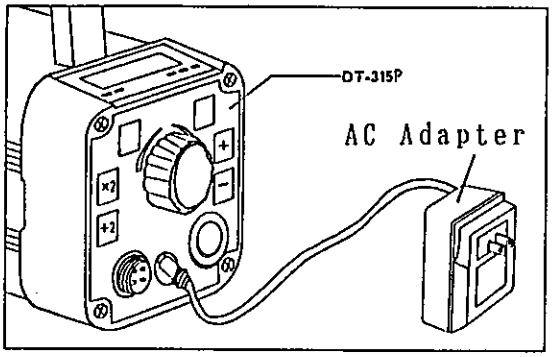
3. Use tube removing tool provided. Insert tool all the way and turn clockwise until tool locks.
   Pull out tube snugly.

4. Install new flash lamp.

5. Press all four corners of protective window into place and then fasten the protective plate with screws.
   Mount reflector in the center so that the reflector wil not interfere with the screw brackets on four corners.



* BATTERY CHARGE

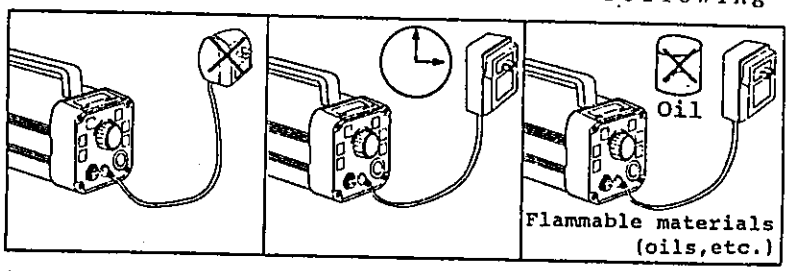


At dispatching, this instrument is in electric discharging condition. Please charge battery of this instrument at initial operation.

1. Turn Power OFF. Plug in to power the provided AC adapter and charge batteries for approx.10 hours.
   The AC adapter/charger can be used to power the strobe for up to 10 hours, then it must be disconnected in order to preserve battery life. The same is true when charging battery without strobe flashing.

2. During operation,if the electricity is discharged fully, the following message will be displayed and the flashing will stop. LLLLL

Do not charge battery as in the following manner.



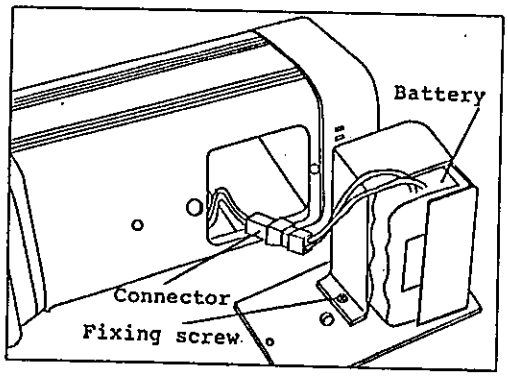
Do not use other brand AC adapter.

Do not charge for over 10 hours.

Do not charge battery at the place where flammable materials are.

BATTERY REPLACEMENT

The life of the built-in battery is 300 times of charges.
If the recharging time becomes shorten,the life of the battery is almost worn out. Replace the battery with the new one.



CONTINUOUS OPERATION BY EXTERNAL POWER

* Operation by A.C.adapter provided.
  Using the provided AC Adapter, the instrument can be operated However, do not operate it over 10 hours to avoid overcharging on built-in batteries.
  If you will operate with AC Adapter provided,plug off connecter of the built-in batteries as in the process of battery replacement.

* Operate by other power

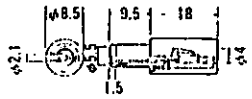
  Before operation, remove connector of the batteries to protect built-in batteries.

  External power specifications

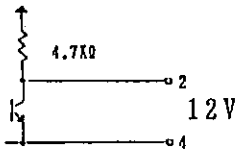
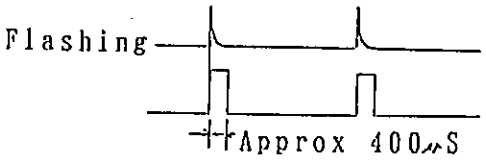
  DC 9～14.5V MAX 40mA

  If power is too high, ***** will be displayed.

  Plug



SPECIFICATIONS DT-315P

INTERNAL SIGNAL MODE	
FLASHING RANGE	60.0～3000FPM
DISPLAY ACCURACY	±0.01%
DRIFT	±0.01% (at 0～40℃)
UPDATE TIME	(Approx.) 0.2 seconds
TUNE OUTPUT SIGNAL	Approx.12V  
OTHER FUNCTIONS	x1/2. x2 Flashings, Phase shift adjustment
EXTERNAL SINGAL MODE	
FLASHINGS	In synchronous mode, 60.0～3000FPM In delay mode : 200～3,000FPM
DELAY ANGLE SETTING RANGE(In delay mode)	0～359° Set by 1°
DISPLAY	RPM in synchronous mode, 60.0～3000FPM DELAY ANGLE in delay mode, 0～359° or 0～300mS conversion display
DISPLAY ACCURACY	±0.01% plus ±1 digit in synchronous mode +0 -0.2mS plus ±1 digit delay mode
UPDATE TIME	1 second
INPUT SIGNAL	H level 2.5～12V *50μs or over for H.L level L level 0～0.4V *Trigger at rising edge *Approx. 10Ω↿impedance
SENSOR POWER	Operate by built-in battery:6.8～11.0V Operate by adapter:10.2～12.2V MAX 40mA Operate by DC 9～14.5V:7.8～14.1V (include max. 0.6V Ripple)

SPECIFICATIONS

DISPLAY	5 digit, 7segment red LED(Character height 10mm)
SETTER	FLASHING,DELAY ANGLE:JOG SHUTTLE MODE, DISPLAY UNIT:TACT SWITCH
FLASHTUBE	Xenon lamp TFU-100B-A32
FLASHTUBE POWER	MAX.10W
FLASHING TIME	Approx.30μSec
POWER	*Operation by built-in battery Nicd battery, 8KR-2000sce SANYO Operating time:approx.1hour(Full charge at 3,000FPM) Battery charge time:approx.10 hours Charge with the provided adapter. Do not charge battery over 24 hours. Operation during charging can be possible. As the charging is made during operation, do not operate over 10 hours continously. *Operate by external power Plug off connecter of the built-in battery before operating the instrument by external power to avoid overcharging of the battery. DC9～14.5V, Max 24W (Current consumption is 24W/input voltage) or operate by provided adapter AC220V ±10%,50Hz,Max.40VA
OPERATING TEMPERATURE	0-40° C
WEIGHT	Approx.2.1kg
POWER PLUG	PJ-2(Sato parts) or the equivalent
ACCESSORIES	INPUT/OUTPUT SIGNAL PLUG AC adapter