Catalogue

Catalogue……..1

1. Brief introduction……2

1.1 YJX-058A thermal dot line printing mechanism……2
1.2 Characteristic……..2
1.3 Explanation……..2

2. Specification……..3

3. Print head parameter……4

3.1 Rating parameter……4
3.2 Maximum permit parameter……...4
3.3 Recommend parameter……..5
3.4 Calculate formula……5
3.5 Thermistor……6
3.6 Electric parameter……7
3.7 Time sequence characteristic……8
3.8 caution……10

4. Stepping motor……11

4.1 stepping motor parameter……11
4.2 stepping motor phase position……11
4.3 stepping motor drive……12

5. Paper detection……13

5.1 paper detection…….....13

6. Pin assignment……15

7. Mechanism design reference……16

7.1 Easy loading paper structure design……16
7.2 Paper container structure design……...17
7.3 Assemble structure size……..17
7.4 Mechanical dimension……18

1. Brief introduction

1.1 YJX-058A Mini thermal dot line printing mechanism

of a number of franchised companies to print more uniform design, operation more stable movement of small size, wide operating voltage (4.2 V-8.5V), high efficiency, and other features. Unique design allows YJX-058A is easily installed paper, high reliability characteristics.

1.2 Characteristics

◆ Easy loading paper
◆ small size, light weight
◆ base-metal, metal gear shaft, stable, reliable, high life, excellent thermal properties
◆ print speed (up to 60 mm / s)
◆ Power relief work (4.2 V-8.5V)
◆ print high accuracy (8 dots / mm)
◆ mechanical wear-resistant long life (more than 50 km)
◆ low noise: brushless magnetic incentive stepper motor drive; high wear resistance, low temperature resistant high gear special engineering plastics components to a very low noise transmission.
◆ Applicability: YJX-058A in the installation of structural and electrical socket and compatible with YJX-058A 628MCL101 movement, YJX-058A S installed in the structure and electrical socket and compatible with -628MCL103 movement of instruments applicable to micro-thermal printers and thermal printing paper, such as electronic cash registers.

1.3 Description

The manual describes movement YJX-058A/RS series of electrical characteristics and mechanical properties. That is the movement of the composition, the basic parameters of the scope of adaptation, as well as peripheral interface definitions and structure size. The Company reserves the right to amend this manual or improved it. If you need the latest version of the manual, can be directly and Ningbo Technology Co., Ltd..
Not in accordance with this manual for the design, Ningbo Technology Co., Ltd does not guarantee the reliability of its work.

2 Specifications Parameter

Project	explanation
Print method	Thermal
Effective printing width（mm）	48
Heater resolution（dot/mm）	8
Printing Dots of per line	384dots
Paper width	58
Dot pitch（mm）	0.125mm
Dot size	0.125mmx0.12mm
Printing speed	70mm/s
Thermal head temperature detection:	Via thermistor
Paper detection:	Via photo interrupter
Head working voltage(V)	4.2~8.5
Logic voltage(V)	2.7~5.25
Motor voltage	4.2~8.5
Operating temperature:	+0℃~50℃
Operating humidity	20%~85%RH
store temperature	-20℃~60℃
store humidity	5%~95%RH
Machine noise	<60dB
Platen open-close times	>5000 times
Thermal paper traction force	≥50g
Thermal paper grasp brake force	≥80g
Printing life	>50km,Thermal life is 10^8 pulse
Mass(g)	40.5
Outline dimension(D x W x H)	72±1.5mm*33±0.5mm*15.5±0.5mm

3. Thermal head Parameter

3.1 rated parameters

Heating points	384dots/line
Dot pitch	0.125mm
Dot size	0.125mm*0.12mm
Per step	0.0625mm
printing width	48 mm
Paper width	54 mm
average resistance	176Ω±4%
Working voltage	4.2V-8.5V
Pulse life	10^8 pulse
Machine wearing life	50km
Life test condition	25℃
The time of heating not less than	12.5%.

3.2 the maximum permit parameter (environment temperature25℃)

parameter	code	Maximum Ratings	condition
Loop printing	S.L.T	1.25	Tsub=25℃
Heating energy		0.20 mJ/dot	
Heating voltage	VH	8.5V	Normal voltage 7.2V
Logic voltage	Vdd	7V	Including the maximum voltage
Logic input voltage	Vin	-0.5V~Vdd+0.5V	
Working voltage	Ta	65℃	Thermistor temperature
printing dots		64 dots	

3.3 Recommend parameter

item		code	electric parameter	Term
Consume power		P。	0.24W/dot	Rav=176Ω,Vdd=5V, printing dots： 64dots
Furnish voltage		VH	7.2V	
Loop print		S.L.T	1.25ms/line	
consume energy	5	E。 (Ton)	0.16mJ/dot(0.67ms)	64dots same time heating
	25		0.13mJ/dot(0.54ms)	
	45		0.11mJ/dot(0.46ms)	
Consume current		I。	2.4A	

3.4 count formula

Heating energy by the following formula:

$$P_0 = I_0^{\,2} \times Rav = \frac{VH^{\,2} \times Rav}{(Rcom \times N + Rav + Ric + Rlead)^2}$$

$$\because Ton = \frac{E_0}{P_0}$$

$$\therefore P_0 = \frac{E_0}{Ton}$$

$$VH = \sqrt{p_0 \div Rav} \times (Rcom \times N + Rav + Ric + Rlead)$$

thereinto：

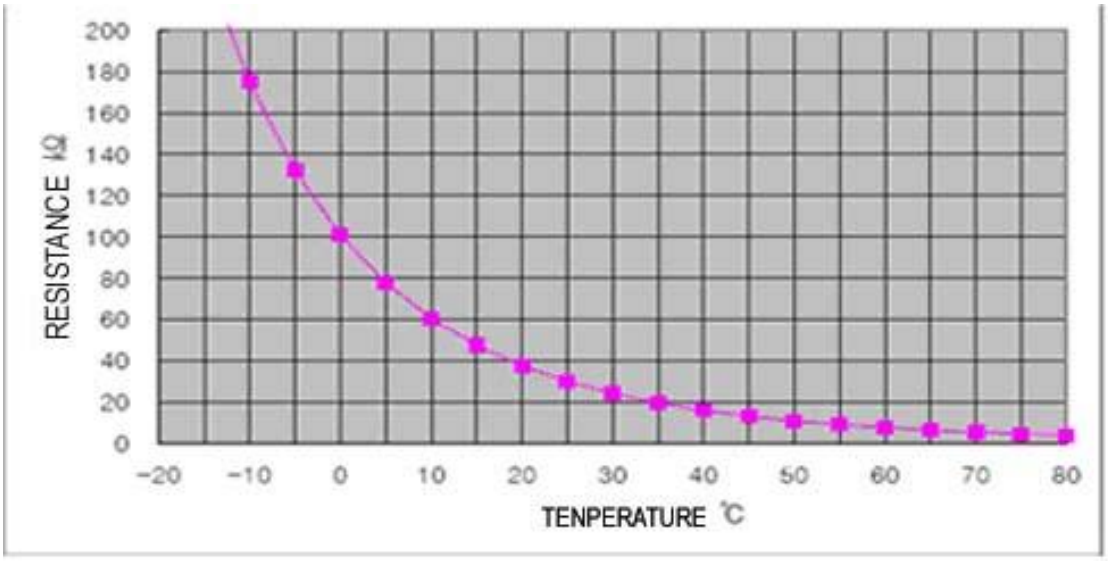
Rav:	average resistance	176Ω
N:	contemporary print 64dots	64dot
Rcom:	common resistance	0.05Ω
Ric:	drive resistance	6Ω
Rlead:	lead resistance	10Ω

3.5 thermistor

count formula: $R_X = R25 \times EXP[B \times (\frac{1}{T_X} - \frac{1}{T25})]$ (T: absolute temperature)

thereinto:

B	constant	3950K±2%
R25	resestance rate	30KΩ±5%(在 25℃)
Tx	operating temperature	-20℃~+80℃
T25	1pulse width operating temperature	25℃



Thermistor temperature graph

Thermistor temperature form:

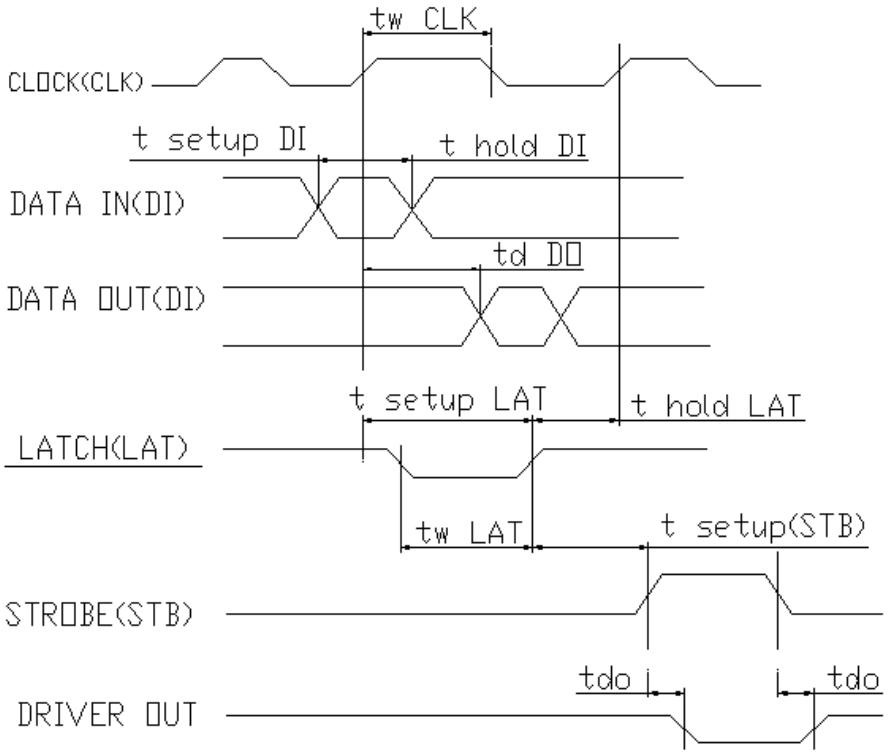
Temperature (℃)	Resistance (KΩ)	Temperature (℃)	Resistance (KΩ)	Temperature (℃)	Resistance (KΩ)	Temperature (℃)	Resistance (KΩ)
-20	269	10	60	40	15.9	70	5.21
-15	208	15	47.1	45	13.1	75	4.4
-10	178	20	37.5	50	10.8		
-5	124	25	30.0	55	8.91		
0	100	30	24.2	60	7.41		
5	78	35	19.6	65	6.2		

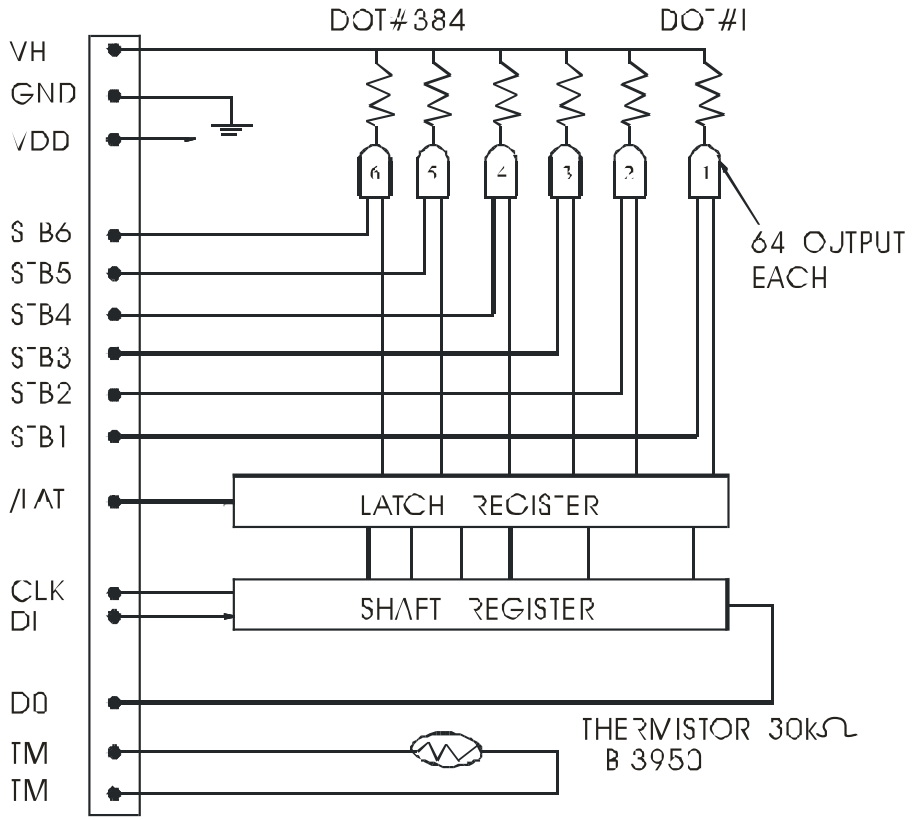
3.6 Electric parameter (25±10℃)

Item	Code	Least	Typical	Most	Unit	Term
Print voltage	VH	--	--	8.5	V	
Logic voltage	Vdd	2.7	5.0	5.25	V	*1
Logic current	Idd	--	--	54	mA	fDI=fclk/2
Input voltage(high)	VIH	0.8Vdd	--	Vdd	V	STB, DI, LAT, CLK
Input voltage(low)	VIL	0	--	0.3Vdd	V	
Latched dinput current(high)	IIH	--	--	3.0	μA	
Heating input current(high)		--	--	30		
Clock input current(high)		--	--	3.0		
Data input current(high)		--	--	0.5		VIH=5V
Latch input current(low)	IIL	--	--	-3.0	μA	
Heating input current (low)		--	--	-0.5		
Clock input current (low)		--	--	-3.0		
Data input current (low)		--	--	-0.5		VIL=0V
Data output voltage(high)	VDOH	4.45	--	--	V	Open , Vdd=4.5V
Data output voltage (low)	VDOL	--	--	0.05	V	
Output voltage	VOL	--	(1.0)	--	V	Drive output part, reference

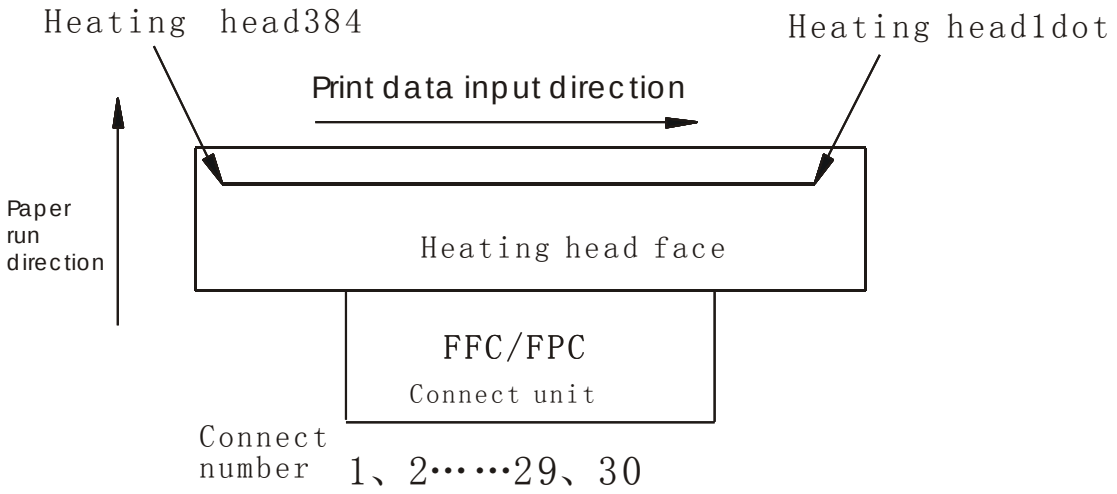
3.7 Time Characteristic (25±10℃)

Parameter	Code	Speed			Unit	Term
		Least	Typical	Most		
Clock frequency	fCLK	--	--	8	Hz	3≦Vdd≦5.525
		--	--	5	MHz	2.7≦Vdd<3
Clock width	twCLK	30	--	--	ns	Inquiry time
Data establish time	testup DI	30	--	--	ns	
Data maintenance time	thold DI	DI	--	--	ns	
Data time delay	td DO	--	--	120	ns	
		--	--	150	ns	
Latch pulse width	tw LAT	100	--	--	ns	
Latch establish time	testup LAT	200	--	--	ns	
Latch maintenance time	thold LAT	50	--	--	ns	
Heating establish time	testup STB	300	--	--	thold DI	
Output time delay	tdo	--	--	10	μs	5V(Vdd)
		--	--	60	μs	2.7V(Vdd)


tw CLK
CLOCK(CLK)
t setup DI
t hold DI
DATA IN(DI)
td DO
DATA OUT(DI)
t setup LAT
t hold LAT
LATCH(LAT)
tw LAT
t setup(STB)
STROBE(STB)
tdo
tdo
DRIVER OUT


DOT#384
DOT#1
VH
GND
VDD
S B6
S B5
S B4
S B3
S B2
S B1
/LAT
CLK
DI
DO
TM
TM
64 OUTPUT EACH
LATCH REGISTER
SHAFT REGISTER
THERMISTOR 30kΩ
B 3950

Gating (STB) No	Dot No	Dot/foot
1	1 to 64	64
2	65 to 128	64
3	129 to 192	64
4	193 to 256	64
5	257 to 320	64
6	321 to 384	64



（**Caution：this photo's direction is face the thermal head**）

3.8 Notice item

When close the printing mechanism, please turn off the power.

Heating control signal

When the printing mechanism voltage is open/close, please pay attention to the heating control signal close you must assure the following voltage

VH 0V~10V Vdd 0V~7V

Other signal GND-0.5V~ Vdd+0.5V

4 Stepping motor

Stepping motor go ahead one step, the paper go ahead 0.0625mm.

4.1 Stepping Motor Parameter

Item	Specification	Term
Rated voltage	4.2~8.5V	
Phase	2phase	
Step angle	9degrees by 1-2phase excitation	
Step distance	0.0625mm	
Phase resistance	10Ω±7%	20℃
Phase current	0.357A	
Drive way	1-2 phase excitation of the bipolar	

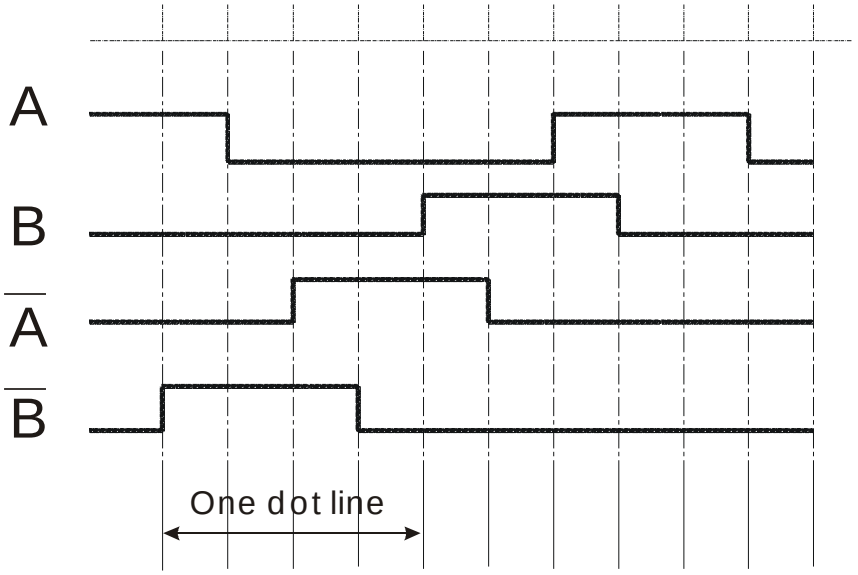
4.2 Stepping Motor Phase

YJX-058A stepping motor with the 1-2 phase excitation of the bipolar, there are 4 position。**As the table below shows:**

Position	STEP1	STEP2	STEP3	STEP4
A	+	-	-	-
B	-	-	-	-
$\overline{A}$	-	-	+	+
$\overline{B}$	+	+	+	-

Driving procedures of the stepping motor （1-2phase）

Motor shift CCW （face motor gear）



4.3 Drive of the stepping motor

We recommend use the PWM mode in the stepper motor drives, such as the L3967 or driver chips. For different motor speed using different drive current. This will effectively reduce the stepper motor fever, and effectively reduce the noise Step print.
The following table for the largest movement of the stepper motor speed drives

Operating temperate	Frequency of the motor drive	Duty cycle (%)
5.0DCV	500PPS	60
7.2 DCV	1050PPS	30
8.5 DCV	1120PPS	15

To avoid stepping motor overheating, the design of the complete machine on the table as far as possible below the duty cycle; if you want to the electricity is open, the longest time of not more than 30 seconds.

5 paper detection and platen ready detection switch

5.1 Paper Detection

YJX-058A /RS serial adopt a reflective photoelectric sensor detection-off, the major role of the photoelectric sensors is：
A: paper detection

B: through the sign of printing paper we can position the print paper

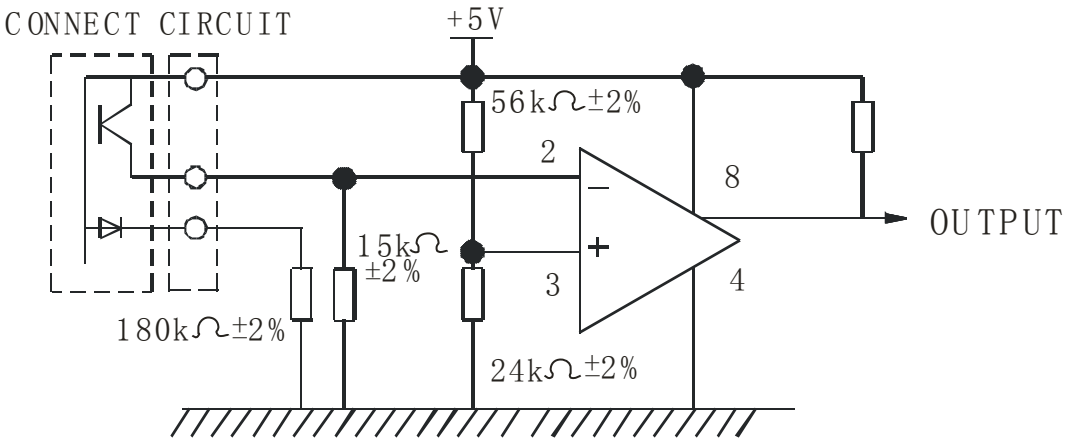
As shown below, when the shortage of paper, issued by the photoelectric detection can not be reflective optical, output HIGH. When it is normal paper, a photoelectric detection of light being reflected by the reception, low output, optoelectronic switching circuit driven, as shown below, when the shortage of paper, the printer will not start heating, when the lack of paper , the input must reduce speed (decreasing drive motor-driven pulse frequency PPS).

The parameter of the largest

Item		Code	Number	Unit
Input	positive direction current	IF	50	mA
	opposite direction current	VR	5	V
	The lowest power	P	70	mW
Output	Collector to emitter voltage	VCEO	20	V
	Emitter to collector voltage	ECO	5	V
	Collector current	IC	20	mA
	The lowest power of Collector	PC	70	mW

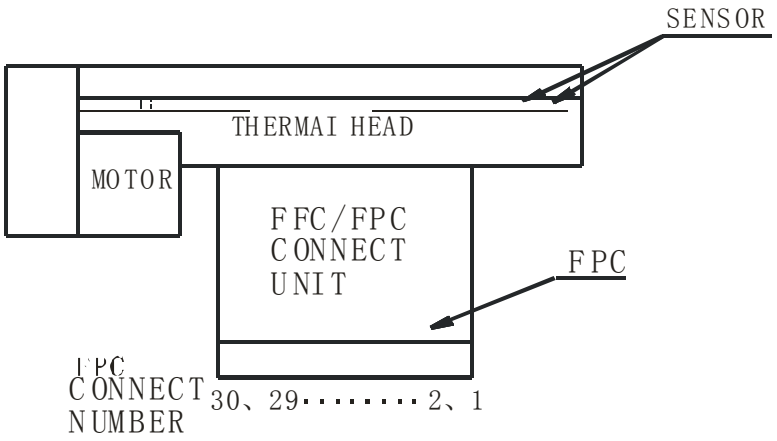
Photoelectricity parameter (25℃):

Item		Item	Condition	Number			Unit
Input	Positiv direction current	VF	IF=10mA	1.0	1.2	1.6	V
	opposite direction current	IR	VR=5V			10	μA
Output	Collector to emitter voltage	BVCE0	IC=0.5mA	20			V
	Emitter to collector voltage	BVEC0	IE=0.1mA	5			
	Collector dark current	ICE0	VCE=10V IF=0mA			200	nA
Coupling characteristic	Collectortoemitter saturation voltage drop	VCE(SAT)	IC=2mA Ee=1mW/cm2			0.4	V
	Sensor current	Ic	VCE=5V IF=10mA	150		600	μA
	drain current	ILEAK	IF=10mA VCE=5V			1	μA
	ascend/decline time	Tr/Tf	VCE=5V IF=1mA RL=100Ω		5/5		μs



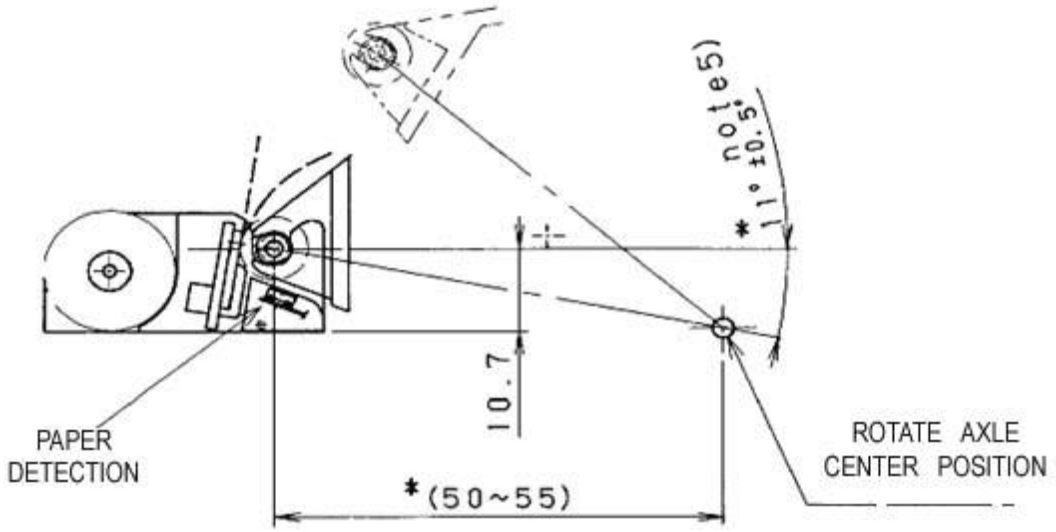
6. interface definition

No.	Symbol	Signal name	No.	Symbol	Signal name
1	PHK	Cathode for photo interrupter	16	TM	thermistor
2	VSEN	Paper sensor power	17	TM	thermistor
3	PHE	Emitter for photo interrupter	18	STB3	Strobe 3
4	N.C	Non contact	19	STB2	Strobe 2
5	N.C	Non contact	20	STB1	Strobe 1
6	VH	Head drive power	21	GND	Head ground
7	VH	Head drive power	22	GND	Head ground
8	DI	Data in	23	LAT	Data latch
9	CLK	clock	24	DO	Data out
10	GND	Head ground	25	VH	Head drive power
11	GND	Head ground	26	VH	Head drive power
12	STB6	Strobe 6	27	$\overline{MT/A}$	Excitation signal$\overline{A}$
13	STB5	Strobe 5	28	MT/A	Excitation signalA
14	STB4	Strobe 4	29	$\overline{MT/B}$	Excitation signal$\overline{B}$
15	Vdd	Logic power	30	MT/B	Excitation signalB

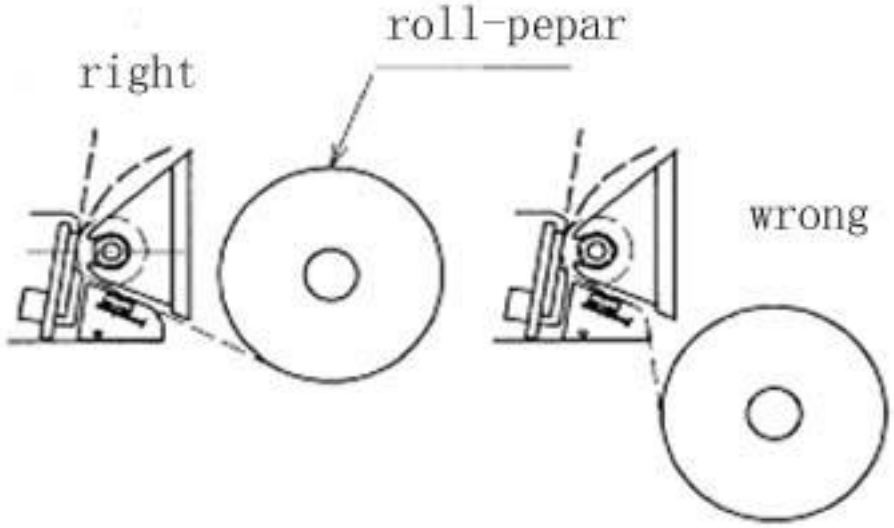


7 .Mechanism design reference

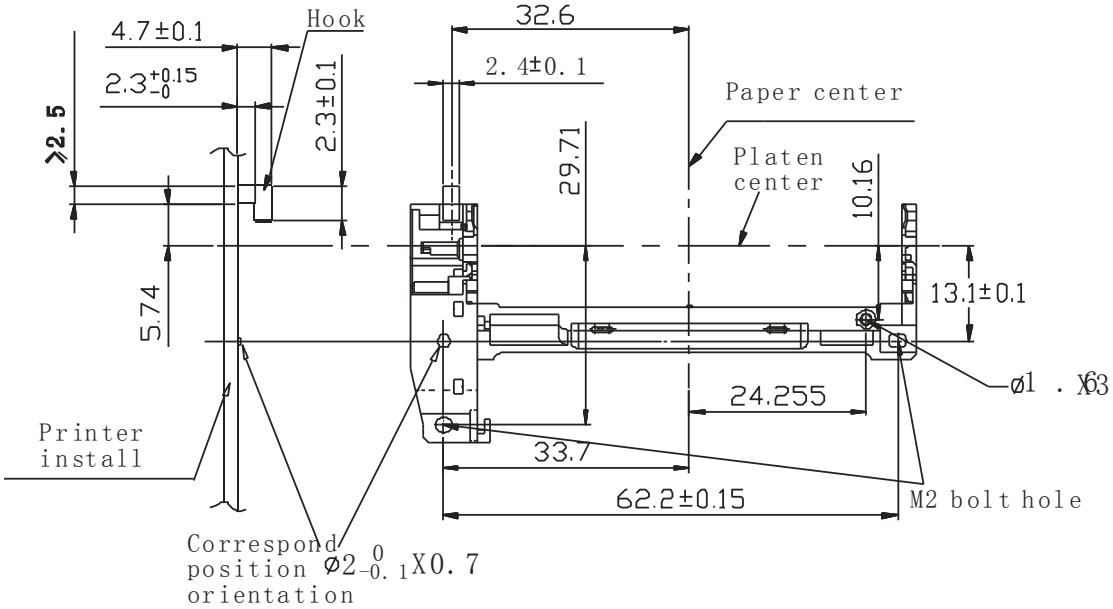
7.1 Easy loading paper structure design



7.2 Paper container structure design



7.3 Assemble structure size



7.4 Mechanical dimension