

# *SPECIFICATIONS*

## *Motor Driven Magnetic Card Reader*

Triple track reader

MTM-590-3R-0102

Track 1,2,3

*NEURON Corporation*

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## 1 OUTLINE

This is specification to describe the technical characteristics of NEURON motor driven magnetic card reader (MTM-590-3R-0102).

MTM-590-3R-0102 has functions as following.

- (1) All three tracks reading by one transporting operation.  
Applicable card : ISO 7810 ID-1,7811/1,2,3,4,5 and 6
- (2) Capability of insertion and ejection from the both side.
- (3) With Shutter.
- (4) When card is stopped and pinched by transporting roller, next functions are capable without roller's damage.
  - a) Pull out by hand.
  - b) Take card into MTM.

## 2 APPLICABLE CARD SPECIFICATION

- |                              |   |
|------------------------------|---|
| (1) Physical characteristics | :Accordance with ISO 7810 and 7816-1  |
| (2) Card dimensions          | :Accordance with ISO 7810 ID-1-type card  |
| (3) Embossing                | :Accordance with ISO 7811-1,-3  |
| (4) Recording format         | :Accordance with ISO 7811-2,-4,-5,-6  |
| (5) Recordable capacity      | :Track 1: 79 characters max. (6 bit + 1 parity)<br>Track 2: 40 characters max. (4 bit + 1 parity)<br>Track 3:107 characters max. (4 bit + 1 parity) |
| (6) Recording method         | :Two Frequency Coherent Phase Recording (F2F)   |
| (7) Allowance of card warp   | :2mm max.   |
| (8) Coercive force           | :24k to 320k A/m (300 to 4000 Oe) +/-10%  |

## 3 CARD CARRYING SYSTEM

- |                              |  |
|------------------------------|--|
| (1) Power source             | :DC motor  |
| (2) Card carrying mechanism  | :Rubber roller   |
| (3) Card insertion direction | :Both of front and rear side (Front side insertion by first data bit of card / Rear side insertion by last data bit of card)             |
| (4) Card carrying direction  | :From Card gate(with plastic bezel) to Head by forward carrying from Head to Card gate(with plastic bezel) by reverse carrying           |
| (5) Card ejecting direction  | :Both of front and rear side (Drop down by rear side)  |
| (6) Card location detector   | :3 positions of LED & photo transistor<br>NOTE: Perhaps do not detect high transmittance card, because detect the card by infrared rays. |
| (7) Card read direction      | :forward carrying only (Errors increase in reverse carrying)   |

## 4 GENERAL SPECIFICATION

- (1) Card carrying speed :190mm/s +/-10%
- (2) Machine cycle time :1.5s approx.
- (3) Acoustic noise :80dB max. (At 150mm distance from the gear side with condition A by installing on 2mm thick rubber sheet)
- (4) Dielectric strength :DC 500V for 1 min (Between power line and frame)
- (5) Insulation resistance :10M ohm min. at DC 500V

## 5 SHUTTER SPECIFICATION

- (1) Power source :DC solenoid
- (2) Card detection method :Magnetic data detection(9 bits approx.)
- (3) Magnetic data detection position :Track 2
- (4) Card insertion speed :100 to 400mm/s

## 6 MAGNETIC HEAD SPECIFICATION(CARD READER)

- (1) Construction :3 Tracks read head
- (2) Number of tracks :3 Tracks
- (3) Reading width :1.0mm

## 7 MAGNETIC HEAD SPECIFICATION(SHUTTER)

- (1) Construction :1 Track read head
- (2) Reading width :1.5mm

## 8 POWER REQUIREMENTS

- (1) Rating voltage :DC +12V +/-5%
- (2) Ripple voltage :100mVp-p max.
- (3) Rating current :1.5A min.

## 9 OPERATING CONDITION

- (1) Operating circumstance :Indoors and lightening by fluorescent lamp with 1000lx max. or equivalent
- (2) Mounting direction :Horizontal (motor to be topside)
- (3) Operating temperature / humidity : 0 to 50°C (non-condensing)  
20 to 80% RH (non-condensing)
- (4) Storage temperature / humidity :-20 to 70°C (non-condensing)  
20 to 80% RH (non-condensing)

## 10 DURABILITY

- |     |                        |  |
|-----|------------------------|--|
| (1) | Temperature / humidity | :No defect in all items of the characteristics from the 12h on normal condition after exposed 96 h on 40+/-3°C / 90 to 95% RH (non condensing).                            |
| (2) | Vibration              | :No defect in all items of the characteristics under normal condition after exposed 15min. each on X,Y and Z directions of 2mm amplitude, from 10 to 50Hz/min vibration.   |
| (3) | Shock                  | :No defect in all items of the characteristics under normal condition after shocked one time on X,Y and Z directions of 294m/s <sup>2</sup> ,11ms peak acceleration shock. |
| (4) | Life(card reader)      | :Magnetic head :500,000 passes min.<br>Rubber roller :300,000 passes min.<br>Motor :300,000 passes min.<br>Others :500,000 passes min.                                     |
| (5) | Life(shutter)          | :Magnetic head :500,000 passes min.<br>Solenoid :300,000 switches min.<br>Microswitch :300,000 switches min.<br>Others :500,000 switches min.                              |

One pass means one round-trip.

Normal condition(circumstance) should be defined as 20+/-5°C ,35 to 60% RH.

Life values are based on our testing condition

## 11 PHYSICAL CHARACTERISTICS

- |     |                      |                      |
|-----|----------------------|----------------------|
| (1) | Dimension            | :Shown in APPEARANCE |
| (2) | Mass                 | :Approx. 570g        |
| (3) | Length of protrusion |                      |

This reader is shorter than old series to increase functions.

Therefore card protrudes from rear side of reader in reading operation.

Variously by the software control when reverse carrying, if reversed

50 us after the sensor of reversal detect the card include

the software control, the length of protrusion is 65mm approx.

## 12 EMC PROTECTION REQUIREMENTS

- (1) A metal enclosure (Reference material:Iron,Aluminium etc,thickness:0.6 to 2.0mm or equivalent) connected to protective earthing terminal shall be used.
- (2) Proper PE(Protective Earth) connection shall be ensured in final installation.
- (3) A noise filter(ZUG2203-11A(TDK Corp.)or equivalent) shall be used at the AC mains input of the DC power supply.

## 13 I/O INTERFACE CONNECTOR

- (1) Power supply J1: IL-S-4P-S2L2-EF  
(Produced by JAE:Japan Aviation Electronics Industry Ltd.)

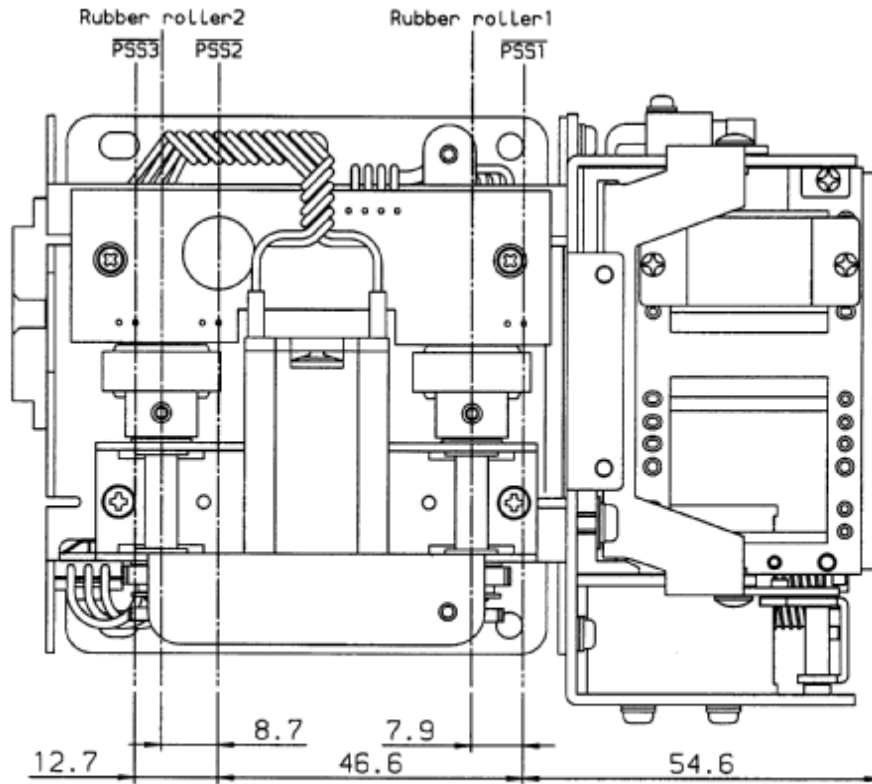
Pin No.	Signal Symbol	I/O	Description
1	Vcc	-	Power for circuit(DC+12V)
2	Vcc	-	Power for circuit(DC+12V)
3	GND	-	Ground
4	GND	-	Ground

- (2) Interface for input / output J10: TX1-30P-D2LT-MN(Produced by JAE)

Pin No.	Signal Symbol	I/O	Description
1	GND	-	Ground
2	GND	-	Ground
3	-	-	(System Reserved)
4	-	-	(System Reserved)
5	-	-	(System Reserved)
6	-	-	(System Reserved)
7	/PSS1	O	Position Sensor Signal #1
8	/PSS2	O	Position Sensor Signal #2
9	/PSS3	O	Position Sensor Signal #3
10	-	-	(System Reserved)
11	/RDP1	O	Read Data Pulse Track 1
12	/RCP1	O	Read Clock Pulse Track 1
13	/CLS1	O	Card Loading Signal Track 1
14	/DCD1	I	Decoder Chip Disable Track 1
15	/RDP2	O	Read Data Pulse Track 2
16	/RCP2	O	Read Clock Pulse Track 2
17	/CLS2	O	Card Loading Signal Track 2
18	/DCD2	I	Decoder Chip Disable Track 2
19	/RDP3	O	Read Data Pulse Track 3
20	/RCP3	O	Read Clock Pulse Track 3
21	/CLS3	O	Card Loading Signal Track 3
22	/DCD3	I	Decoder Chip Disable Track 3
23	/SCD	O	Shutter Card Detected
24	/SOE	I	Shutter Open Enable
25	/SOA	O	Shutter Open ACK
26	-	-	(System Reserved)
27	MDDR	I	Motor Drive Direction Reverse
28	/MDSE	I	Motor Drive Start Enable
29	GND	-	Ground
30	GND	-	Ground

[NOTE] “/” in table means Negative Logic.

### 14 SENSOR POSITION DIAGRAM



/PSS1	Motor drive start position
/PSS2	Inversion position detection of card feed
/PSS3	Status for card entity

## 15 I/O INTERFACE

### (1) Input electrical characteristics

Signal	Input voltage		Input current	
	V <sub>IL</sub>	V <sub>IH</sub>	I <sub>IL</sub>	I <sub>IH</sub>
/DCD#	1.50V	3.50V	-10 microA	10 microA
MDDR	0.70V	3.00V	-1 microA	0.57mA
/MDSE	1.50V	3.50V	-1 microA	1 microA
/SOE	1.13V	3.15V	-1 microA	1 microA

[NOTE] “#” in table means Track No.

### (2) Output electrical characteristics

Signal	Output voltage		Output current	
	V <sub>OL</sub>	V <sub>OH</sub>	I <sub>OL</sub>	I <sub>OH</sub>
/PSS*	0.4V	4.0V	8mA	-10 microA
/RDP#	0.4V	3.5V	8mA	-4mA
/RCP#	0.4V	3.5V	8mA	-4mA
/CLS#	0.4V	3.5V	8mA	-4mA
/SCD	0.4V	3.5V	8mA	-4mA
/SOA	0V	3.5V	0.5mA	-0.15mA

[NOTE] “\*” in table means Sensor No.

### (3) Contents of Input / Output signal

#### a) /MDSE: Motor Drive Start Enable

Signal	Motor drive	
	Start	Stop
/MDSE	L	H

#### b) MDDR: Motor Drive Direction Reverse

Signal	Motor drive	
	Forward	Reverse
MDSE	L	H

#### c) /PSS\*: Position Sensor Signal

Signal	Card Existence	
	Exist	Don't exist
/PSS*	L	H

#### d) /DCD#: Decoder Chip Disable

Signal	Mode of Decoder	
	Read	Stop
/DCD#	H	L

#### e) /RDP#: Read Data Pulse

Signal	Data	
	1	0
/RDP#	L	H

f) /CLS#: Card Loading Signal

Signal	Status	
	Normal	Abnormal
/CLS#	L	H

g) /SOA: Shutter Open ACK

Signal	Shutter	
	Opening	Closed
/SOA	L	H

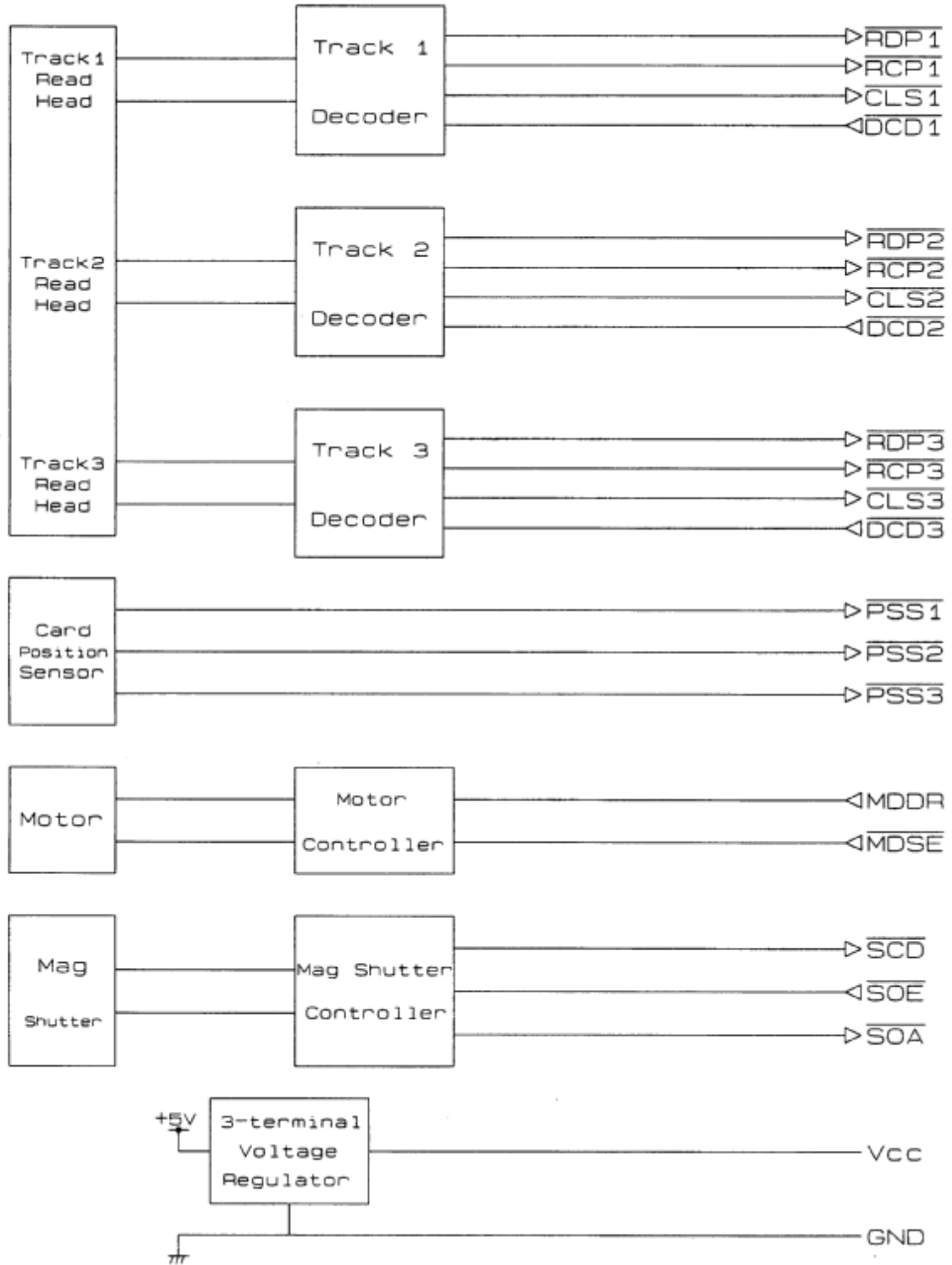
h) /SCD: Shutter Card Detected

Signal	Data	
	Detected	Nothing
/SCD	L	H

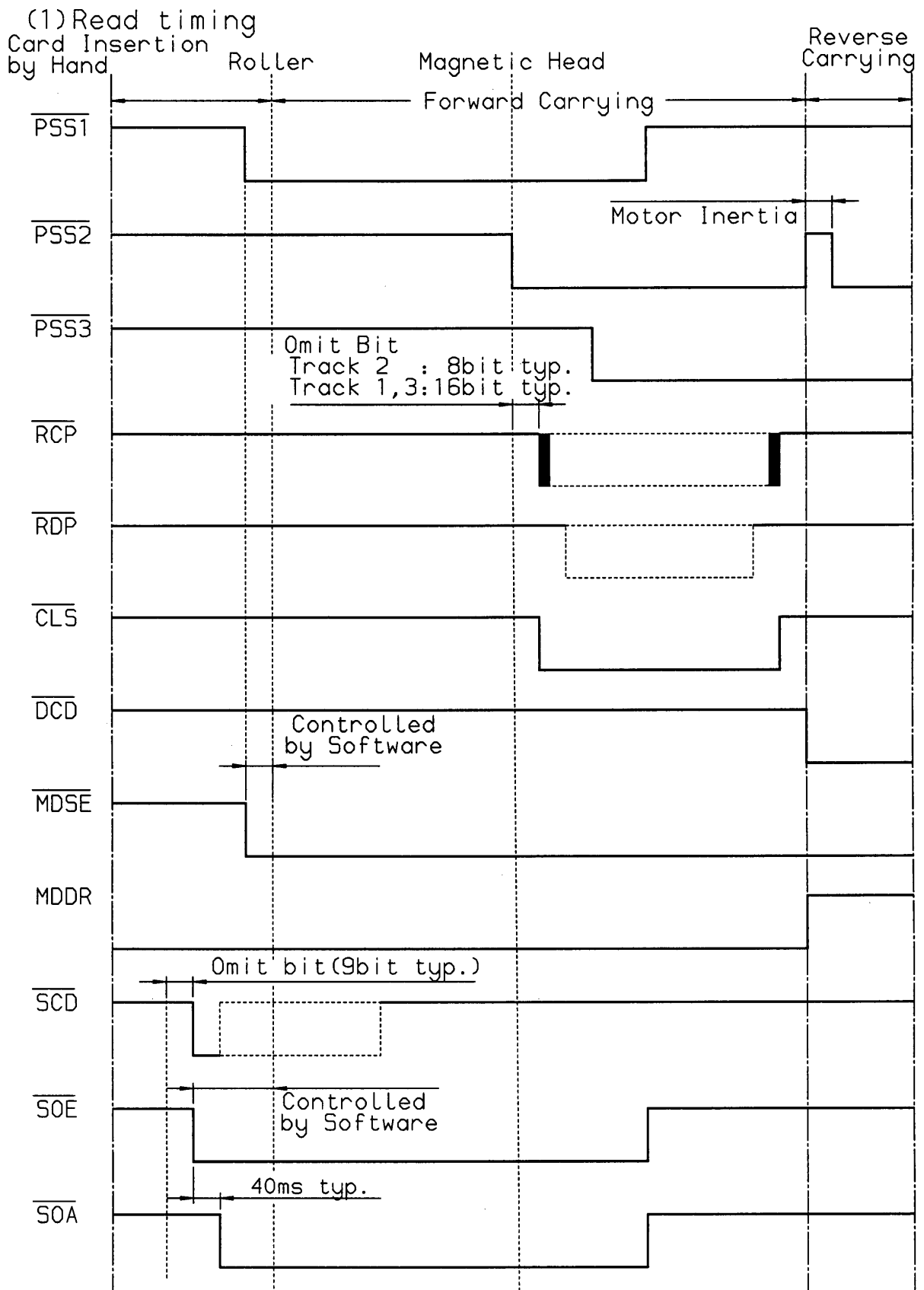
i) /SOE: Shutter Open Enable

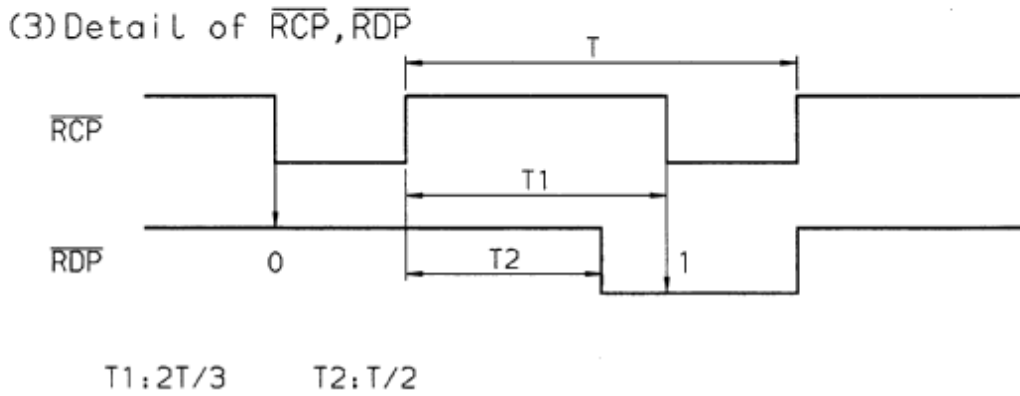
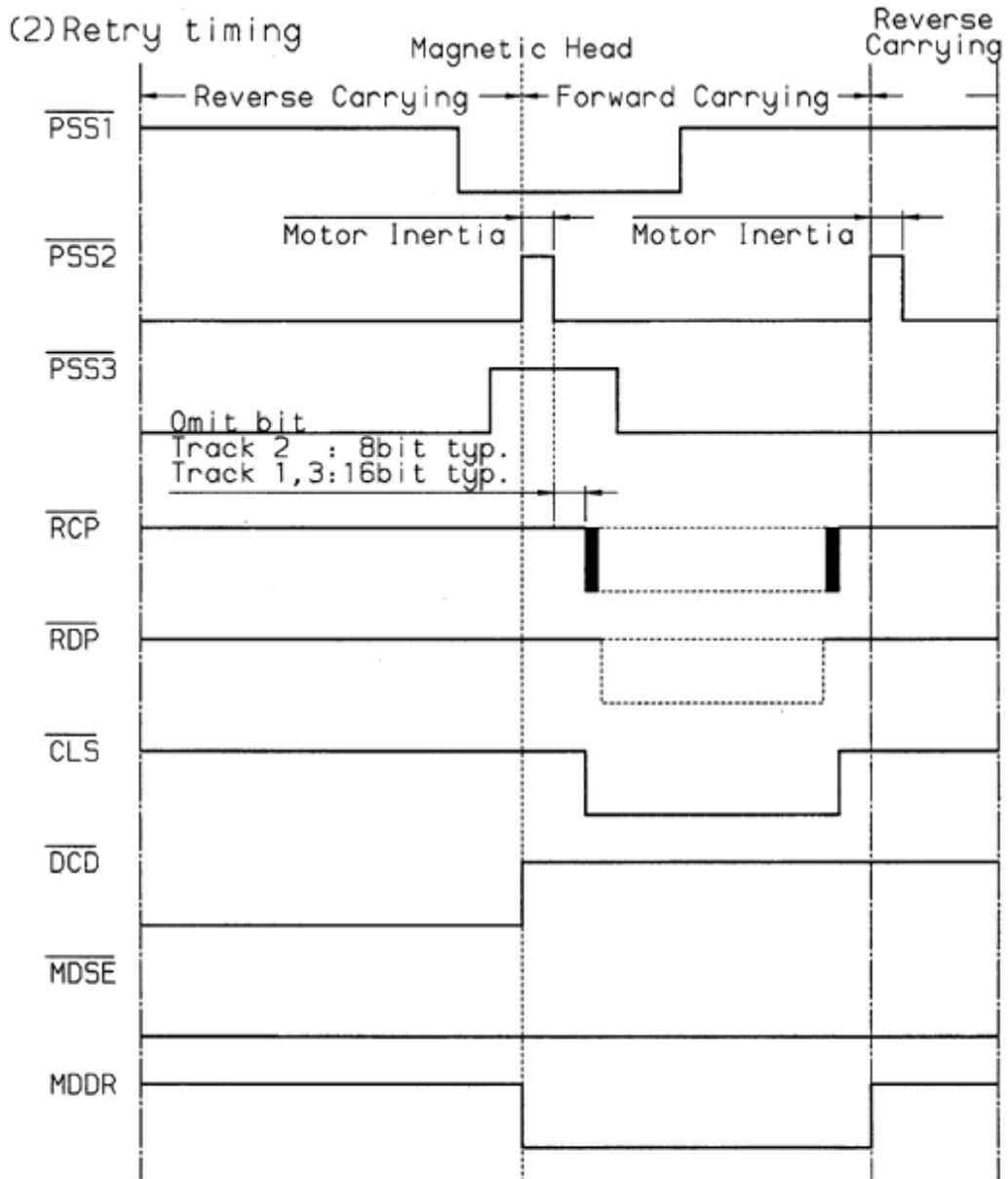
Signal	Shutter	
	Open	Close
/SOE	L	H

**16 BLOCK DIAGRAM**

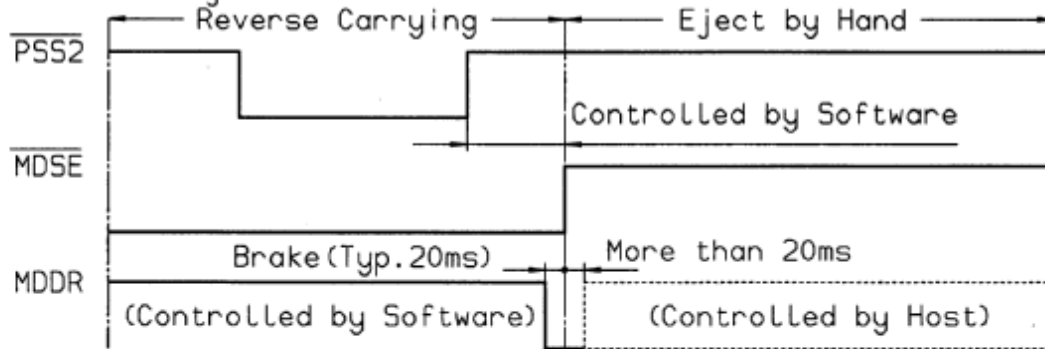


### 17 SIGNAL TIMING CHART

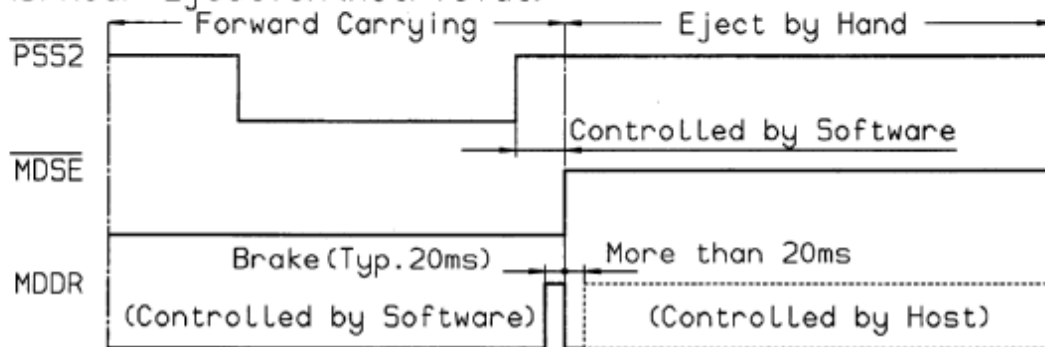




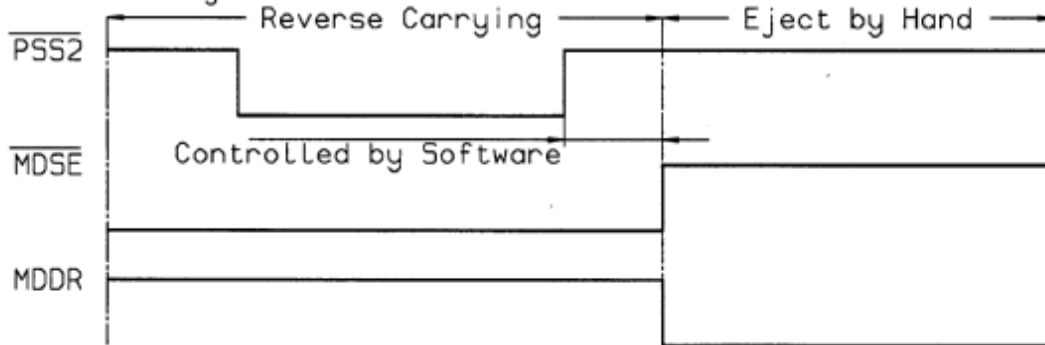
(4) Front Ejection (Retrieval)



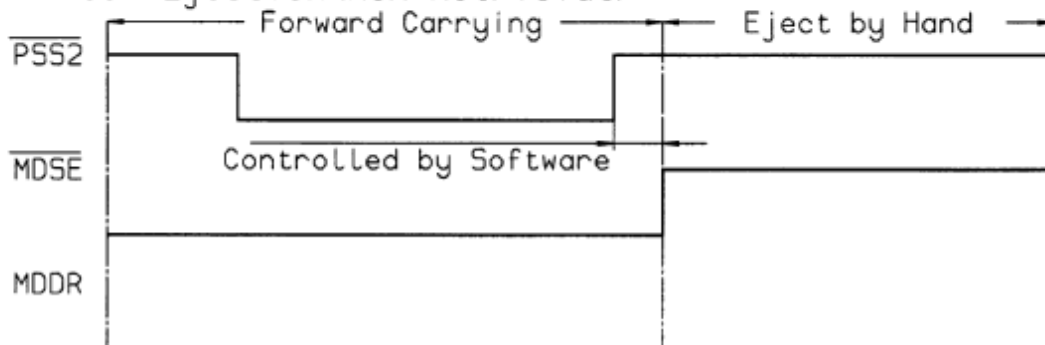
(5) Rear Ejection (Retrieval)



(6) Front Ejection (Non-Retrieval)



(7) Rear Ejection (Non-Retrieval)



## **18 CLEANING**

### **18-1** Cleaning period and parts

- (1) For the first time, After a long interval since last use  
Head, Rubber roller
- (2) Everyday before starting  
Head, Rubber roller
- (3) In every 1,000 passes  
Head, Rubber roller
- (4) Having errors frequently  
Head, Rubber roller

### **18-2** Method of cleaning

- (1) Usual
  - a) Head : Pass a cleaning card fully involved cleaning solvent several times.
  - b) Rubber roller : In a condition of a cleaning card stand in each rubber roller point, rotate rubber rollers for about 5 to 10 s.
- (2) Having errors frequently
  - a) Head : Like the Usual.
  - b) Rubber roller : Rotate a rubber roller with wiping by a cloth contained cleaning solvent.

NOTE: There is no concern with the resonance noise of the gear.

### **18-3** Recommended cleaning card

Parts No. : MCD-15-33-1

### **18-4** Cleaning solvent

Iso Propyl Alcohol (recommended by NEURON)

### **18-5** NOTE

Allow 1 min after cleaning for operating.

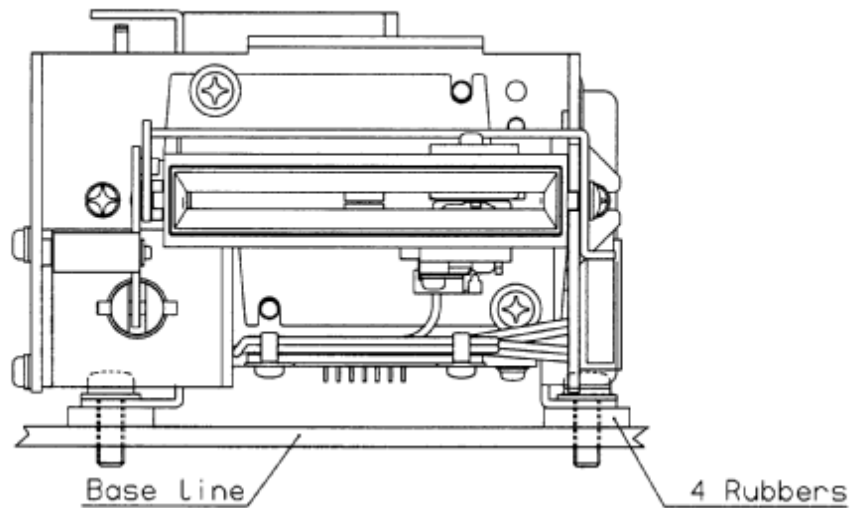
## **19 CAUTION OF PARTS OVERHEAT**

While the reader rotates the motor, if motor rotation is forcibly restrained, extend over probably parts will overheat.

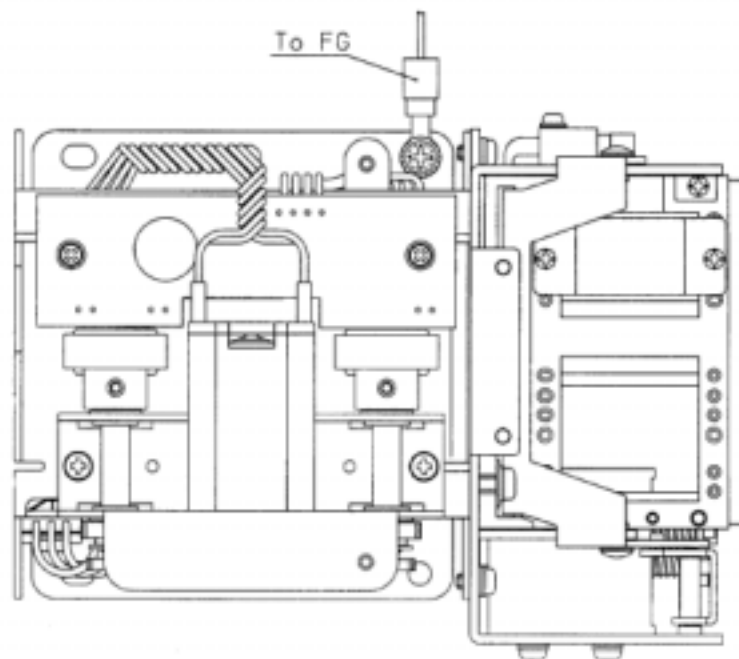
To prevent it, when signal of Motor Drive Start Enable : /MDSE is keeping continuously L level for a long time (more than 3 to 5 s) change /MDSE to H level forcibly.

## 20 INSTALLATION

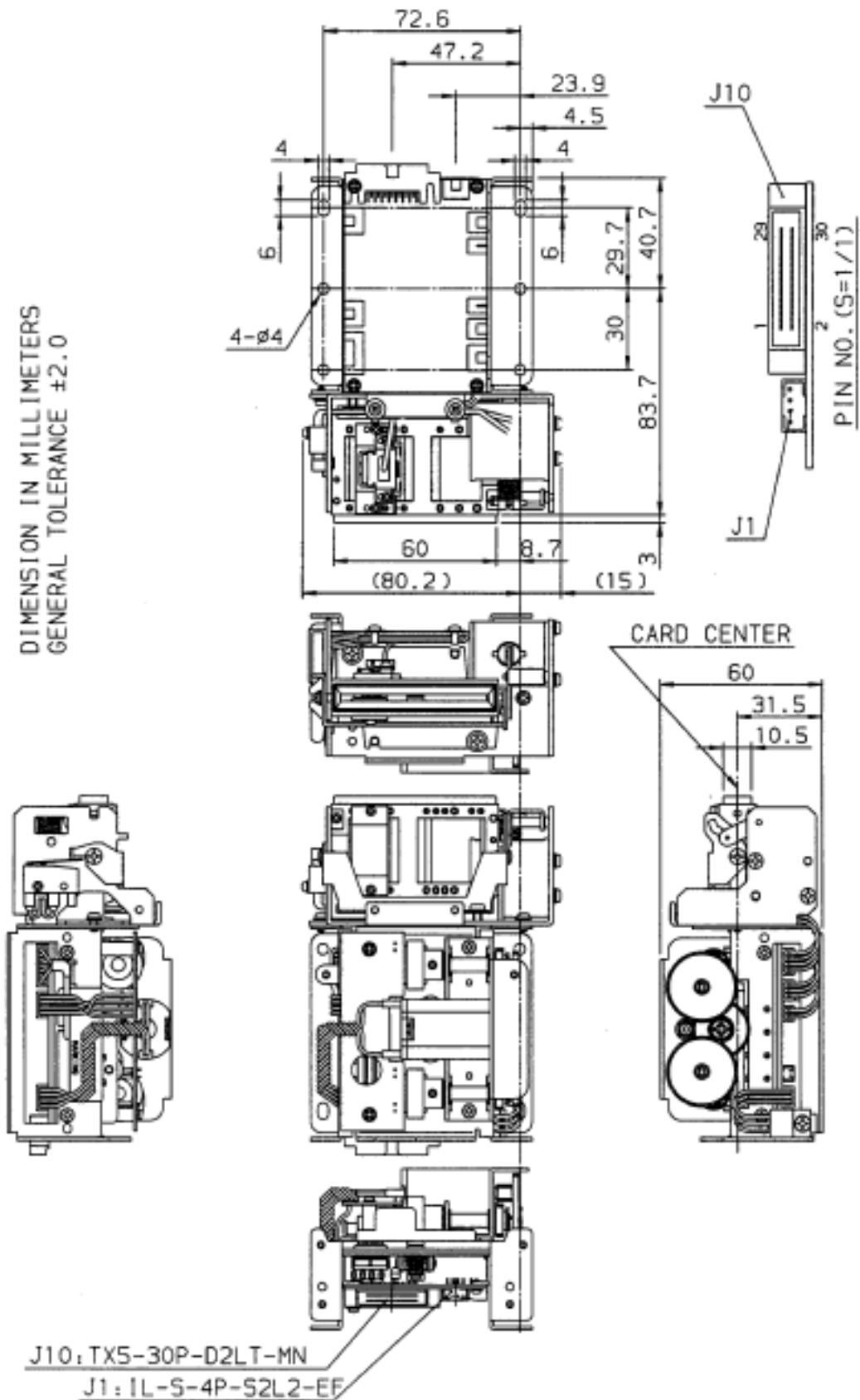
- a) Flatness of base plate must be 0.2mm or less.
- b) Attach rubber to prevent from stress.



- c) FG (Frame Ground) must be connected.



### 21 APPEARANCE



ED-0002

<u>Rev.No.</u>	<u>Date</u>	<u>Descriptions</u>	<u>NAME</u>
ED-0002-00	95-Jun.-08	1 <sup>st</sup> release(Tentative)	T.IZUMI
ED-0002-00a	95-Nov.-07	2 copies for NEI & Neuroscot misspelled and mischaracter insert Motor Drive Timing Chart	S.AKIYAMA
ED-0002-00b	96-Jan.-08	1 copy for Sales original page 2 insert 4 line : Ripple voltage, Rating current Peak current, Dielectric strength	S.AKIYAMA
ED-0002-01	96-Apl.-30	1 copy for Sales original	S.AKIYAMA
ED-0002-02	97-Jan.-27	change timing chart kill to 9.Motor Drive Timing chart p2 Rating current data change p2 insert shutter message p5,6 PDD cut	S.AKIYAMA
ED-0002-03	97-Aug.-05	1 copy for NJ Sales original change office address change 1.GENERAL (add ISO 7811 / 6) change timing chart (p7 Read timing) change 9.Dimensions	S.SUGIMOTO
ED-0002-04	99-Mar.-03	1 copy for NJ Sales original change all	S.SUGIMOTO
ED-0002-05	00-Aug.-24	1 copy for NJ Sales division's original SI Units change all	M.NOKARIYA