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General Description

Thanks so much for you our manual.We are a professional factory dedicated to manufacture of linear scale(Hereinafter referred to as scale) and digital display.There are a few types of the linear scale for meet the requirements in different applications, and the details as follows:

FTN is a standard scale with wide applications.The travel length is 70-1020mm.

FTL is a specifically designed for large machine tool,and its travel is 1000-3000 mm.

FTS is a slim linear scale for the machine tool which has a low installation size and small operation space, and its travel length is 70-670mm.

FTE is a supper slim scale and its dimension is small than FTS5-. It can use on many small machine. The travel length is 70-520mm.

1. The basic technical parameter of the encoder

1.1 Scaling distance: 0.02 mm (50lines /mm)
1.2 Resolution: 5 μm, 1 μm, 0.5 μm
1.3 Precision: ±3 μm, ±5 μm, ±15 μm/m (20±0.1℃)
1.4 Measuring range: 50~3000mm
1.5 Moving speed: 60m/min
1.6 Power supply: +5V±5%、80mA (12V,24V available)
1.7 Cable length: Standard 3m (Longer length available)
1.8 Working Temperature: 0~45℃
1.9 Pin Description: 9DB
1.10 Output signal: TTL or RS-422 signal Output (as follows)

TTL signal

Pin	1	2	3	4	5	6	7	8	9
Signal	Empty	0V	Empty	Empty	Empty	A	5V	B	Z
Color		Black				Green	Red	White	Orange

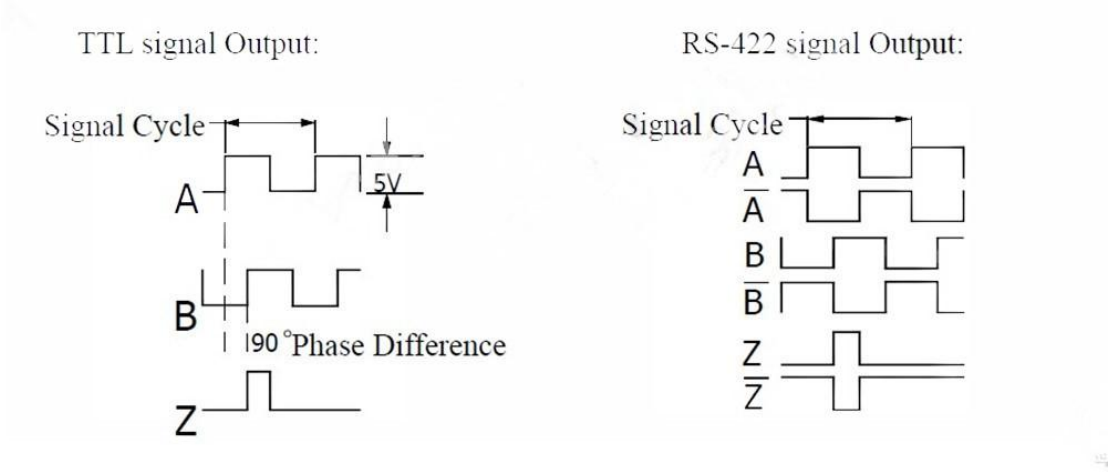
It need to customize if request Z signal.

RS-422 signal

Pin	1	2	3	4	5	6	7	8	9
Signal	A	0V	B	Empty	Z	A-	5V	B-	Z-
Color	Ink Green	Black	Ink Orange		Ink White	Green	Red	White	Orange

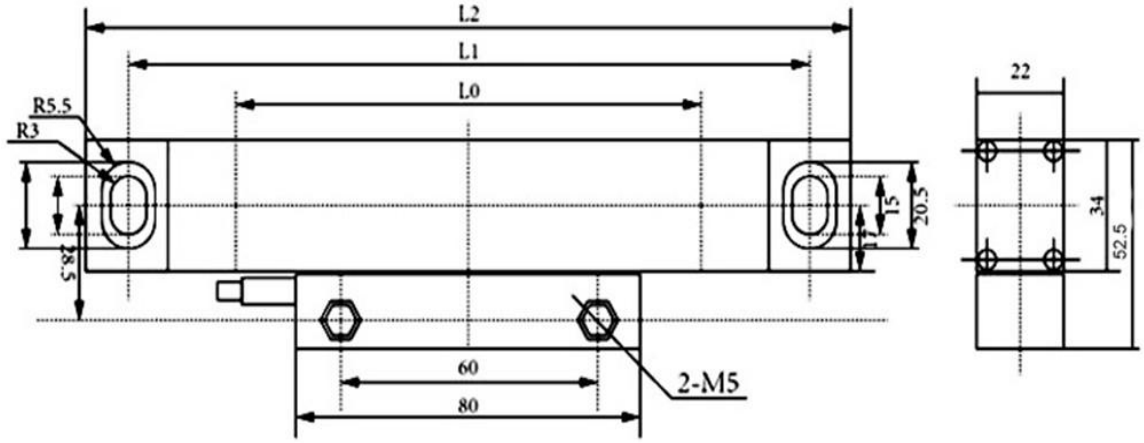
It need to customized if request Z Z- signal.

Signal wave:



2. Dimension of the Encoder.

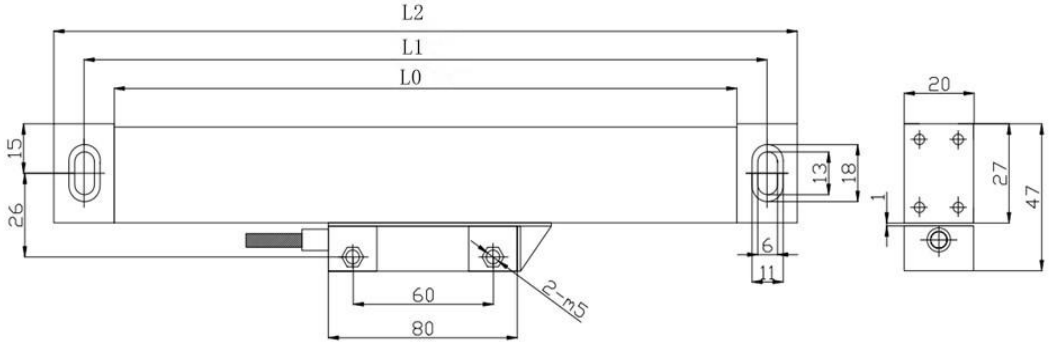
2.1 FTN5- series: unit:mm



Model	L0	L1	L2	Model	L0	L1	L2
FTN5-70	70	174	190	FTN5-120	120	224	240
FTN5-170	170	274	290	FTN5-220	220	324	340
FTN5-270	270	374	390	FTN5-320	320	424	440
FTN5-370	370	474	490	FTN5-420	420	524	540
FTN5-470	470	574	590	FTN5-520	520	624	640
FTN5-570	570	674	690	FTN5-620	620	724	740
FTN5-670	670	774	790	FTN5-720	720	824	840
FTN5-770	770	874	890	FTN5-820	820	924	940
FTN5-870	870	974	990	FTN5-920	920	1024	1040
FTN5-970	970	1074	1090	FTN5-1020	1020	1124	1140

L0:Effective measuring length of scale L1:Mounting hole to hole length of scale
L2: Overlength of scale

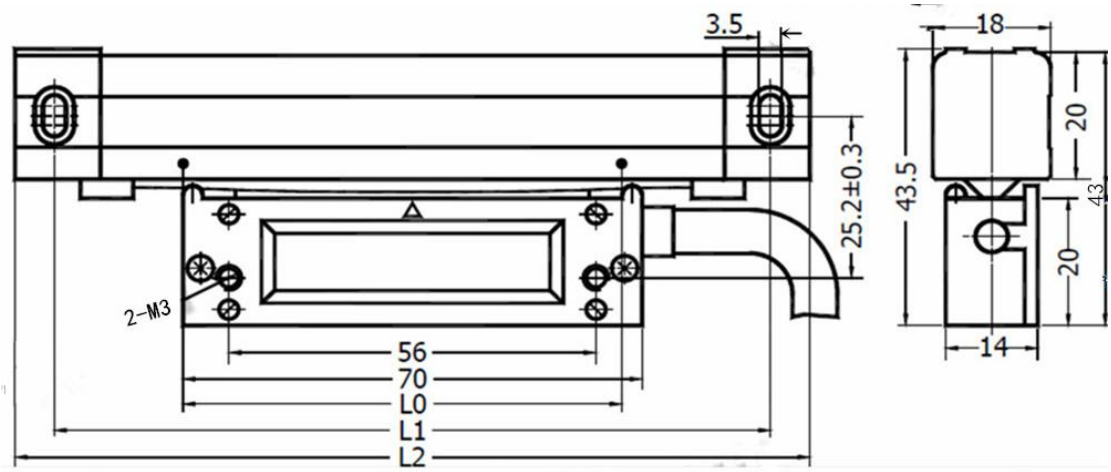
2.2 FTS5- series: unit:mm



Model	L0	L1	L2	Model	L0	L1	L2
FTS5-70	70	174	190	FTS5-120	120	224	240
FTS5-170	170	274	290	FTS5-220	220	324	340
FTS5-270	270	374	390	FTS5-320	320	424	440
FTS5-370	370	474	490	FTS5-420	420	524	540
FTS5-470	470	574	590	FTS5-520	520	624	640
FTS5-570	570	674	690	FTS5-620	620	724	740

L0:Effective measuring length of scale L1:Mounting hole to hole length of scale
L2: Overlength of scale

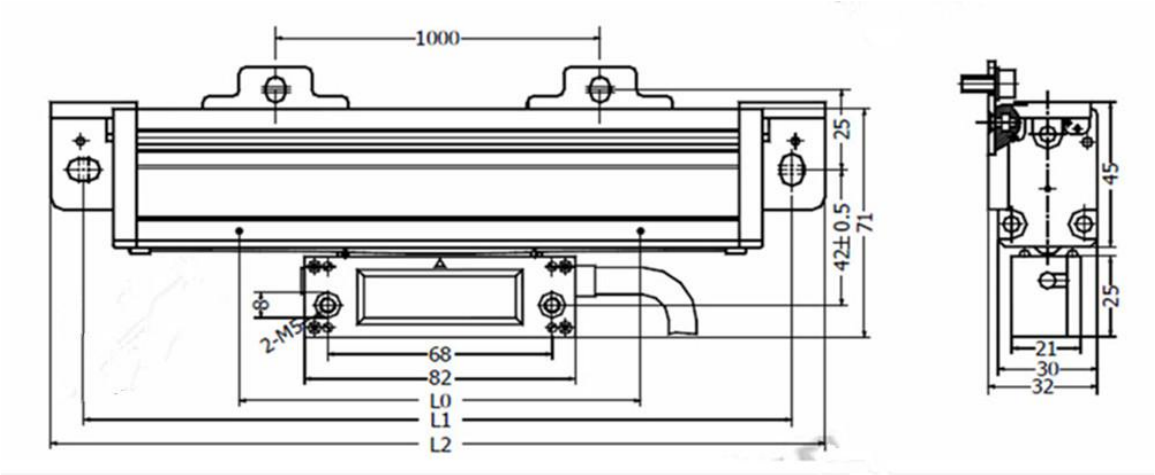
2.3 FTE5- series: unit:mm



Model	L0	L1	L2	Model	L0	L1	L2
FTE5-70	70	172	182	FTE5-120	120	222	232
NTS-170	170	272	282	FTE5-220	220	322	332
FTE5-270	270	372	382	FTE5-320	320	422	432
FTE5-370	370	472	482	FTE5-420	420	522	532
FTE5-470	470	572	582	FTE5-520	520	622	632

L0:Effective measuring length of scale L1:Mounting hole to hole length of scale
L2: Overlength of scale

2.4 FTL5- series:



Model	L0	L1	L2	Model	L0	L1	L2
FTL5-1100	1100	1250	1170	FTL5-1200	1200	1350	1370
FTL5-1300	1300	1450	1470	FTL5-1400	1400	1550	1570
FTL5-1500	1500	1650	1670	FTL5-1600	1600	1750	1770
FTL5-1700	1700	1850	1870	FTL5-1800	1800	1950	1970
FTL5-1900	1900	2050	2070	FTL5-2000	2000	2150	2170
FTL5-2100	2100	2250	2270	FTL5-2200	2200	2350	2370
FTL5-2300	2300	2450	2470	FTL5-2400	2400	2550	2570
FTL5-2500	2500	2650	2670	FTL5-2600	2600	2750	2770
FTL5-2700	2700	2850	2870	FTL5-2800	2800	2950	2970
FTL5-2900	2900	3050	3070	FTL5-3000	3000	3150	3170

L0:Effective measuring length of scale L1:Mounting hole to hole length of scale
L2: Overlength of scale

Note: Select the measuring range of scale according to the travel of machine tool. The measuring range of scale must be higher than the maximum travel of the machine tool.

3. Principle of Installation:

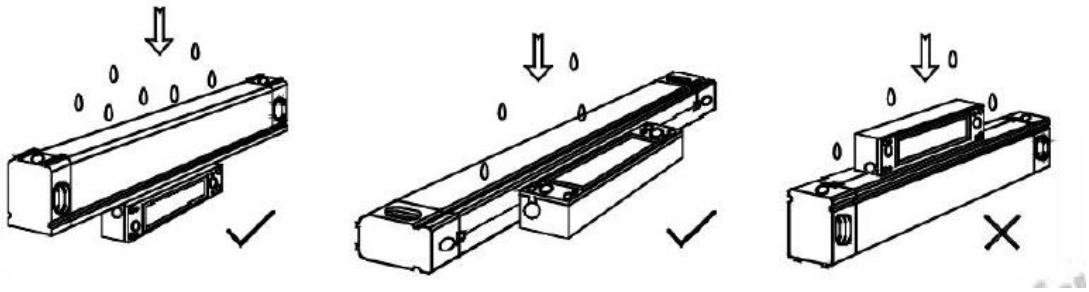
3.1.It must remove the plastic at the reader head before installation, as the plastic is only for protection the reader head during transport.

3.2.The scale must be installed with the guide rail of machine tool as the benchmark and be kept in parallel. The center of scale measuring range must be positioned on the center of travel of machine tool. Ensure that the actual measuring range of scale is higher than the maximum travel of machine tool.

3.3 The installation shall be based on priority principle as such that the scale shall be installed close to the drive screw of machine tool. After installation, the body of scale moves with the work bench, while the reading head is fixed on the machine tool.

3.4 The scale shall be so installed that it will not obstacle the operation or reduce the function of machine tool.

3.5 After installation, the scale shall be kept from knock. During machining, it shall not obstacle the handle of machine tool or affect the brake or other protrusions. It is not easy to contact when a work piece drops.
3.6 The scale shall be vertically installed, as shown in follow photo. But wherever impermissible, horizontal installation is also acceptable. Never install the encoder upside down (that is, reading head on top and scale body at lower). Never direct the rubber seal of scale toward the outlet of cooling oil from machine tool.



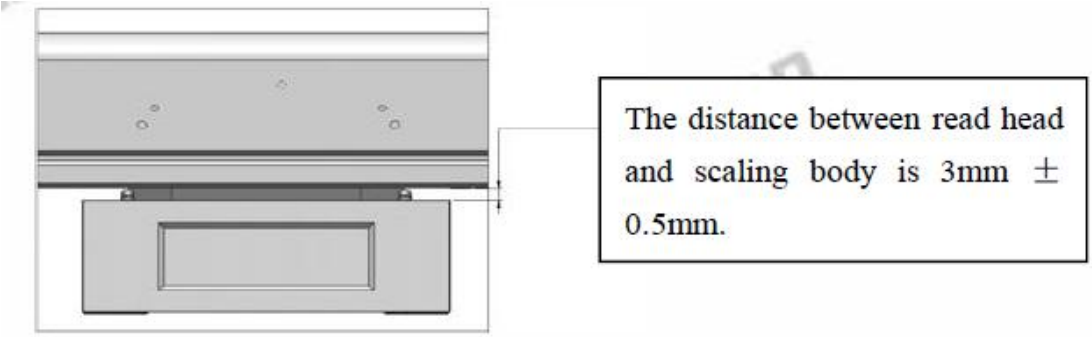
3.7 The scale enclosure shall be securely earthed to ensure the signal integrity.
3.8 The parallelism and verticality between scale and guide rail of machine tool shall be within 0.10 mm/m.

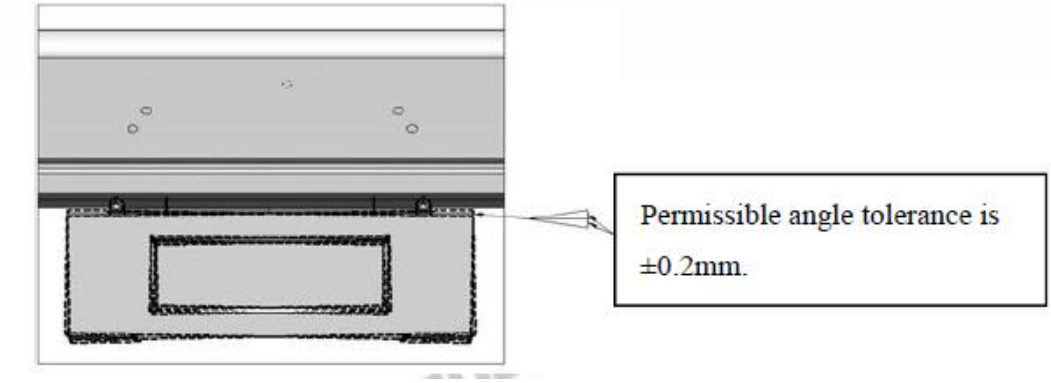
4.Installation of Reading Head

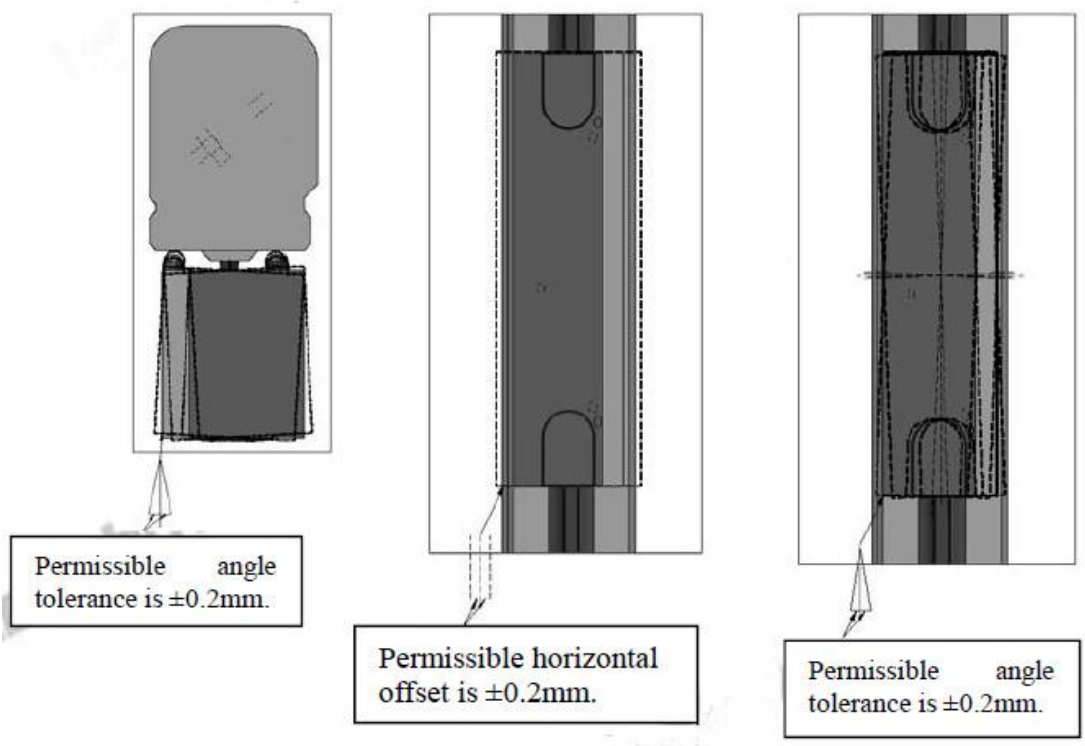
The reading head may be positively or reversely installed on the machined or non-machined plane. Generally, positive installation is used. The reverse installation is used only when the installation space is not enough and it is not easy to install positively.

5. Acceptance Rules

5.1 The connection of reading head shall have adequate rigidity. Shaking with force and observing the numerical display, the value shown on it will have some deviation. If releasing your hand, the value on numerical display shall be able to resume to original value.
5.2 The reading head shall located at the center of encoder, so that the sealing strip may close or open symmetrically, as shown.
5.3 The connecting plate may guarantee the position of reading head in encoder center and its relative position to scalebody.
5.4 The position of reading head relative to scaleand its mounting dimension are as follow:


The distance between read head and scaling body is 3mm ± 0.5mm.


Permissible angle tolerance is ±0.2mm.


Permissible angle tolerance is ±0.2mm.
Permissible horizontal offset is ±0.2mm.
Permissible angle tolerance is ±0.2mm.