

TST FDSYS.P™

FOR

PORTABLE WIRE ROPE INSPECTION



TST FLAW DETECTION TECHNOLOGY CO.,LTD.

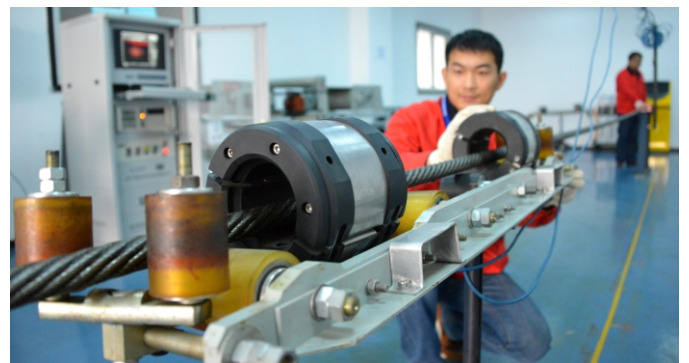


ABOUT US



TST Flaw Detection Technology Co., LTD (TST) incorporated in 2010 is specialized in designing, manufacturing and marketing the flaw detection systems for wire ropes and rope core conveyor belts. TST's mission is to continually develop flaw detection solutions for the safest wire rope operation and the most cost-efficient business outcome for wire rope and steel-cord conveyor belt users. With years of experience in the fields, TST realizes that the company's responsibility is not just a technical answer to safety inspection but a comprehensive business solution with full regards of people and environment, which means that our system must firstly be the keeper of the safe wire rope operations, furthermore our solution should be the enhancer for the business achievements and prosperity.

In the catalog of TST-FDSys™(Flaw Detection System) and TST-FDSol™(Flaw Detection Solution), we are providing a wide range of solutions that can be applied to different industries and diverse wire rope and steel-cord conveyor belt operating scenes. The applications include open-pit mine conveyor-belts, underground conveyor belts, underground mine hoisters, port cranes, construction cranes, residential and commercial elevators, cableways and etc. TST-FDSys™ and TST-FDSol™ can be installed in the forms of portable, realtime wire-rope, realtime conveyor-belt, real-time elevator or customized detecting systems for specific tasks. The commitment of TST Team is to find solutions for more efficient and safer wire rope operations, and materialize real economic benefits from the improvement of safety management.



INTRODUCTION



System Description

TST FDSys.P Flaw Detection System is developed on basis of magnetic inductive sensing technology and MFL(magnetic flux leakage) wire rope inspection technique. The system can be applied for the portable inspection of steel wire ropes and steel pipes for the physical damages or material deteriorations.

TS-X1124\X1142\X1160\X1180T are the 4 standard models in the portable series for the inspection of steel wire ropes with diameters of 6mm-70mm.

Customized models can be developed based on specific applications of the clients, such as for extra wide wire ropes up to 120mm, and for environments that require Intrinsic Safe and Explosion Proof design.

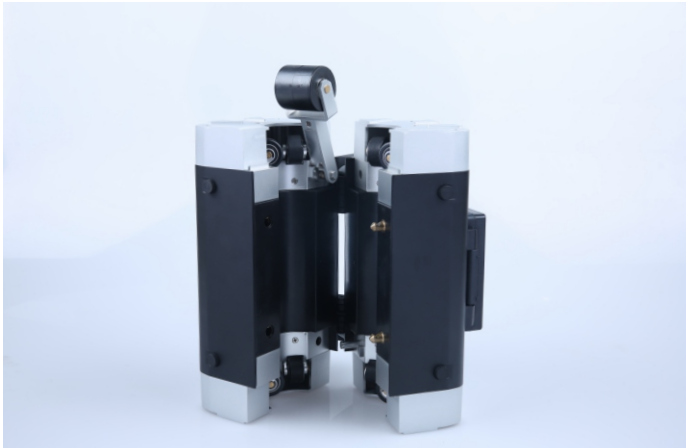


Model TS-X1180T



Customized Model for Extra Wide Wire Rope

SYSTEM FEATURES



General

Nondestructive inspection of wire rope with diameter from 6-83mm

Detection powered by TST sensor array

Portable detection of various flaw types including broken wire, corrosion, pitting, abrasion, fatigue etc. for which a magnetic signature will be left due to the occurrence of a flaw event.

Instant monitoring and evaluation of inspection process with portable 'Control Panel' and 'Screen'

Data processing with built-in signal processor for portable application

Evaluating and reporting with built-in and PC software set for portable application

Inspection Speed

< 15 m/s (or as limited for safe operation)

Defect Types

LF(Local Fault) LMA(Loss of Metallic Area)

Physical Damages: Broken wire, Abrasion, Structure Deformation

Material Deteriorations: Corrosion, Fatigue

Flaw Detection

Qualitative Flaw Detection

Quantitative Flaw Detection

High Repeatability

High Accuracy

Waveform Inspection Diagram Output

Statistical Inspection Result Table Output


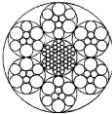
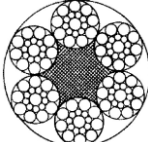
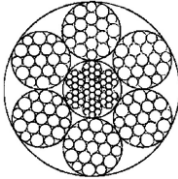
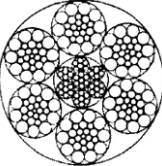
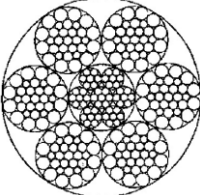
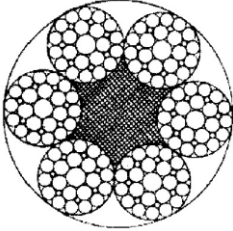
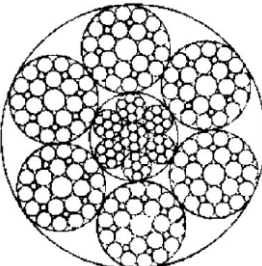
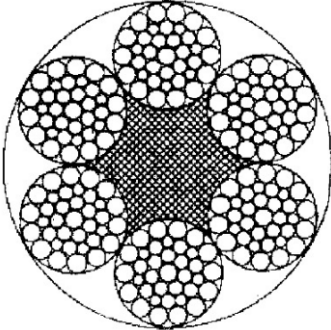
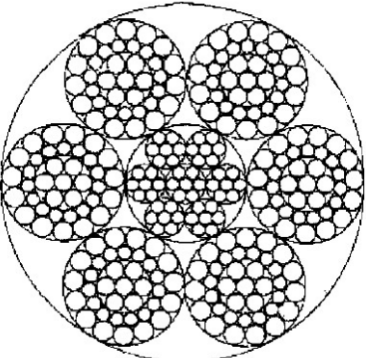
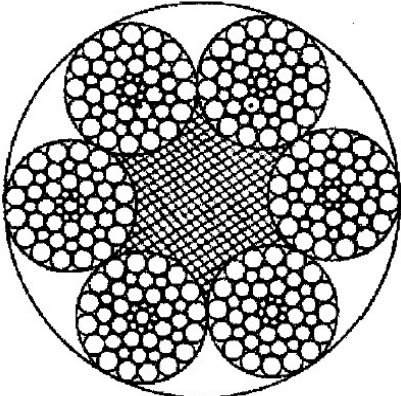
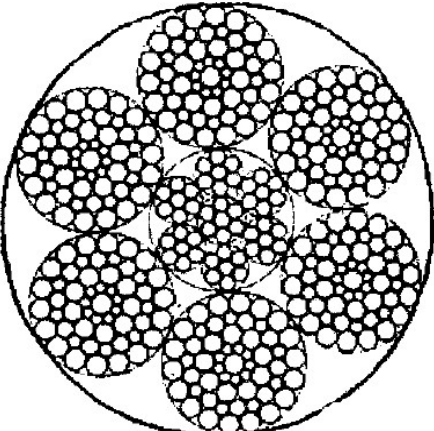


SYSTEM FEATURES

M-Regulator Field Strength	< 50mT	Sensor Dissipation Power	<50mW
Continual Detection Capacity	>10 ⁴ m	Sensing Range	0-30mm
Detection Response Time	≤0.5ms	Sensor Lifetime	>27 *10 ⁴ hours
E/M Sensitivity	≥1.0V/mT	S/N Ratio	S/N>85dB
Working Temperature	-20-50 °C	Relative Humidity	<95%
Storage Temperature	-40-60 °C	Cleaning	Volatile organic solvent (ABS safe, Insulation safe, Non-toxic, Non-conductive)
Charge Time:	4-5 hours	Service Time:	>8 hours



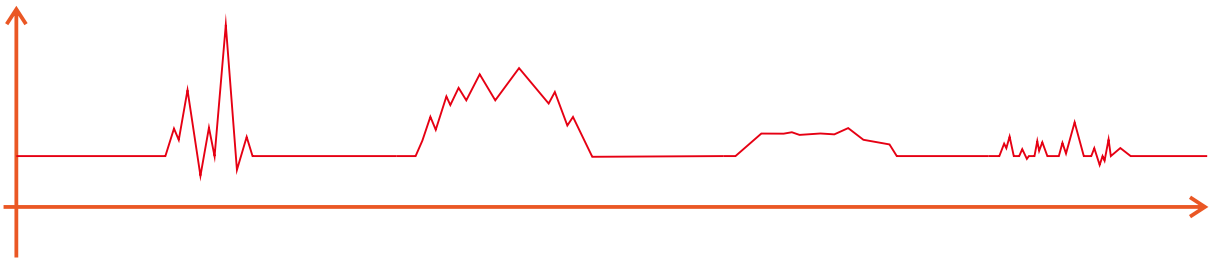
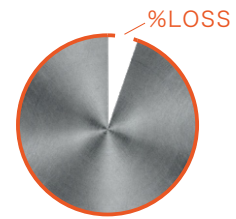
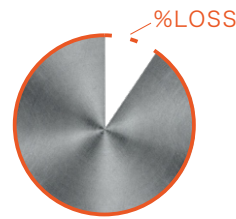
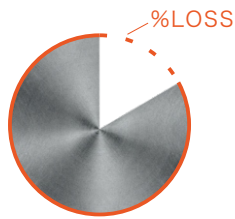
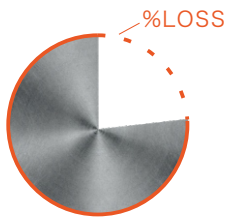
PRODUCT SPECIFICATIONS

MODEL	ROPE DIAMETER SPECS	SAMPLE REMARK			
TS-X1124	ϕ 6mm - 24mm	 6×7+FC ϕ 8	 6×9W+IWR ϕ 15	 6×19S+FC ϕ 20	 6×19W+IWR ϕ 24
TS-X1142	ϕ 22mm - 42mm	 6×26WS+IWR ϕ 25	 6×31WS+IWR ϕ 30	 6×29Fi+FC ϕ 35	 6×29Fi+IWR ϕ 40
TS-X1160	ϕ 40mm - 60mm	 6×36WS+FC ϕ 45		 6×37S+IWR ϕ 50	
TS-X1180T	ϕ 60mm - 70mm	 6×49SWS+FC ϕ 55		 6×55SWS+IWR ϕ 60	

SYSTEM PERFORMANCE



— Broken Wire — Fatigue — Abrasion — Corrosion

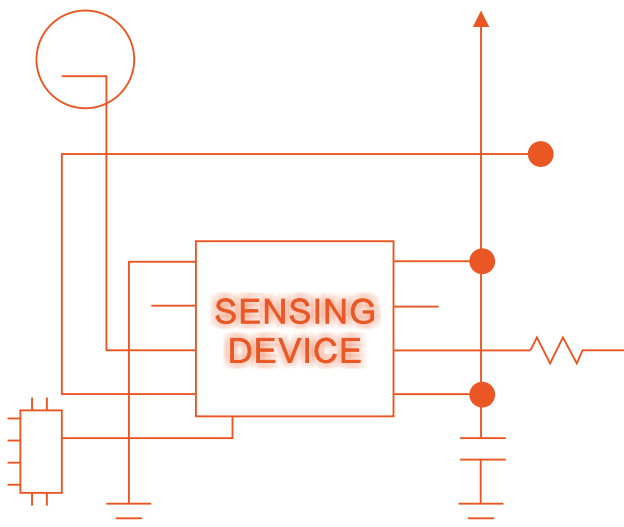


Qualitative Inspection

FDSys.P is able to inspect the wire rope and determine the defect types, such as Local Fault(LF) or Loss of Matallic Area (LMA).

Quantitative Inspection

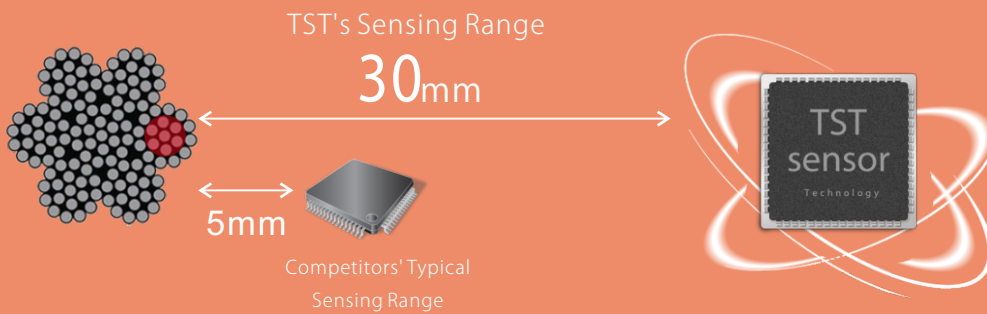
FDSys.P is able to inspect the wire rope and determine the respective defect values and severity with respect to the % loss of cross sectional metallic area and output in the statistical table with % values and positions.



Reliable Inspection

With the advanced sensor technology, FDSys.P is able to detect the defects with high repeatability and accuracy

SYSTEM PERFORMANCE

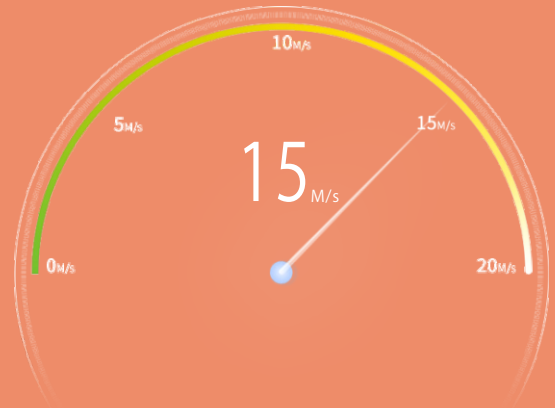


Wide Range Inspection

Due to the optimization of sensor array, the sensor of FDSys.P is able to pick up signals at wide range from the target and inspect the wire rope without interfering the relative movement between rope and device so that good passing ability is achieved. Work efficiency and operation safety is assured.

High Speed Inspection

FDSys.P is able to inspect the wire rope at a high speed without compromising the inspection performance and result.

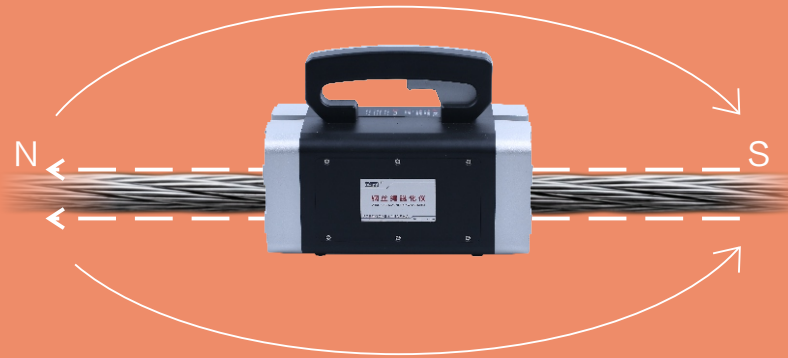


Intelligent Inspection

FDSys.P is integrated with intelligent data analysis and processing algorithm on a user-friendly operating interface to provide a unmatched inspection experience and solution.

INSPECTION PROCESS

1



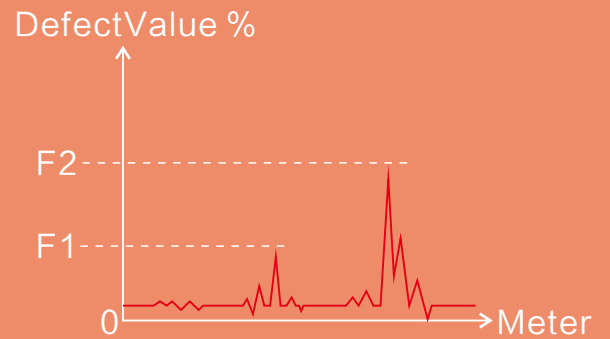
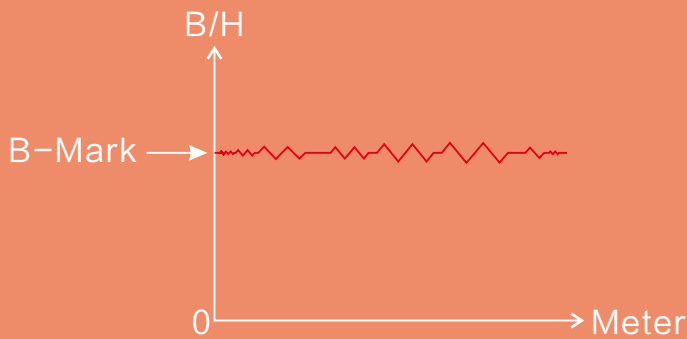
Field Regulating (Magnetizing)

2



BENCHMARKING

INSPECTING



INSPECTION PROCESS

3

Flaw Detection Result Sheet

View Result: [Flaw Detection Result Sheet] Rope No.: [1] Task No.: [1]
 Task Date: 2023-1-20 Meqtr Date: 2023-1-20 Inspection Length: 143.5m Benchmark: 230 Rope Specs: 06*19-28.0 Ref Length: 0
 Viewers Range: 143.5m Signal Factor: 2000 Total Flow Count: 219 Utilized Value: 10%

Severity Rank	Flow Value %	Flow Position m
1	13.39	24.20
2	5.94	24.00
3	5.18	3.85

Item No.	Flow Position(m)	Flow Value(%)	Flow Class	UFS Equivalent (mV-c)	LMA Equivalent (mm)
1	0.32	1.09	LFI	1	
2	0.65	0.79	LMA		0.11
3	2.15	1.34	LFI	2	
4	2.21	0.88	LMA		0.12
5	2.24	0.85	LMA		0.12
6	2.88	1.12	LFI	1	
7	2.76	0.94	LMA		0.13
8	2.84	0.95	LMA		0.12
9	3.36	0.76	LMA		0.11
10	3.65	1.15	LFI	1	
11	3.94	1.15	LFI	1	
12	3.71	0.93	LMA		0.13
13	3.60	1.08	LFI	1	
14	5.11	0.88	LMA		0.12
15	5.15	0.76	LMA		0.11
16	5.25	0.88	LMA		0.12
17	5.32	1.14	LFI	1	
18	6.50	1.03	LFI	1	
19	6.85	1.32	LFI	2	
20	8.60	1.03	LFI	1	
21	8.07	0.96	LMA		0.13

Data Uploading & Analysis

4

TST FDsys.P for Portable Inspection of Steel Wire Rope

INSPECTION REPORT

Inspection Objective: Non-Destructive Inspection of Steel Wire Rope
Inspection Scheme: by Schedule(Day/Week/Month)
Inspection Device Model: 32-X1132
Device Serial Code: 0001
Inspection Site:

Inspector:
Auditor:

TST Statement of Using TST Systems

- TST FDsys Series are inspection systems designed and developed by TST Flaw Detection Technology Co., Ltd for the non-destructive inspection of steel wire ropes and steel cord conveyor belts.
- The inspection technique and inspection output of TST FDsys Systems comply with the recommended approach in ISO 3309 standard and ASTM E2311 standard for the non-destructive inspection of steel wire ropes.
- Inspection using TST FDsys Series to inspect steel wire ropes and steel cord conveyor belts must be properly trained by TST or TST certified agencies and receive "Certificate of Inspection" by TST.
- Technical Support and Diagnostic Service can only be provided by TST or TST certified agencies to inspection scenarios where TST certified inspectors have operated.
- TST certified inspectors are strongly recommended to obtain the knowledge of target operation and background information of the inspection target.
- Essential documentation of inspection tasks is strongly recommended for FDsys.P Models, e.g. Inspection Info Sheet, "Inspection Report".
- Inspector and Auditor using TST FDsys.P Models are responsible for making the inspection reports in which TST or TST Certified Agencies should provide essential technical support and expert opinion case by case.
- Any inspection result either from TST Systems or other NDT inspection approach is not supported to be the sole source of evidence to interpret complicated inspection scenarios. In cases where conflicts arise, further investigation should be required.
- If not proved to be system fault or system malfunction, TST should reserve the rights and responsibilities to interpret and justify the inspection data and result generated by TST Systems.
- Maintenance policy and discard criteria of inspection target should be acknowledged to TST or TST Certified Agencies to justify the compliance of TST reporting process thus to notify and interpret different results that may arise.
- TST does not take collateral responsibilities for the conducts of any Uncertified 3rd party inspection service vendor using TST FDsys Systems for business purpose.

INSPECTION SUMMARY REPORT

Inspection Scheme	Inspected Item/Location	Device Model	Page 1 of 1
Inspection Site	Device Serial Code	0001	TS-1132
Inspection Objective	Portable Non-destructive Inspection and Flow Classification of Steel Wire Rope		
Inspection Technical Reference	National Standard of PRC: GB/T8168-2008 ISO 3309:2019 ASTM E2311		
Item No.	06*19-28.0	Rope Diameter	22.0mm
Inspection Length	143.5m	Inspection Date	2023-01-20
Inspection Rate	10%	Inspection Result	302
Inspection Class	8.41%	28 Standard Flow Ranks	1,830
Inspection Level	4.52%	20 Standard Flow Ranks	1,260
Inspection Type	2.42%	14 Standard Flow Ranks	1,200
Inspection Unit	2.13%	16 Standard Flow Ranks	1,200
Inspection Result	3	Flow Classification	3

Inspection Summary Result: Flow Value %: 10.34% UFS Equivalent: 3.02mm LMA Equivalent: 0.13mm

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Flaw Severity Statistics

Severity Class	Flow Count (or Flow Total Length Count)	Statement
Level I	1	15% (6%) of Utilized
Level II	1	50% (40%) of Utilized
Level III	0	60% (40%) of Utilized
Level IV	1	80% (10%) of Utilized
Level V	0	Utilization Allowed

Inspection Summary Result: Flow Value %: 10.34% UFS Equivalent: 3.02mm LMA Equivalent: 0.13mm

Flaw Class Statistics

Flow Class	Flow Count	Flow Value of Class %	Flow Value Position m
LFI	1	1	1
LF2	1	1	1
LF3	1	1	1
LMA	1	1	1
UFS	3	8.41	1.82

Reference Flow Class Characteristics: None or general. There are no characteristics in a class. Level I and II are of general flow class. Level III and IV are of general flow class. Level V is of general flow class. Level VI is of general flow class. Level VII is of general flow class. Level VIII is of general flow class. Level IX is of general flow class. Level X is of general flow class. Level XI is of general flow class. Level XII is of general flow class. Level XIII is of general flow class. Level XIV is of general flow class. Level XV is of general flow class. Level XVI is of general flow class. Level XVII is of general flow class. Level XVIII is of general flow class. Level XIX is of general flow class. Level XX is of general flow class. Level XXI is of general flow class. Level XXII is of general flow class. Level XXIII is of general flow class. Level XXIV is of general flow class. Level XXV is of general flow class. Level XXVI is of general flow class. Level XXVII is of general flow class. Level XXVIII is of general flow class. Level XXIX is of general flow class. Level XXX is of general flow class.

Flaw Detection Result Sheet

Item No.	Flow Position (m)	Flow Value(%)	Flow Class	UFS Equivalent (mV-c)	LMA Equivalent (mm)
1	1.22	3.42	UFS	0.27	
2	1.64	6.51	UFS	0.35	
3	2.3	4.53	UFS	0.50	

Inspection report

FIELD APPLICATIONS





CONTACT US

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