

### Cables

Model No. SER.NO

MODEL.NO.

Shurinkage tube

Shurinkage tube

(0.05m)

(0.05m)

L ± 10%

L ± 10%

LW-□□□□-□□□□

Cable length(L)											Temperature range of cable		Connector type		Armor		
005	5m	055	55m	105	105m	155	155m	205	205m	255	255m	A	-40 to +80 °C	R	Angle type	0	Without
010	10m	060	60m	110	110m	160	160m	210	210m	260	260m	B	-40 to +125 °C	S	Straight type	1	With
015	15m	065	65m	115	115m	165	165m	215	215m	265	265m						
020	20m	070	70m	120	120m	170	170m	220	220m	270	270m						
025	25m	075	75m	125	125m	175	175m	225	225m	275	275m						
030	30m	080	80m	130	130m	180	180m	230	230m	280	280m						
035	35m	085	85m	135	135m	185	185m	235	235m	285	285m						
040	40m	090	90m	140	140m	190	190m	240	240m	290	290m						
045	45m	095	95m	145	145m	195	195m	245	245m	295	295m						
050	50m	100	100m	150	150m	200	200m	250	250m	300	300m						

MAX. length LW-□□□□A-□□ : 300m  
LW-□□□□B-□□ : 150m  
LW-□□□□□-1 : 15m

Standard

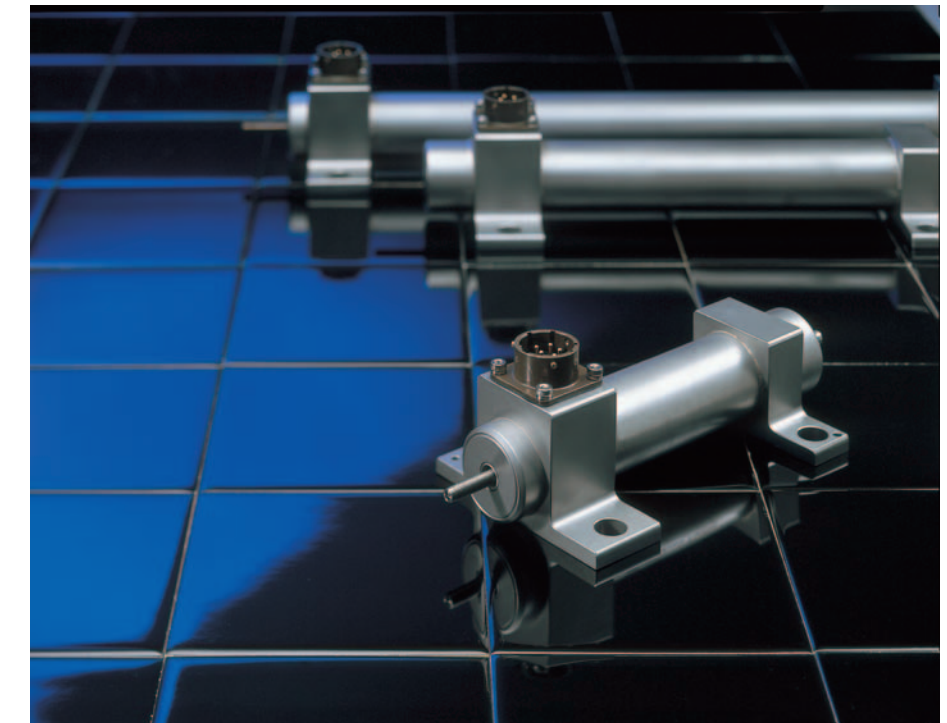
No.	NAME
1	Connector
2	Three-wire shielded cable
3	Solderless terminals

# LS series

## LVDT - Linear Variable Differential Transformer -

### Features

- Wide range of stroke
- High reliability, durability and accuracy
- 4 - 20 mA output is available (when using VM-11P)
- CSA / FM approvals  
(Non-incendive Class 1 Div.2 Group A,B,C,D)



Contact to

#### SHINKAWA Electric Co., Ltd.

3rd Fl. Shin-kojimachi Bldg.3-3 Kojimachi 4-chome, Chiyoda-ku, Tokyo 102-0083, Japan  
Phone : 81-3-3263-4411 Fax : 81-3-3262-2171  
WEB : <http://www.shinkawa.co.jp/>

#### SEC of America Inc.

6934 Beach Drive SW, Ste.4, Ocean Isle Beach, NC 28469-5797, USA  
Phone : 1-910-579-3220 Fax : 1-910-575-3238  
e-mail : [info@sec-america.com](mailto:info@sec-america.com)  
WEB : <http://www.sec-america.com>

#### SHINKAWA Sensor Technology, Inc.

4-22 Yoshikawa-kogyodanchi, Higashihiroshima 739-0153, Japan  
Phone : 81-82-429-1118 Fax : 81-82-429-0804  
WEB : <http://www.sst-shinkawa.co.jp>

\* Specifications, outline drawings and other written information can be changed without notice.

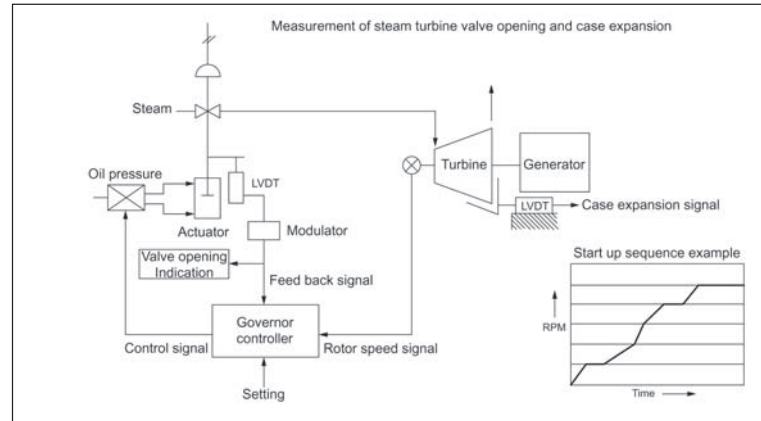
Published in Jan. 2009

# High Reliable Linear Transformer !

The LS Series LVDT is a highly reliable Linear Variable Differential Transformer which provides long-range measurement of turbine valve opening and casing expansion. It has a broad range of applications due to its durability and measuring accuracy.

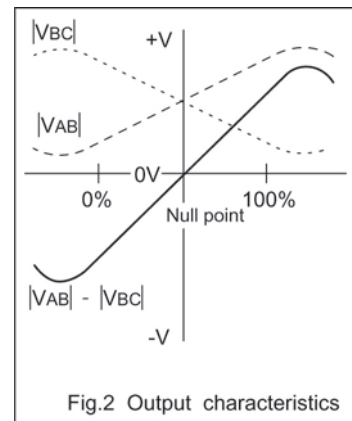
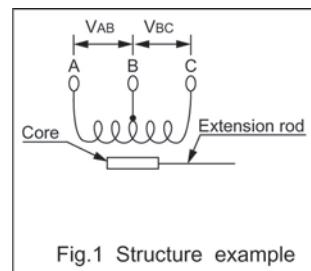
## Main applications

In the governor control of gas and steam turbines, the valve opening is adjusted so that the number of revolutions becomes constant while the load condition and number of revolutions are monitored. The LS series transducer measures the valve opening and is used to feedback the signal to the electronic governor.



## Principle of measurement

This is a displacement detector which measures relatively long displacements called LVDT (Linear Variable Differential Transformer). As shown in Fig.1, when an iron core moves within the wound coils, the impedances between A and B, and B and C change. Since these impedance changes are proportional to the movement of the iron core, a voltage proportional to the movement of the iron core can be generated by obtaining the difference between VAB and VBC when a constant voltage is applied between A and C. (Fig. 2)



## Specifications

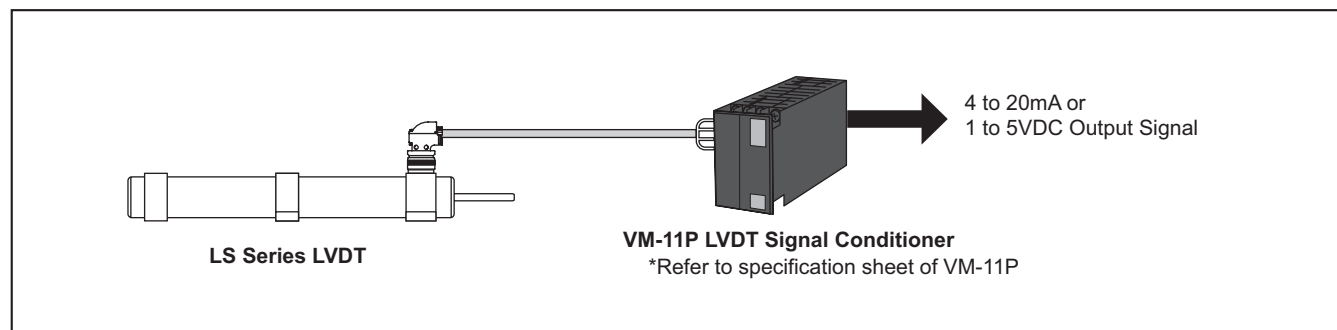
Stroke	50, 100, 150, 200, 250, 300, 350, 400, 450mm
Excitation	3kHz, 5 to 20Vrms
Coil Impedance	600Ω ±100Ω(3kHz)
Linearity	±0.2% of 100% stroke, ±1.5% of 110% stroke
Operating Temperature	-40 to +125 deg. C (-40 to +257 deg. F REF.)
Insulation Resistance	More than 10MΩ at 500VDC (between pins and case)
Dielectric Strength	500Vrms at 1min. (between pins and case)
Shock Vibration	490m/s <sup>2</sup> (50G REF.) at 2kHz
Standard Cable	3-cond.shielded cable with mating connector (5 m, 0.75mm <sup>2</sup> (AWG No.20))
Magnetically Shielding	Internal magnetically shielded

## CSA / FM Approvals

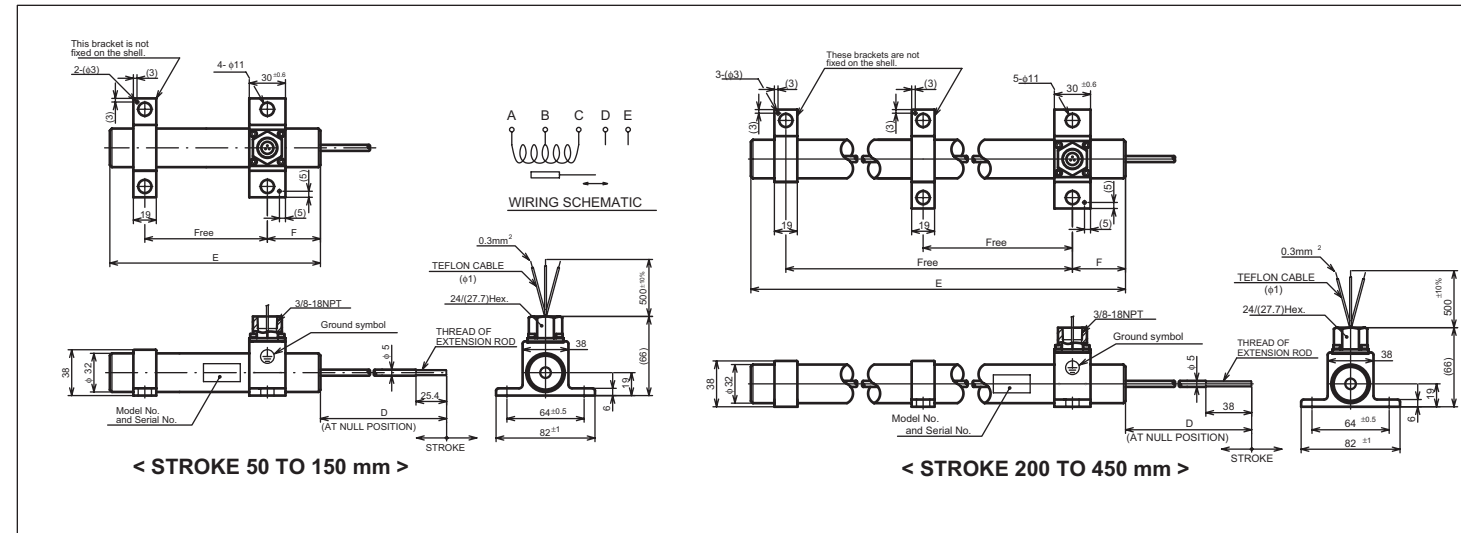
Lead wire type only non-incendive approvals



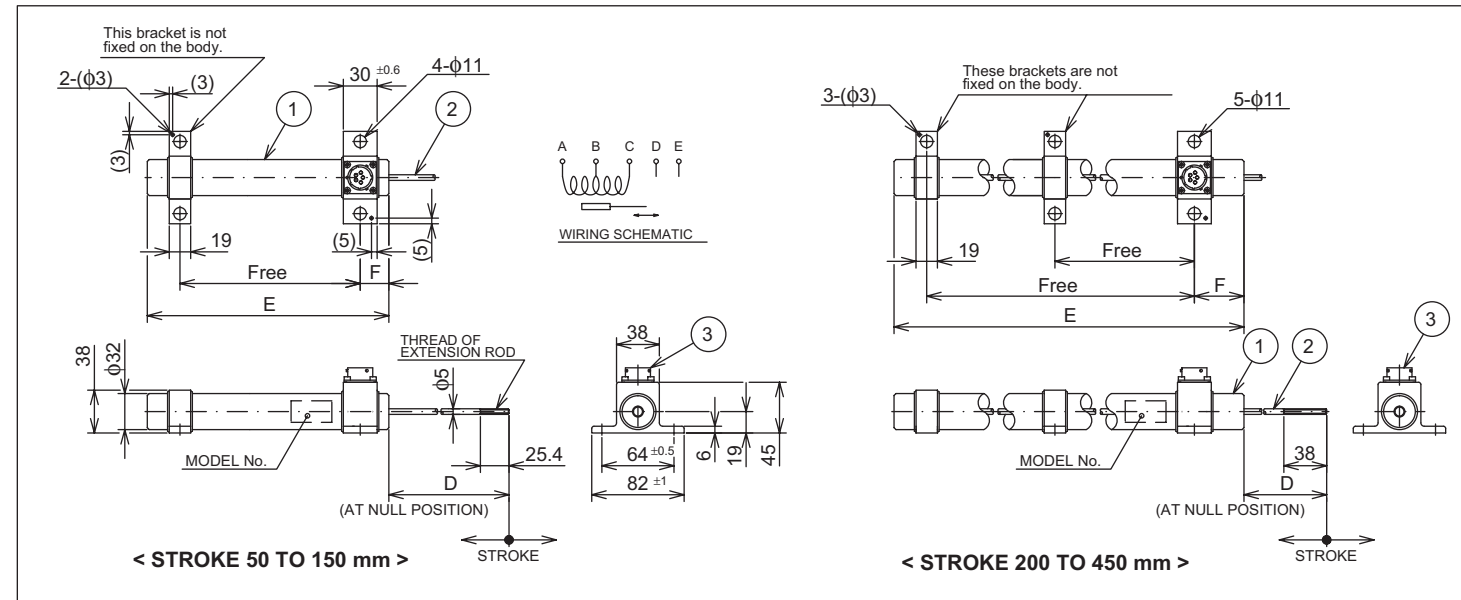
## System Configuration



## LS-L Lead Wire Type



## LS-C Connector Type



### < LS-L Lead Wire Type >

Stroke		Thread of extension rod		Non-incendive
050	50mm	M	M5x0.8	1 FM/CSA Class 1 Div.2 Group A, B, C, D
100	100mm	U	10-32UNF	
150	150mm			
200	200mm			
250	250mm			

### < LS-C Connector Type >

Stroke		Thread of extension rod		Movable bracket	CE marking
050	50mm	M	M5x0.8	1	
100	100mm	U	10-32UNF		
150	150mm				
200	200mm				
250	250mm				

MODEL	LS-050	LS-100	LS-150	LS-200	LS-250	LS-300	LS-350	LS-400	LS-450
STROKE	mm	50	100	150	200	250	300	350	450
	inches*	2'	4'	6'	8'	10'	12'	14'	18'
DIMENSION (mm)	D	63.5	89	114	140	165	206	232	282
	E	152.4	257	362	470	584	686	787	889
	F	25.4	25.4	25.4	38	38	44	44	44

\*STROKE(inches) IS APPROXIMATE VALUE REFERRED TO STROKE(mm).