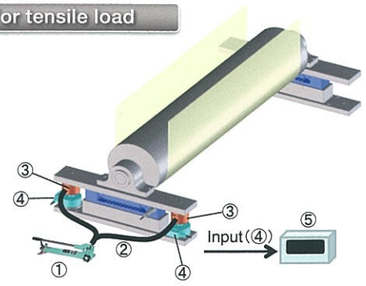
Option

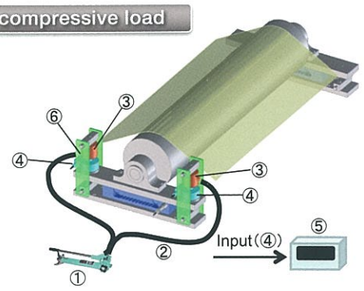
» Calibrator (PAT.P)

All of our load cells, LCT converter, and digital indicator are perfectly calibrated before shipping.
Therefore, inspection before starting operation at site is NOT REQUIRED.
On the other hand, calibration in life span will be required for maintaining accuracy and early detection of trouble on your facility.
Calibrator is available (as option) to satisfy customer request. We designed optimum one standing on our long experience.
There are two types for tensile load and compressive load.

For tensile load



For compressive load



Configuration
①Oil pump (manual)
②Oil hose
③Hydraulic jack
④Master load cell
⑤Digital indicator
⑥Fittings

Calibration method
1. Set transportable calibrator on tension meter at loading inspection.
2. Remove strip from tension meter.
3. Give load by hydraulic jack.
4. Compare outputs from master load cell and measuring load cell.

Purpose and merit of calibrator

A. Deterioration check for bellows of furnace

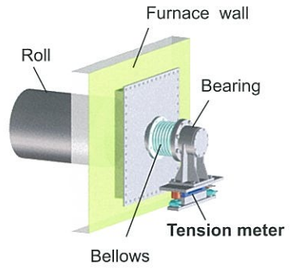
Continuous Galvanizing Line (CGL) is typical as facility which is equipped with tension meter. CGL has heat treatment furnace, and tension control in furnace is very important for quality control.
Age hardening of metal bellows which covers space between furnace wall and bearing housing affects accuracy of tension meter.
Calibrator is useful to check age hardening of bellows.

B. Check at installation

Calibrator can detect faulty installation of bearings, rolls, and motor.

C. Applicable to deduce the cause of trouble

Tension meter can be checked by calibrator. If it makes clear that there is no fault in tension monitoring, early start of checking other cause (such as one in motor) will be enabled.



JFE Advantech Co., Ltd.
formerly Kawatetsu Advantech Co., Ltd.
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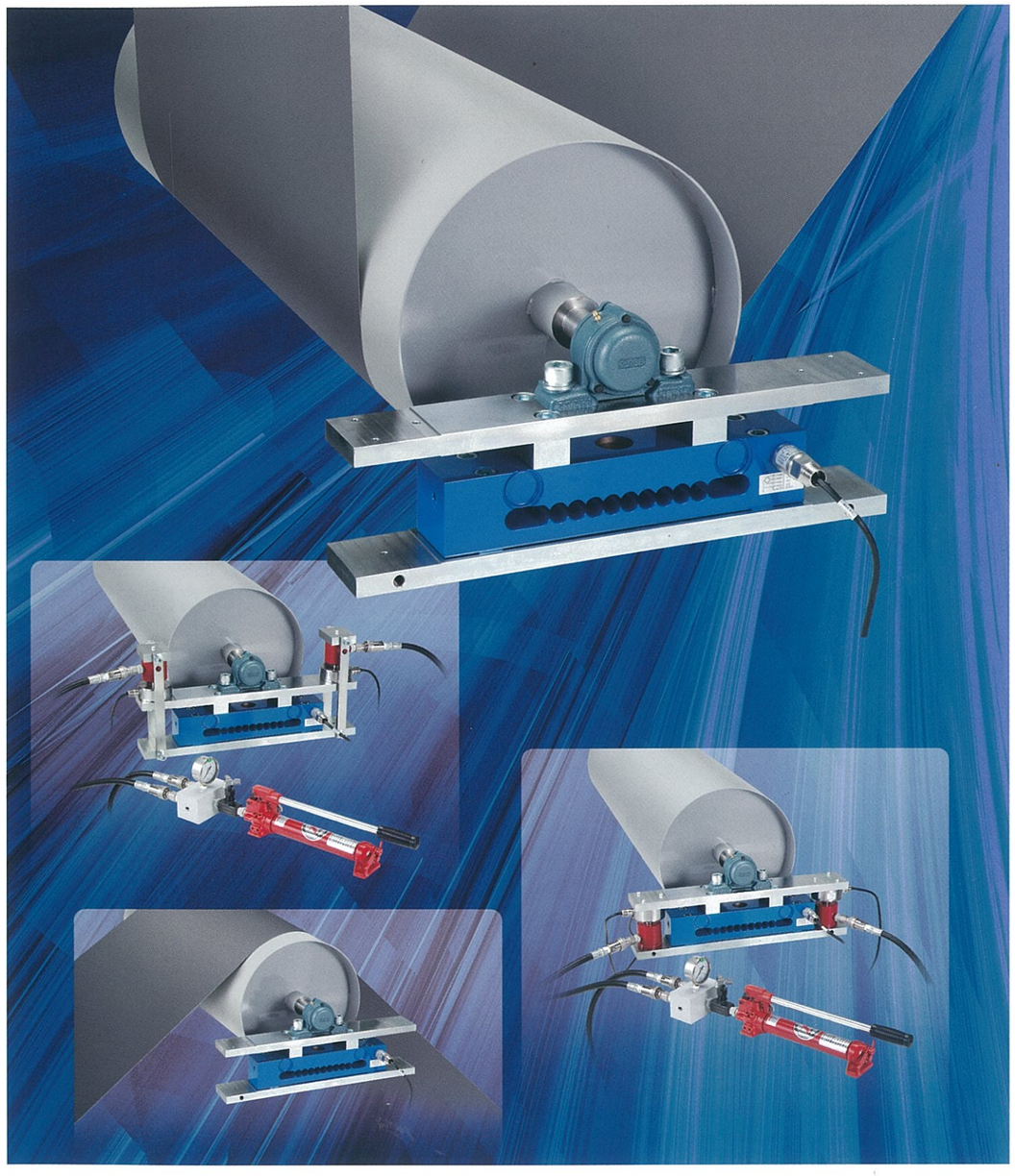
EC-TM-01A
12.10.2000 K

TM-V Series

Tension meter

High accuracy and reliability



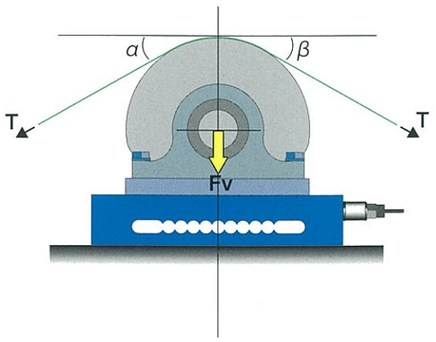
JFE Advantech Co., Ltd.

Load cell

Features

- Designed for easy instalation under bearings and good serviceability
- Accurate tension sensing by detecting force from strip
- Durability and long life assured by robust structure
- 360°direction free tension sensing
- Reliable enviromental protection by welded sealing (IP67/68)
- Wide variation of capacity (20kN - 400kN)
- Calibrator is also available (as option).
  Transportable calibrator can be used at each sensing point.

Principle



The measurement force (Fv) is a function of the strip tension (T) , the deflection angles (α and β), and the tare weight of the roll and bearings(Wt).

$$Fv = T(\sin\alpha + \sin\beta) + Wt$$

Then

$$T = (Fv - Wt) / (\sin\alpha + \sin\beta)$$

(Wt) is electronically compensated.

High accuracy on technology

TM-V series accurately detect vertical load (Fv) ***by strain gage technology.***
Dual shear webs in beam configuration ,the gage placement and circuit arrangement provide cancellation of bending strains due to either off-axis loads or side loads.

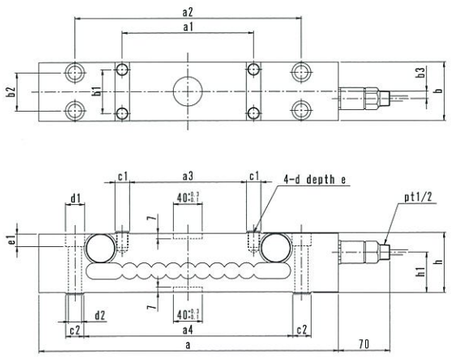
Specifications of load cell

Model	TM-V20	TM-V50	TM-V100	TM-V200	TM-V300	TM-V400
Rated load (R.L.)	20kN	50kN	100kN	200kN	300kN	400kN
Rated output (R.O.)	1.0±0.001 mV/V					
Nonlinearity	±0.2% R.O.					
Hysteresis	±0.2% R.O.					
Repeatability	0.03% R.O.					
Safe overload rating	400% R.L.					
Limited overload rating	600% R.L.					
Compensated temp. range	From -10℃ to +60℃					
Temp. effect on zero	0.003% R.O./℃					
Temp. effect on output	0.005% Load/℃					
Input resistance	800±40Ω					
Output resistance	700±30Ω					
Protection class	IP67 / IP68 (heavy duty type)					
Mass	15kg	15kg	18kg	26kg	30kg	40kg

Dimensions

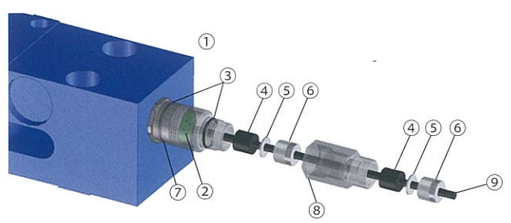
(mm)

Model	a	b	h	a1	a2	a3	a4	b1	b2	b3	c1	c2	d	d1	d2	e	e1	h1
TM-V20	410	80	82	180	310	160	286	60	52	10	20	25	M16	ϕ26	ϕ18	20	17	55
TM-V50	410	80	82	180	310	160	286	60	52	10	20	25	M16	ϕ26	ϕ18	20	17	55
TM-V100	410	96	82	180	310	160	286	66	66	17	20	25	M16	ϕ26	ϕ18	20	17	55
TM-V200	450	106	92	180	340	150	306	60	60	0	30	35	M24	ϕ39	ϕ26	35	26	66.5
TM-V300	500	120	100	220	416	180	376	68	68	0	40	40	M30	ϕ48	ϕ33	57.5	32	70.5
TM-V400	540	130	110	220	445	170	395	70	70	0	50	50	M36	ϕ58	ϕ39	59	38	79.5



■ Options

・Heavy duty type with double sealed cable outlet

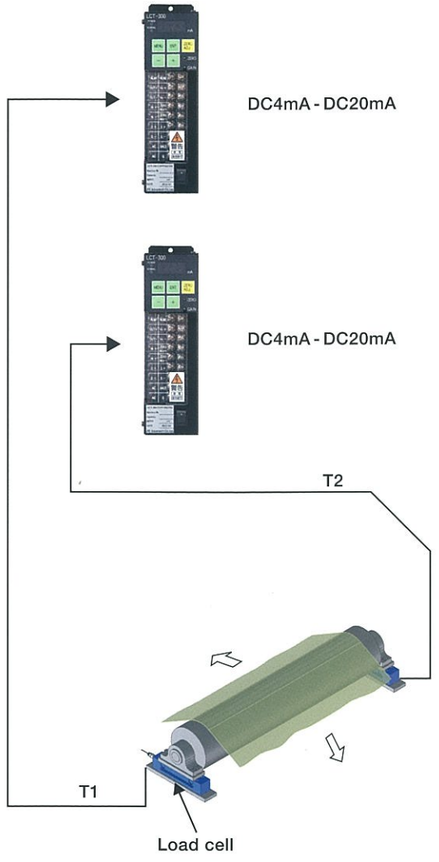


① Metal fitting
② Hermetic seal
& organic protective coating
③ O-ring
④ Rubber packing
⑤ Washer plate
⑥ Holding screw
⑦ Metal tube 1
⑧ Metal tube 2
⑨ Cable

Control Unit

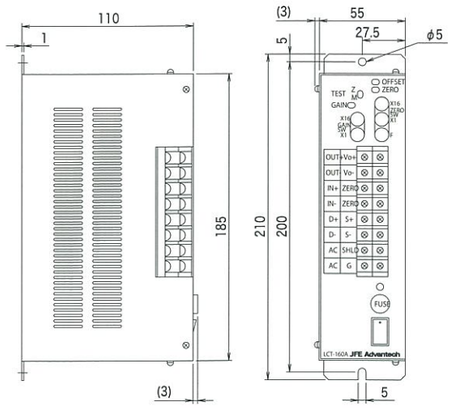
» Analog components

Load cell Converter

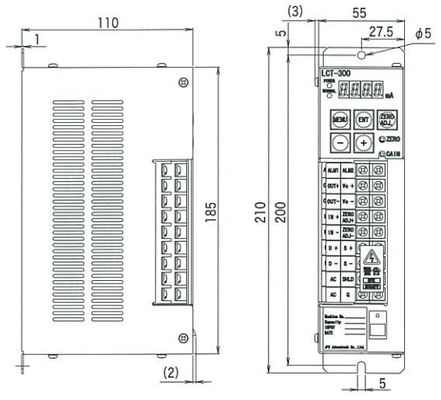


Load cell Converter

LCT-160A



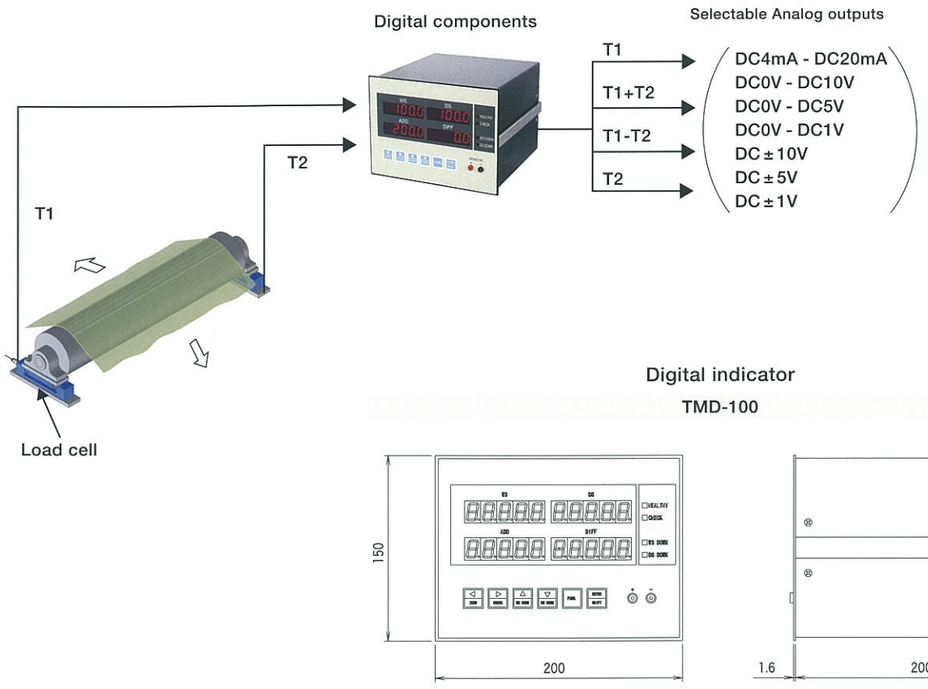
LCT-300



Load cell Converter

Type	LCT-160A	LCT-300
Load cell impressed voltage	DC10V, DC15V	DC10V, DC15V
Output signal	DC4mA - DC20mA (load resistance ≦600Ω)	DC4mA - DC20mA (load resistance ≦600Ω)
Non-linearity	±0.01%F.S.	±0.01%F.S.
Step response(0～90%)	4ms - 880ms (selectable)	2ms - 800ms (selectable)
Indicator	-	Digital indication
Intelligent zero adjustment	-	One touch operation
Power	AC100V - AC115V, 50/60Hz	AC100V - AC240V, 50/60Hz
Power consumption	15W	15W
Ambient temperature	From -10℃ to +55℃	From -10℃ to +60℃
Mass	1.1kg	0.9kg

» Digital components



Digital indicator

TMD-100

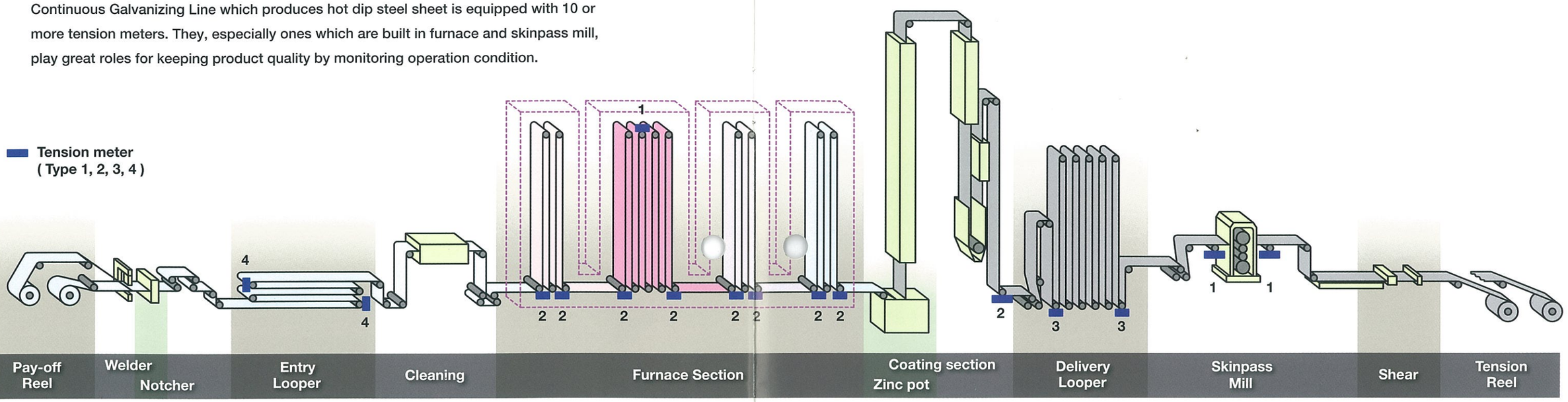
Digital indicator

Type	TMD-100
Load cell impressed voltage	DC10V×2ch
Output signal：selectable	DC4mA - DC20mA
Current （load resistance≦510Ω）	DC0V - DC1V, DC0V - DC5V, DC0V - DC10V
Voltage （load resistance≦5kΩ）	DC±1V, DC±5V, DC±10V
Non-linearity	±0.05%F.S.
Step response(0～90%)	10ms, 20ms, etc. (selectable)
Indicator	Digital indication
Contact output	Error, Healthy, DS Down, Run, WS Down
Intelligent zero adjustment	One touch operation
Power	AC100V - AC240V, 50/60Hz
Power consumption	25VA
Ambient temperature	From -10℃ to +50℃
Mass	4.4kg

Example of application

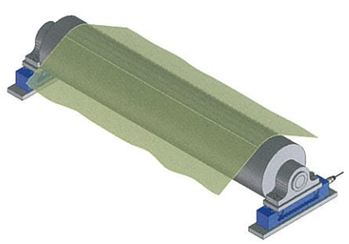
CGL:Continuous Galvanizing Line

Hot dip galvanized steel sheet is widely used for automotive industries and many other industrial fields as economically advanced anti-corrosion material.
Continuous Galvanizing Line which produces hot dip steel sheet is equipped with 10 or more tension meters. They, especially ones which are built in furnace and skinpass mill, play great roles for keeping product quality by monitoring operation condition.

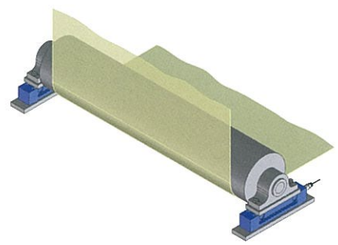


Installation Samples

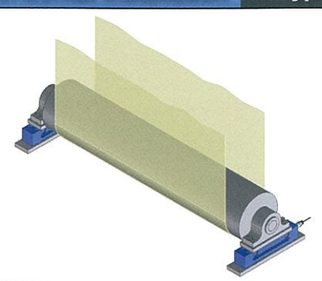
Horizontal Installation Type 1



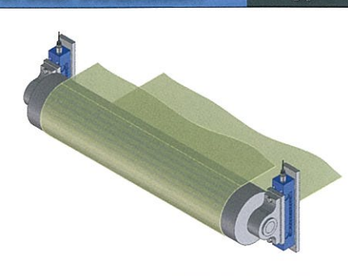
Horizontal Installation Type 2



Horizontal Installation Type 3



Vertical Installation Type 4



Selection of load cell from our lineup

To select most suitable load cell for your facility, please clarify your request about items shown here.

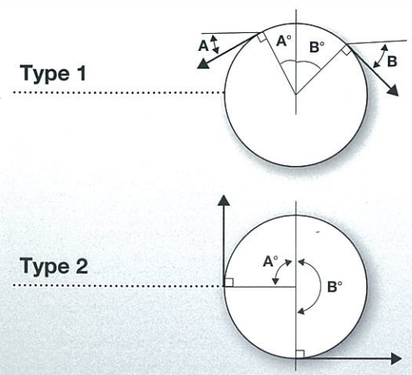
Planned strip tension

(1) Tension in normal operation
(2) Maximum tension

Weight of roll and bearing unit

Thickness of strip (regular and maximum)

Strip path angle



Height of bearing unit