Specification Sheet

600T Series Transmitters
Model 653L
Electronic temperature transmitter (PC programmable for RTD and resistance)

- High flexibility and wide rangeability
- Primary element and calibration selectable
- User-selectable output drive under input failure conditions
- Complies with relevant IEC requirements for test procedure and environmental protection
- CENELEC Intrinsic Safety / Flameproof and Factory Mutual approvals
- Configurable to the actual application by standard PC

600T Series transmitter
A complete family of process transmitters providing high performance in real operating conditions
FEATURES
Model 653L electronic transmitter is an extension of the Kent-Taylor 2-wire analog product line. It is designed for factory setting, in order to meet the specific application requirement of measuring low level signals from resistance thermometer (RTD) or resistance (ohm). The instrument can be easily reconfigured for actual requirements by simple procedures through a standard PC equipped with a specific software available on request. (Part no. AN0239)

The temperature transmitter can be mounted directly on a thermowell and thermowell extension, or it can be mounted remotely on a pipestand. The transmitter assures operational security by using non-volatile memory and also handling up/down scale procedure under sensor anomalies. Compact, rugged, lightweight, easy to install and service, Kent-Taylor transmitters provide consistently reliable and stable performance under all types of process conditions, coupled with minimum maintenance requirements.

FUNCTIONAL SPECIFICATIONS

RTD INPUT
Resistance thermometer Pt100 3 wires
(IEC 751/DIN 43760; α = 0.00385)
  Measuring range : -200 to +850°C (-328 to +1562°F)
  Minimum span : 25°C (45°F)

Resistance thermometer Ni100 3 wires
(DIN 43760; α = 0.00618)
  Measuring range : -60 to +250°C (-76 to +482°F)
  Minimum span : 25°C (45°F)

LINEAR RESISTANCE INPUT
3 wires
  Measuring range : 0 to 10 kΩ
  Minimum span : 30 Ω

Response Time selectable time constant (63%)
  0.33 to 60 sec. as defined.

Loss of input
  The analog signal can be selected up to a minimum value of 3.5 mA or a maximum value of 23 mA.

Power supply (at transmitter terminals)
  The transmitter operates on 8 to 35 Vdc with no load and is protected against reverse polarity connection.
  Minimum operating voltages :
    • 8 Vdc without options
    • 10 Vdc with optional LCD meter
  For Ex ia approval power supply must not exceed 28 Vdc.

Warm-up time
  Operation within specification in less than 5 min.

Update time
  135 ms approx.

Input impedance
  10 MΩ

Output signal
  Two-wire 4 to 20 mA dc., linear with ohms or linear with true temperature for RTD.

Optional output meter
  LCD : 3 1/2 digit (±1999 counts) with 10 mm (3/8 in) high, 7-segment characters. Engineering unit labels are provided.

Max. offset (input)
  50% of max. value

Load limitations
  Total loop resistance including optional remote indicator line : see figure.

Temperature limits
  Ambient
    -40 and +85°C (-40 and +185°F)
    with LCD meter : -20 and +80°C (-4 and +176°F)
  Storage
    -50 and +120°C (-58 and +248°F)
    with LCD meter : -40 and +85°C (-40 and +185°F)

Humidity
  0 to 90% RH
PERFORMANCE SPECIFICATIONS
If not otherwise stated values as % should be considered percent of calibrated span.

COMMON CHARACTERISTICS
Linearity error
< 0.1%

Temperature coefficient
< ±0.01%/°C

Signal/noise ratio
min. 60 dB

Output meter indication accuracy
LCD: ± 0.1% of calibrated span ± 1 digit

Supply voltage
Within voltage/load specified limits the total effect is less than 0.005%/V.

Load
Within load/voltage specified limits the total effect is less than 0.01%/100Ω.

EMI/RFI
Meets EN50081 for emission and EN50082 for immunity when instrument is properly installed with or without output meter.

Vibration
IEC 68-2-6 Test FC
Lloyd's specification no. 1 : 4g/2-100 Hz

Mounting Position
The transmitter may be mounted in any position with no effect on output signal.

RTD INPUT
Basic accuracy
± 0.3°C

Sensor current
0.2 mA to 0.4 mA

Temperature coefficient
span <100°C: ± 0.01°C/°C

Effect of sensor cable resistance (3-wire)
<0.002 Ω/Ω

Max. cable resistance per wire
10 Ω

LINEAR RESISTANCE INPUT
Sensor current
0.2 mA to 0.4 mA

Effect of sensor cable resistance (3-wire)
< 0.002 Ω/Ω

Max. cable resistance per wire
10 Ω

Configuration
The transmitter is supplied according to ordered configuration option as follows:

Standard configuration
Sensor type, calibration @ 4-20 mA values (specify range when ordering), response time, broken sensor drive and optional LCD meter scale are in accordance with selected options.

PHYSICAL SPECIFICATIONS

Materials
Housing and covers
Low copper aluminium alloy with baked epoxy finish; AISI 316 L ss

Covers O-ring
Buna N

Tagging
AISI 316 ss data plate attached to the electronics housing.

Mounting bracket (*)
Zinc plated carbon steel with chrome passivation; AISI 316 L ss

Optional extras
Output meter Plug-in rotatable type, LCD. Standard LCD meter scale is 0 to 100% linear; special linear scale to specified range and engineering unit is available.

Supplemental customer tag
AISI 316 ss tag fastened to the transmitter with stainless steel wire for customer's tag data up to a maximum of 56 characters and spaces on two lines for tag number and tag name, and up to a maximum of 28 characters and spaces for calibration details.

Configuration kit
Includes 3.5" configuration program disk, a RS232 interface unit, a cable set for transmitter and PC connection providing adaptor and the user manual (order as Part no. AN0239).

Mounting bracket
For 60 mm. (2in) stand pipe or wall mounting.
**Environmental protection**

**Wet and dust-laden atmospheres**

- The transmitter is dust and sand tight and protected against immersion effects as defined by IEC 529 (1989) to IP67.
- Suitable for tropical climate operation as defined in DIN 40.040, application class GQC.

**Hazardous atmospheres**

- With or without output meter
- INTRINSIC SAFETY
  - CENELEC DEMKO approval: certificate no. 97D.122159
  - EEx ia IIC T4 (T_{amb} -40 to +85°C)/T6 (T_{amb} -40 to +60°C)
  - FLAMEPROOF
  - CENELEC/CESI Approval: certificate no. Ex-95.D.111
  - EEx d IIC T5 (T_{amb} -40 to +85°C)/T6 (T_{amb} -40 to +70°C)
- FACTORY MUTUAL:
  - Explosionproof: Class I, Div. 1, Groups B, C, D
  - Dust ignitionproof: Class II, Div. 1, Groups E, F, G
  - Suitable for: Class II, Div. 2, Groups F, G; Class III, Div. 1, 2
  - Nonincendive: Class I, Div. 2, Groups A, B, C, D
  - Intrinsically safe: Class I,II, III, Div. 1, Groups A, B, C, D, E, F, G

**Electrical connections**

- Two 1/2 NPT or M20 x 1.5 or PG 13.5 or 1/2 GK threaded conduit entries, direct on housing, both available for output/supply signal when the sensor is mounted remotely.
- Alternatively, one 1/2 NPT threaded entry for integrally mounted sensor and one 1/2 NPT or M20 x 1.5 or PG 13.5 or 1/2 GK threaded entry for output/supply signal, direct on housing.

**Terminal block**

- Two terminals for 4-20 mA output/supply signal wiring up to 2.5 mm² (14 AWG) and two jacks compatible with 3 mm dia miniature plugs.
- Three terminals for input signal wiring up to 1.5 mm² (16 AWG)

**Grounding**

- Internal and external 6 mm² (10 AWG) ground termination points are provided

**Mass**

- 1 kg approx (2 lbs) without sensor and options

**Packing**

- Expanded polythene box

(*) U-bolt material: AISI 400 ss; screws material: high-strength alloy steel or AISI 316ss
**ORDERING INFORMATION**

Select one character or set of characters from each category and specify complete catalog number.

**PRODUCT CODE**

| a | Base Model | 1st to 5th characters | Codice |
| b | Temperature Transmitter | | 653LY |
| c | f | Input Sensor | 6th character |
| d | Remote | | 1 |
| e | Integrally mounted (NOTE 1) (one 1/2" NPT CONNECTION ENTRY IS PROVIDED) | | 5 |
| f | NOTE 1 : quoted separately |
| g | gh | Electrical Certification | 9th character |
| h | General Purpose | | 1 |
| i | Intrinsic Safety to CENELEC EN50014-20 DEMKO approval to EEEx ia IIC T6/T4 | | 2 |
| j | Flameproof to CENELEC EN50014-18 CESi approval to EEEx d IIC T6/T5 (NOTE 2) | | 3 |
| k | Intrinsic Safety and Flameproof, as above, CESi approval (NOTE 2) | | U |
| l | Factory Mutual (FM) (only available with Remote sensor and 1/2" NPT electrical connections) | | 7 |
| m | NOTE 2 : if integral sensor is required this must be supplied by ABB Kent-Taylor Lenno |
| n | j | Housing | 10th character |
| o | Material | Electrical connections | |
| p | Aluminium alloy | 1/2" NPT | 1 |
| q | | CM 20 | 2 |
| r | | Pg 13.5 | 3 |
| s | | 1/2" GK | 4 |
| t | AISI 316 L ss | 1/2" NPT | A |
| u | | CM 20 | C |
| v | | Pg 13.5 | D |
| w | | 1/2" GK | F |
| x | k | Output Meter | 11th character |
| y | None | | 1 |
| z | Digital LCD linear 0-100% user scalable | | 3 |
| { | Digital LCD linear scale (specify range and engineering units) | | 5 |
| | l | Mounting Bracket | 12th character |
| | None | | 1 |
| | Carbon steel | | 2 |
| | AISI 316 L ss | | 3 |
| | mn | 13th - 14th character | |
| | Use code | | 00 |
| | o | Calibration Certificate | 15th character |
| | Not required | | 1 |
| | For the transmitter only | | 3 |
| | For the transmitter and the integrally mounted input sensor | | 4 |
DIMENSIONS AND MOUNTING DETAILS
(Not for construction unless certified)