DATASHEET

# SpeedSys® T10 – T20 – T30

speed transmitters, monitors & switches

## SpeedSys® T10 – T20 – T30

### Speed transmitters, monitors & switches

The SpeedSys® tachometer series is a range of speed measurement systems that deliver extensive speed monitoring functions for rotating equipment. The tachometers convert speed sensor signals into processed outputs.

The tachometers feature a small technical footprint with low-impact installation and are available in single, double, and triple-channel versions to suit any application.


## SPEED MONITORING FOR A WIDE RANGE OF APPLICATIONS

- Speed monitoring and switching on rotating equipment.
- Advanced signal conditioning and conversion into highly accurate outputs for further processing
- Multi-channel devices feature extensive monitoring functions, including reverse rotation, creep, overspeed, underspeed, acceleration, standstill, and dynamic sensor monitoring.

*Typical applications include:*

- Compressors and pumps
- Microturbines
- Wind turbines
- Gas and steam turbines
- Marine applications
- Elevators
- General automation

## KEY FEATURES

- Very fast system response to overspeed condition
- Two fast responding relays per channel.
- Modbus connectivity
- Suitable for 3-wire voltage sensors and 2-wire voltage sensors

## SYSTEM OVERVIEW

| Interfaces | *T10* | *T20* | *T30* |
|---|---|---|---|
| Sensor inputs | 1x sensor input | 2x sensor input | 3x sensor input |
| Digital inputs | 1x digital input | 2x digital input | 3x digital input |
| Relay outputs | 1x DPST | 2x DPST | 3x DPST |
| | 1x SPST | 2x SPST | 3x SPST |
| Analog outputs | 1x analog output | 2x analog output | 3x analog output |
| Frequency outputs | 1x frequency output | 2x frequency output | 3x frequency output |
| Power supply | 1x power supply | 2x redundant power supply | 3x redundant power supply |
| Modbus | 1x Modbus TCP | 1x Modbus TCP | 1x Modbus TCP |

| Speed monitoring | *T10* | *T20* | *T30* |
|---|---|---|---|
| Overspeed | Yes | Yes | Yes |
| Underspeed | Yes | Yes | Yes |
| Acceleration | | Yes | Yes |
| Standstill / creep | | Yes | Yes |
| Reverse rotation | | Yes | Yes |
| Dynamic channel monitoring | | Yes | Yes |
| Software voting | | 1oo2; 2oo2 | 1oo2; 2oo2; 1oo3; 2oo3; 3oo3 |
| Cross coupling inputs | | Yes | Yes |

## INPUT

### Sensor input

| | |
|---|---|
| Sensor input | Input for (a) 3-wire voltage, (b) 2-wire voltage |
| Frequency range T10, T20, T30 | 0.025 Hz to 35 kHz |
| Measurement accuracy | 0.05 % |

### (a) 3-wire voltage input

| | |
|---|---|
| Input type | 3-wire voltage input (typical: Hall effect or proximity sensor) |
| Sensor power supply | 24.0 V (@ 25 mA) |
| Input range | 0 V to 24 V |
| Trigger level (programmable) | 0 V to 12 V |
| Impedance | 500 kΩ (typical) |
| Sensor monitoring | Open circuit detection, sensor power supply short circuit detection |

### (b) 2-wire voltage input

| | |
|---|---|
| Input type | 2-wire voltage input (typical: electromagnetic sensor) |
| Sensor power supply | n/a |
| Input range | 50 $mV_{RMS}$ to 80 $V_{RMS}$ |
| Trigger level (programmable) | -12 V to 12 V |
| Impedance | 100 kΩ |
| Sensor monitoring | Open circuit detection |

### Digital input

| | |
|---|---|
| Input range | 0 V to 24 V, max 25 mA |
| Logic “0” | < 10 V |
| Logic “1” | > 14 V |
| Impedance | 1 kΩ |

## OUTPUT

### Relays

| | |
|---|---|
| Number | T10 – 2x high speed relays<br>T20 – 4x high speed relays<br>T30 – 6x high speed relays |
| Types | T10 – 1x DPST (2x COM & 2x NO) and 1x SPST (1x COM and 1x NO)<br>T20 – 2x DPST (2x COM & 2x NO) and 2x SPST (1x COM and 1x NO)<br>T30 – 3x DPST (2x COM & 2x NO) and 3x SPST (1x COM and 1x NO) |
| Function | User-configurable relays for speed limits (e.g., overspeed or underspeed) |
| Maximum switching capacity | 30 $V_{DC}$ / 2 A (resistive load)<br>30 $V_{DC}$ / 100 mA (inductive load) |
| Hysteresis | User-configurable |
| Trip state | User-configurable normally open or normally closed |

### Analog output

| | |
|---|---|
| Number | T10 – 1x analog output.<br>T20 – 2x analog output.<br>T30 – 3x analog output. |
| Type | 4 to 20 mA current loop. |
| Function | User-configurable range to transmit current output value equivalent to the measured speed. |
| Resolution | 16 bit (0 – 24 mA) |
| Accuracy | 0.05 % |

### Digital frequency output

| | |
|---|---|
| Number | T10 – 1x frequency output.<br>T20 – 2x frequency output.<br>T30 – 3x frequency output. |
| Type | Digital open collector output. |
| Signal | Max 24 $V_{DC}$ / 10 mA. |

### Status LED indicators

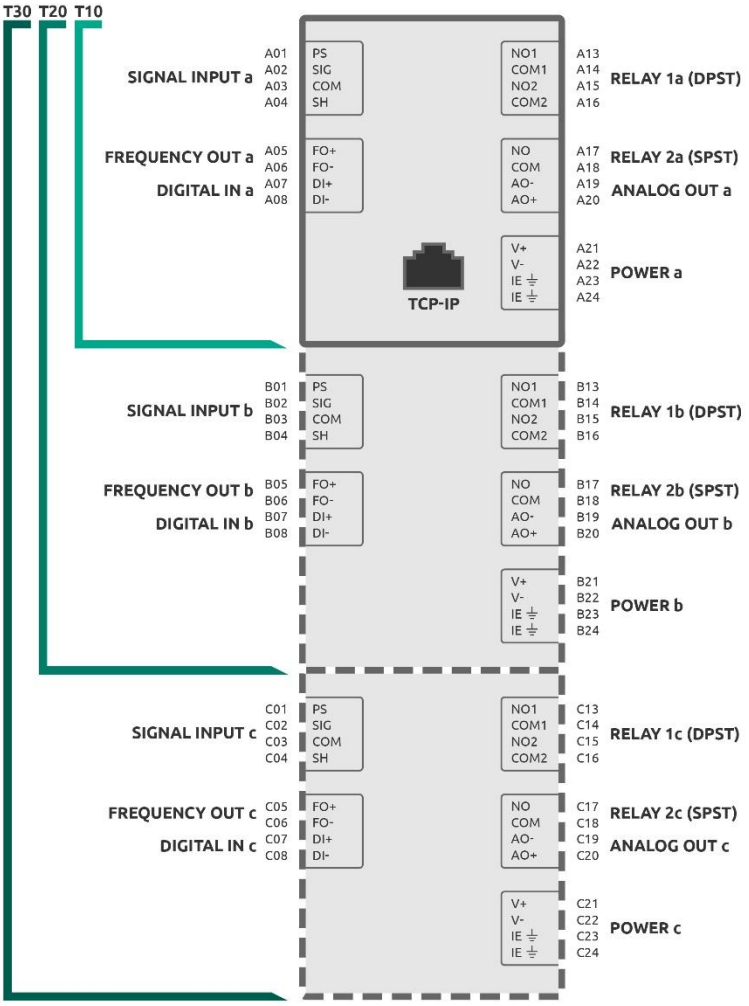
| | |
|---|---|
| LED indicators | T10 – 1x relay status & 1x system status<br>T20 – 2x relay status & 2x system status<br>T30 – 3x relay status & 3x system status |

## SYSTEM FEATURES

| | | |
|---|---|---|
| **Reaction time** | | |
| Speed measurement time ($T_m$) | Dependent on selected measurement time. (2 – 1000 ms, 10 ms default) | |
| Hardware reaction time ($T_h$) | Relays: | ≤ 4 ms |
| | Analog out: | ≤ 100 ms |
| Total reaction time ($T_h + T_m$) | Relays, typical: | ≤ 6 ms @ $T_m$ = 2 ms |
| | | ≤ 14 ms @ $T_m$ = 10 ms (default) |
| | Analog out, typical: | ≤ 100 ms |
| **PC interface** | TCP/IP programming and status reading | |
| | (Windows® 10 and higher proprietary software application) | |
| **Modbus interface** | Modbus TCP | |
| **Power supply input** | | |
| Input voltage range | 24 $V_{DC}$ (18 $V_{DC}$ – 31,2 $V_{DC}$) | |
| Current consumption | T10 – max 160 mA | |
| | T20 – max 320 mA (max 160 mA / channel) | |
| | T30 – max 480 mA (max 160 mA / channel) | |
| Reverse polarity protection | No | |
| **Heat dissipation** | T10 – max 4 W | |
| | T20 – max 8 W | |
| | T30 – max 12 W | |
| **Housing** | | |
| Material | Polyamide (PA 66 GF 30) | |
| Dimensions | T10 – 22.5 x 127 x 114 mm (0.89 x 5.00 x 4.49”) | |
| | T20 – 45.0 x 127 x 114 mm (1.78 x 5.00 x 4.49”) | |
| | T30 – 67.5 x 127 x 114 mm (2.67 x 5.00 x 4.49”) | |
| Weight | T10 – 240 g | |
| | T20 – 324 g | |
| | T30 – 414 g | |
| Mounting assembly | DIN rail | |
| Connectors | Push-in type terminals | |
| **Environmental conditions** | | |
| Operating temperature | -20 to 60 °C (-4 to 140 °F) | |
| Storage temperature | -40 to 85 °C (-40 to 185 °F) | |
| Operating & storage humidity | 95 %. Condensation to be avoided. | |
| **Conformal coating** | Yes | |
| **Ingress protection** | IP20 according to IEC 60529 | |
| | Indoor use or use in a protective enclosure | |
| **Other** | Overvoltage category II | |
| | Pollution degree 2 | |

## DIMENSIONS AND MOUNTING


## CONNECTION DIAGRAM



## APPROVALS

| | |
|---|---|
| **International standards** | CE; UKCA |
| **Electromagnetic compatibility** | EN 61326-1 |
| **Environmental** | RoHS 3 |
| **Marine type approval** | DNV Type approved product |

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