JAQUET T400

UNIVERSAL TACHOMETER













JAQUET T400 Speed measurement, switching and indicating instruments

TYPICAL APPLICATIONS

DIESEL ENGINE START CONTROL AND OVER-SPEED PROTECTION

MICRO TURBINE MEASUREMENT AND PROTECTION

TURBOCHARGER SPEED MEASUREMENT
MACHINE PROTECTION IN SAFETY CRITICAL
APPLICATIONS

Universal speed measurement and indication

FEATURES

- Converts absolute speed into an analog signal
- Including 2 limits (A/B) with programmable hysteresis
- One changeover relay assigned via binary input to limit (A or B)
- T411 and T412 models with display
- Isolated signal input with automatic trigger level adjustment
- Built in isolated sensor supply with sensor monitoring
- Open collector output of sensor frequency
- Accuracy class 0.05% for limits and 0.5% for analog signals
- Configuration and status via Windows® software
- 5 digit machine factor allowing configuration and display in machine units
- Wide tolerance 10...36 VDC power supply

T400 ADVANTAGE

- Fast response to over speed conditions
- Germanischer Lloyd's and ABS approval for marine applications
- Digital display of speed value for the models T411 and T412
- \bullet 0/4...20 mA or 0/2...10 V analog output with rising or falling characteristics
- Adaptive trigger provides high noise immunity e.g. with electromagnetic sensors
- Digital input for direct treatment of frequency signals
- 2 possible relay configuration sets e.g. for start up bridging, controlled via binary inputs
- Pluggable terminals
- Integrated 2 or 3 wire sensor monitoring and system watchdog

One channel tachometer family T400

| Type and part numbers | T401.00 | 420mA | output | | 383Z-05307 |
|-----------------------|----------|------------------------|--|-----------|------------|
| | T402.00 | 210 V | ouput | | 383Z-05308 |
| | T411.00 | display; 420 mA output | | | 383Z-05318 |
| | T412.00 | display; | display; 210 V output display; 5 VDC sensor supply; 420 mA output display; 5 VDC sensor supply; 210 V output | | |
| | T411.03 | display; | | | |
| | T412.03 | display; | | | |
| | | | | | |
| Optional accessories | Power su | pply | 100-240 VAC /24 | VDC / 1 A | 383Z-05764 |

Technical data

Measuring range Lowest: 0...1.000 Hz Highest: 0...35.00 kHz

Measurement timeConfigurable min. measurement time (t_M): 2/5/10/20/50/100/200/500 ms, 1/2/5 sReaction timeCurrent output: Typical $t_M + 7.5$ msMaximum Input period $+ t_M + 7.5$ ms

Interface cable RS232 for configuration

USB adapter for interface cable

Relays: Typical t_{\diamond} + 10.5 ms Maximum Input period + t_{M} + 10.5 ms

Accuracy 0.5% referred to the analog output end of range value

Analog output (1) T401/T411: Current output 0...20 mA resp. 4...20 mA

T402/T412: Voltage output 0...10 V resp. 2...10 V

Programmable rising or falling transfer function (min. end value 1.00 Hz) Load T401/T411: max. 500 Ohms corresponding to a maximum of 10 V Load T402/T412: min. 7 kOhm corresponding to a maximum of 1.4 mA

830A-36889

830A-37598

Maximum open circuit voltage: 12 V

Resolution: 12 bit corresponding to 1:4096

Maximum linearity error: 0.1 %

Temperature drift: typ. ± 100 ppm/degree K, max. ± 300 ppm/degree K

Set points /relay (2) Hysteresis: For each limit an upper and a lower set point may be set independently

Change over contact: max. 250 VAC, 1250 VA (DC: see operating instructions)

Data I/O RS232 interface with +5 V-CMOS level 3-pole. 3.5 mm stereo headphone connector on

the front side.

Sensor input (1)

Input resistance Analog 30 kOhm / Digital 46 kOhm

Frequency range 0.01 Hz /35 kHz

Trigger level Analog input: Adaptive trigger level from 28 mV to 6.5 V or 250 mV to 6.5 V peak de-

pending on the amplitude of the input signal.

Digital input: Digital fixed trigger at 3 V ± 1.5 V hysteresi

Sensor supply

Standard + 14 V, max. 35 mA, short-circuit proof S5 version + 5 V, max. 35 mA, short-circuit proof

Built-in pull up and pull down resistor 820 Ohm for connection of two-wire trans-

mitters or daisy chaining of T400's

Sensor monitoring Sensor monitoring 3 wire sensors: programmable current consumption limits of

 $0.5 ... 35 \text{mA}. \;$ Outside the selected range the sensor is signaled as faulty .

Electromagnetic sensors: continuity checked. Open circuit signaled as a fault.

None: Both sensor monitoring functions may be disabled.

Open collector output (1) Galvanically separated output of sensor frequency



Binary inputs (1) For external selection between two sets (A/B) of programmable relay control and acknow-

ledge functions: (No external pull up needed)

Low active :U \leftarrow +1.5V High (open) :U \rightarrow +3.5V

Environmental KUE according to DIN 40 040

Operating temperature: - 40...+85 °C Storage temperature: -40...+90 °C

Relative humidity up to 75% average over one year period, up to 90% max. for 30 days

Power supply 10...36 VDC power consumption max. 3 W

Insulation Galvanic separation between power supply, current output and the sensor power supply.

Isolation 700 VDC / 500 VAC. Relay contact isolation: 1500 AC

EMC Electromagnetic compatibility: Radiation in accordance with international standards and

EN 50081-2. Immunity in accordance with international standards and EN 50082-2

Conducted emissions: CISPR 16-1, 16-2 Radiated emissions: EN 55011

Electrostatic discharge: IEC 61000-4-2 Electromagnetic fields: IEC 61000-4-3

Conducted fast transients: IEC 61000-4-4 Conducted slow transients: IEC 61000-4-5

Conducted high frequency: IEC 61000-4-6 Pulse modul. elec. field: ENV 50140

Power frequency magnetic field: IEC 1000-4-8

T411/412

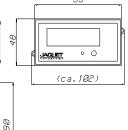
Standards EN 50155, GL / Germanischer Lloyd, ABS

Dimensions

T401/402

80 112.6

141



8

Rail DIN 4622713 (EN 50022) or mounting plate to DIN 43660 (46121)

Housing Protection class IP40, terminals IP20

Terminals Pluggable

Weight T401/T402: 150 g, T411/T412: 210 g

T400 systems are supplied with a full documentation and the $T400\,$ Windows@ Software.

The software allows:

- Quick and easy configuration of all operating parameters
- · Unit interrogation of identity and parameters
- · PC display of current measurement and relay status
- · Archiving and printing of the configuration

RS-232 cable not included, see page 2 for optional accessories.

Please note: Information is subject to change. For more technical information please refer to operating instructions.

COMPANY PROFILE





Our industry and application specific expertise ensures that you will achieve an optimum solution. Completely matched to your individual requirements, meeting key industrial standards and certifications, our products help boost the performance of your machinery while reducing cost of ownership.



TYPICAL INDUSTRIES SERVED

- Automotive and truck
- Aerospace
- Diesel / Gas engines
- Hydraulics
- Railway
- Turbines
- Turbochargers
- Industrial machinery



PRODUCTS - SPEED SENSORS

- Various technologies
- Standard, custom and OEM models
- \bullet For demanding applications, e.g. 300,000 rpm, temperature up to 320 °C / 600 °F, high vibration, shock to 200 g, etc.
- GreenLine speed sensors for general applications
- Ex models for hazardous areas
- Pole bands and target wheels available where needed



PRODUCTS - SYSTEMS

- Multi-channel overspeed protection systems
- 1-2 channel measurement, protection and control modules
- Engine diagnostic systems
- Redundant speed measurement and indication



SPECIAL PROJECT EXAMPLES

- An automotive linear movement sensor
- Integrated power and torque measurement for display and gearbox control
- Naval spec. turbine protection for nuclear submarines
- Speed measurement in turreted, tracked vehicles



QUALITY MANAGEMENT AND STANDARDS

- Quality management: TS 16949 and ISO 9001, ZELM ATEX 1020, KWU
- Sensors: GL, KWU, TÜV, ATEX, EN 50155, NF F 16-101 102, ABS, EMC
- Systems: IEC 61508 SIL 2 and SIL 3, API 670, GL, TÜV, KWU, EX
- Environmental: RoHs EU directive 2002/95/EC



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- Flexible production quantities; from 1 to millions per project
- Reduction of total costs by intelligent and cost-effective solutions