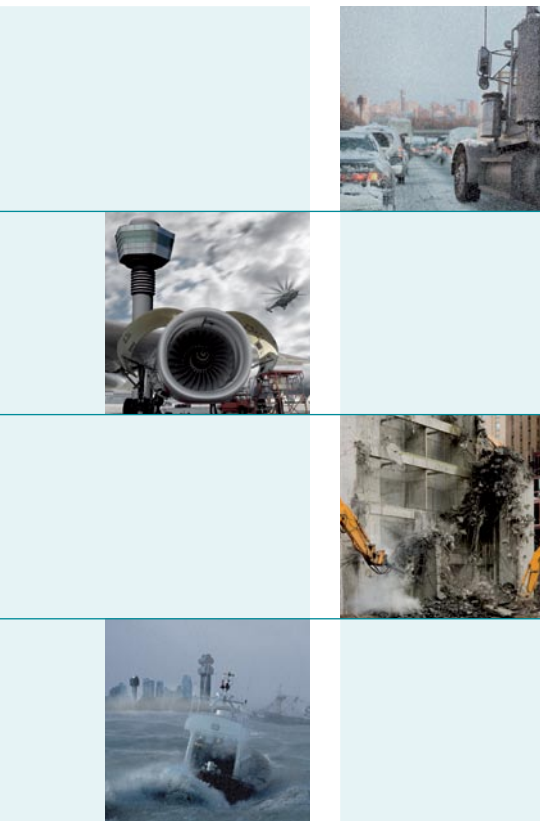




## GREEN LINE

### INDUSTRIAL SPEED SENSORS

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JAUQUET corporate overview

## Industrial speed sensors and tachometers

The GreenLine family is the newest line of industrial speed sensors and control modules from JAUQUET TECHNOLOGY GROUP. These sensors and tachometers provide solutions for speed sensing and control applications both for end users and small OEM's. Our offering of 50 plus sensors and 4 tachometer modules allows straight forward signal detection, monitoring and conditioning.

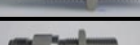
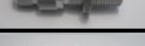
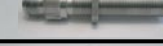
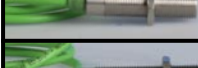
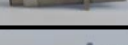
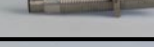
Sensors are available with VR or Hall technologies with cable or connector interfaces. Sizes range from 3/8-24 and M10X1 to 3/4-16 and M16X1.5. Sensor capability ranges from zero speed to high frequency detection and all units have sealed sensing areas to prevent liquid intrusion. Also available are direction sensing units and hazardous location versions for both North America (NEC, CEC) and Europe (ATEX).

The JAUQUET T400 series F-DC tachometers are available with current or voltage analog output and they also provide a sine to square wave converter/re-transmit signal, sensor health monitoring and a high/low limit relay. All inputs and outputs are galvanically isolated. T400's are configured via a PC with supplied software using the PC-T400 cable. Available packages include DIN-rail mount and panel mount with display.

The new GreenLine sensors and tachometers can be used to provide either a complete measurement chain solution or individual speed sensing products as needed. Technical product overviews follow in this brochure, while complete data sheets are available on [www.jaquet.com](http://www.jaquet.com) under the GreenLine sensors link.

## VR ELECTROMAGNETIC SPEED SENSORS

- **Temperature rating:** -40...125°C • **Signal output:** Frequency and amplitude proportional to speed
- **Frequency range:** up to 20 kHz • **Electrical:** Sine wave output, 850 Ohm, 135 mH
- **Module / DP Range:** M: 0.5 or larger / DP: 50 or coarser

| PICTURE                                                                             | TYPE    | HOUSING                                    | CONNECTION                            | MECHANICAL                                      |
|-------------------------------------------------------------------------------------|---------|--------------------------------------------|---------------------------------------|-------------------------------------------------|
|    | E12A    | Threaded M12x1 stainless steel IP67        | Connector, M12x1, 4 pin, sealed       | Overall length: 60 mm<br>Thread length: 40 mm   |
|    | E12S    | Threaded M12x1 stainless steel IP67        | Cable, silicone, 1m 0.34 mm², AWG 22  | Overall length: 69 mm<br>Thread length: 50 mm   |
|    | E16A    | Threaded M16x1.5 stainless steel IP67      | Connector, M12x1, 4 pin, sealed       | Overall length: 60 mm<br>Thread length: 40 mm   |
|    | E16A25  | Threaded M16x1.5 stainless steel IP67      | Connector, M12x1, 4 pin, sealed       | Overall length: 84 mm<br>Thread length: 64 mm   |
|    | E16A40  | Threaded M16x1.5 stainless steel IP67      | Connector, M12x1, 4 pin, sealed       | Overall length: 122 mm<br>Thread length: 102 mm |
|    | E16AM   | Threaded M16x1.5 stainless steel IP67      | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 61 mm<br>Thread length: 33 mm   |
|    | E16AM25 | Threaded M16x1.5 stainless steel IP67      | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 92 mm<br>Thread length: 64 mm   |
|    | E16AM40 | Threaded M16x1.5 stainless steel IP67      | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 130 mm<br>Thread length: 102 mm |
|   | E16S    | Threaded M16x1.5 stainless steel IP67      | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 69 mm<br>Thread length: 50 mm   |
|  | E16S25  | Threaded M16x1.5 stainless steel IP67      | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 83 mm<br>Thread length: 64 mm   |
|  | E16S40  | Threaded M16x1.5 stainless steel IP67      | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 121 mm<br>Thread length: 102 mm |
|  | E38A    | Threaded 3/8"- 24 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 48 mm<br>Thread length: 34 mm   |
|  | E38S    | Threaded 3/8"- 24 UNF stainless steel IP67 | Cable, silicone, 1m 0.34 mm², AWG 22  | Overall length: 54 mm<br>Thread length: 34 mm   |
|  | E58A    | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 60 mm<br>Thread length: 40 mm   |
|  | E58A25  | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 84 mm<br>Thread length: 64 mm   |
|  | E58A40  | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 121 mm<br>Thread length: 102 mm |
|  | E58AM   | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 61 mm<br>Thread length: 33 mm   |
|  | E58AM25 | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 92 mm<br>Thread length: 64 mm   |
|  | E58AM40 | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 130 mm<br>Thread length: 102 mm |
|  | E58S    | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1m 0.34 mm², AWG 22  | Overall length: 69 mm<br>Thread length: 50 mm   |
|  | E58S25  | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 83 mm<br>Thread length: 64 mm   |
|  | E58S40  | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 121 mm<br>Thread length: 102 mm |

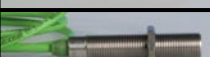
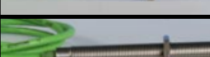
## VR ELECTROMAGNETIC SPEED SENSORS

- **Temperature rating:** -40...200°C • **Signal output:** Frequency and amplitude proportional to speed
- **Frequency range:** up to 20 kHz • **Electrical:** Sine wave output, 850 Ohm, 135 mH
- **Module / DP Range:** M: 0.5 or larger / DP: 50 or coarser

| PICTURE                                                                           | TYPE          | HOUSING                                    | CONNECTION                         | MECHANICAL                                    |
|-----------------------------------------------------------------------------------|---------------|--------------------------------------------|------------------------------------|-----------------------------------------------|
|  | <b>E58HAM</b> | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin | Overall length: 61 mm<br>Thread length: 33 mm |

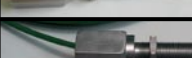
## DIGITAL ELECTROMAGNETIC SPEED SENSORS

- **Temperature rating:** -40...125°C • **Signal output:** Frequency proportional to speed • **Frequency range:** up to 20 kHz
- **Supply Voltage:** 5...32 VDC • **Electrical:** Square wave, NPN with 2.2 kOhm pull up
- **Module / DP Range:** M: 0.5 or larger / DP: 50 or coarser

| PICTURE                                                                             | TYPE            | HOUSING                                    | CONNECTION                            | MECHANICAL                                      |
|-------------------------------------------------------------------------------------|-----------------|--------------------------------------------|---------------------------------------|-------------------------------------------------|
|    | <b>EV58AM</b>   | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 61 mm<br>Thread length: 33 mm   |
|    | <b>EV58AM25</b> | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 92 mm<br>Thread length: 64 mm   |
|   | <b>EV58AM40</b> | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 130 mm<br>Thread length: 102 mm |
|  | <b>EV58S</b>    | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 69 mm<br>Thread length: 50 mm   |
|  | <b>EV58S25</b>  | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 83 mm<br>Thread length: 64 mm   |
|  | <b>EV58S40</b>  | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 121 mm<br>Thread length: 102 mm |

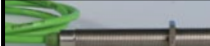
## VR ELECTROMAGNETIC SPEED SENSORS - EX ATEX Zone 1/ EX NA Class 1 Div 1

- **Temperature rating:** -40...125°C • **Signal output:** Frequency and amplitude proportional to speed
- **Frequency range:** up to 20 kHz • **Electrical:** Sine wave output, 250 Ohm, 70 mH coil
- **Module / DP Range:** M: 1.0 or larger / DP: 25 or coarser **CERTIFIED FOR USE IN EXPLOSIVE ATMOSPHERES**

| PICTURE                                                                             | TYPE           | HOUSING                                    | CONNECTION                      | MECHANICAL                                      |
|-------------------------------------------------------------------------------------|----------------|--------------------------------------------|---------------------------------|-------------------------------------------------|
|  | <b>EX58H</b>   | Threaded 5/8"- 18 UNF stainless steel IP67 | 1/2 - 14 NPT<br>Cable PTFE, 3 m | Overall length: 88 mm<br>Thread length: 48 mm   |
|  | <b>EX58H35</b> | Threaded 5/8"- 18 UNF stainless steel IP67 | 1/2 - 14 NPT<br>Cable PTFE, 3 m | Overall length: 129 mm<br>Thread length: 89 mm  |
|  | <b>EX58H85</b> | Threaded 5/8"- 18 UNF stainless steel IP67 | 1/2 - 14 NPT<br>Cable PTFE, 3 m | Overall length: 256 mm<br>Thread length: 216 mm |
|  | <b>EX34H</b>   | Threaded 3/4"- 20 UNF stainless steel IP67 | 1/2 - 14 NPT<br>Cable PTFE, 3 m | Overall length: 88 mm<br>Thread length: 48 mm   |
|  | <b>EX34H35</b> | Threaded 3/4"- 20 UNF stainless steel IP67 | 1/2 - 14 NPT<br>Cable PTFE, 3 m | Overall length: 120 mm<br>Thread length: 89 mm  |

## VR ELECTROMAGNETIC SPEED SENSORS - EX ATEX Zone 2/ EX NA Class 1 Div 2

- **Temperature rating:** -40...125°C • **Signal output:** Frequency and amplitude proportional to speed
- **Frequency range:** up to 20 kHz • **Electrical:** Sine wave output, 850 Ohm, 135 mH
- **Module / DP Range:** M: 0.5 or larger / DP: 50 or coarser **CERTIFIED FOR USE IN EXPLOSIVE ATMOSPHERES**

| PICTURE                                                                             | TYPE     | HOUSING                                    | CONNECTION                         | MECHANICAL                                      |
|-------------------------------------------------------------------------------------|----------|--------------------------------------------|------------------------------------|-------------------------------------------------|
|    | EX10A    | Threaded M10x1 stainless steel IP67        | Connector, M12x1, 4 pin, sealed    | Overall length: 48 mm<br>Thread length: 34 mm   |
|    | EX10S    | Threaded M10x1 stainless steel IP67        | Cable, PTFE, 3m 0.21 mm², AWG 24   | Overall length: 54 mm<br>Thread length: 34 mm   |
|    | EX12A    | Threaded M12x1 stainless steel IP67        | Connector, M12x1, 4 pin, sealed    | Overall length: 60 mm<br>Thread length: 40 mm   |
|    | EX12A35  | Threaded M12x1 stainless steel IP67        | Connector, M12x1, 4 pin, sealed    | Overall length: 109 mm<br>Thread length: 89 mm  |
|    | EX38A    | Threaded 3/8"- 24 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed    | Overall length: 48 mm<br>Thread length: 34 mm   |
|    | EX38S    | Threaded 3/8"- 24 UNF stainless steel IP67 | Cable, PTFE, 3m 0.21 mm², AWG 24   | Overall length: 54 mm<br>Thread length: 34 mm   |
|    | EX58AM   | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin | Overall length: 61 mm<br>Thread length: 33 mm   |
|   | EX58AM25 | Threaded 5/8"- 24 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin | Overall length: 92 mm<br>Thread length: 64 mm   |
|  | EX58AM40 | Threaded 5/8"- 24 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin | Overall length: 130 mm<br>Thread length: 102 mm |
|  | EX58S    | Threaded 5/8"- 24 UNF stainless steel IP67 | Cable, PTFE, 3 m, 0.21 mm², AWG 24 | Overall length: 69 mm<br>Thread length: 50 mm   |
|  | EX58S25  | Threaded 5/8"- 24 UNF stainless steel IP67 | Cable, PTFE, 3 m, 0.21 mm², AWG 24 | Overall length: 83 mm<br>Thread length: 64 mm   |
|  | EX58S40  | Threaded 5/8"- 24 UNF stainless steel IP67 | Cable, PTFE, 3 m, 0.21 mm², AWG 24 | Overall length: 121 mm<br>Thread length: 102 mm |



## DIFFERENTIAL HALL EFFECT SPEED SENSORS

- **Temperature rating:** -40...125°C • **Signal output:** Frequency proportional to speed
- **Frequency range:** 5 Hz to 20 kHz • **Supply Voltage:** 8...32 VDC
- **Electrical:** Square wave push-pull output • **Module / DP Range:** M: 0.5 or larger / DP: 50 or coarser

| PICTURE                                                                           | TYPE | HOUSING                             | CONNECTION                                                                  | MECHANICAL                                     |
|-----------------------------------------------------------------------------------|------|-------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------|
|  | D12A | Smooth 10.8 mm OD flange mount IP67 | Connector, M12x1, 4 pin, sealed                                             | Overall length: 60 mm<br>Shaft length: 25.7 mm |
|  | D12P | Threaded M12x1 stainless steel IP67 | Cu cable insulation PTFE, 0.35 m, 0.21 mm², AWG 24 with connector 3 pin AMP | Overall length: 69 mm<br>Thread length: 50 mm  |

## DUAL CHANNEL HALL EFFECT SPEED AND DIRECTION SENSORS

- **Temperature rating:** -40...125°C • **Signal output:** Frequency proportional to speed (channel 1) and direction (ch 2)
- **Frequency range:** 0 Hz to 15 kHz • **Supply Voltage:** 8...32 VDC
- **Electrical:** Square wave output, NPN plus direction line • **Module / DP Range:** M: 1.0 or larger / DP: 25 or coarser

| PICTURE                                                                            | TYPE  | HOUSING                                    | CONNECTION                      | MECHANICAL                                   |
|------------------------------------------------------------------------------------|-------|--------------------------------------------|---------------------------------|----------------------------------------------|
|  | Y12AD | Threaded M12x1 with O-ring and locator key | Connector, M12x1, 4 pin, sealed | Overall length: 75 mm<br>Shaft length: 36 mm |

## ZERO SPEED HALL EFFECT SPEED SENSORS

- **Temperature rating:** -40...125°C • **Signal output:** Frequency proportional to speed
- **Frequency range:** 0 Hz to 15 kHz • **Supply Voltage:** 8...25 VDC
- **Electrical:** Square wave, NPN with 2.7 Ohm pull up • **Module / DP Range:** M: 1.0 or larger / DP: 25 or coarser

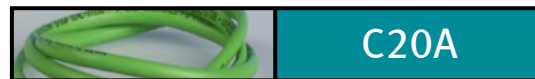
| PICTURE                                                                             | TYPE   | HOUSING                               | CONNECTION                            | MECHANICAL                                      |
|-------------------------------------------------------------------------------------|--------|---------------------------------------|---------------------------------------|-------------------------------------------------|
|  | F12A   | Threaded M12x1 stainless steel IP67   | Connector, M12x1, 4 pin, sealed       | Overall length: 60 mm<br>Thread length: 40 mm   |
|  | F12S   | Threaded M12x1 stainless steel IP67   | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 69 mm<br>Thread length: 50 mm   |
|  | F16A   | Threaded M16x1.5 stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 60mm<br>Thread length: 40mm     |
|  | F16A25 | Threaded M16x1.5 stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 84 mm<br>Thread length: 64 mm   |
|  | F16A40 | Threaded M16x1.5 stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 121 mm<br>Thread length: 102 mm |
|  | F16S   | Threaded M16x1.5 stainless steel IP67 | Cable, Silicone, 1m 0.34 mm², AWG 22  | Overall length: 69 mm<br>Thread length: 50 mm   |
|  | F16S25 | Threaded M16x1.5 stainless steel IP67 | Cable, Silicone, 1m 0.34 mm², AWG 22  | Overall length: 83 mm<br>Thread length: 64 mm   |
|  | F16S40 | Threaded M16x1.5 stainless steel IP67 | Cable, Silicone, 1m 0.34 mm², AWG 22  | Overall length: 121 mm<br>Thread length: 102 mm |

## ZERO SPEED HALL EFFECT SPEED SENSORS - continued

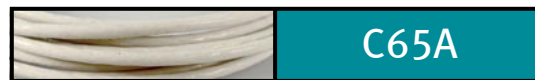
- **Temperature rating:** -40...125°C • **Signal output:** Frequency proportional to speed
- **Frequency range:** 0 Hz to 15 kHz • **Supply Voltage:** 8...25 VDC
- **Electrical:** Square wave, NPN with 2.7 Ohm pull up • **Module / DP Range:** M: 1.0 or larger / DP: 25 or coarser

| PICTURE                                                                             | TYPE    | HOUSING                                    | CONNECTION                            | MECHANICAL                                      |
|-------------------------------------------------------------------------------------|---------|--------------------------------------------|---------------------------------------|-------------------------------------------------|
|    | F58A    | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 60 mm<br>Thread length: 40 mm   |
|    | F58A25  | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 84 mm<br>Thread length: 64 mm   |
|    | F58A40  | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, M12x1, 4 pin, sealed       | Overall length: 121 mm<br>Thread length: 102 mm |
|    | F58AM   | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 61 mm<br>Thread length: 33 mm   |
|    | F58AM25 | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 92 mm<br>Thread length: 64 mm   |
|    | F58AM40 | Threaded 5/8"- 18 UNF stainless steel IP67 | Connector, MS 3102A-10SL-4P, 2 pin    | Overall length: 130 mm<br>Thread length: 102 mm |
|    | F58S    | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1m 0.34 mm², AWG 22  | Overall length: 69 mm<br>Thread length: 50 mm   |
|   | F58S25  | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 83 mm<br>Thread length: 60 mm   |
|  | F58S40  | Threaded 5/8"- 18 UNF stainless steel IP67 | Cable, silicone, 1 m 0.34 mm², AWG 22 | Overall length: 121 mm<br>Thread length: 102 mm |

## MATING CABLE ASSEMBLY for all sensors with M12x1 connector



- **Material:** PU (poly-urethane) • **Length:** 2 m • **Color:** Green • **Temperature rating:** -20...85°C
- **Connector:** M12 standard, overmoulded. Pin 1 = brown, Pin 2 = white, Pin 3 = blue, Pin 4 = black



- **Material:** PTFE • **Length:** 6.5 m • **Color:** White • **Temperature rating:** Cable -40...260°C / Connector -30...90°C
- **Connector:** M12 standard, overmoulded. Pin 1 = red, Pin 2 = black, Pin 3 = brown, Pin 4 = yellow

## Complete measurement chain by JAQUET

### JAQUET speed sensors - OEM or customized



JAQUET speed sensors are designed to endure the most demanding ambient conditions and are used in a multitude of applications e.g. turbochargers, hydraulic motors, diesel and gas engines, turbines, pumps and compressors, just to name a few. Our platform approach enables us to take an appropriate sensing technology and package it in either one of our huge array of existing housings or in something matched to your specific requirements.

Need a high temperature helicopter turbine sensor or a railway traction control sensor that delivers tooth frequency x 16 from the first tooth? Consider it done! We are ready for the next challenge.

### JAQUET pole wheels and pole bands



JAQUET pole wheels and pole bands represent the highest quality of target technology and complement the chain of speed measurement. Please refer to the pole wheels and pole bands brochure for further information.

### JAQUET systems



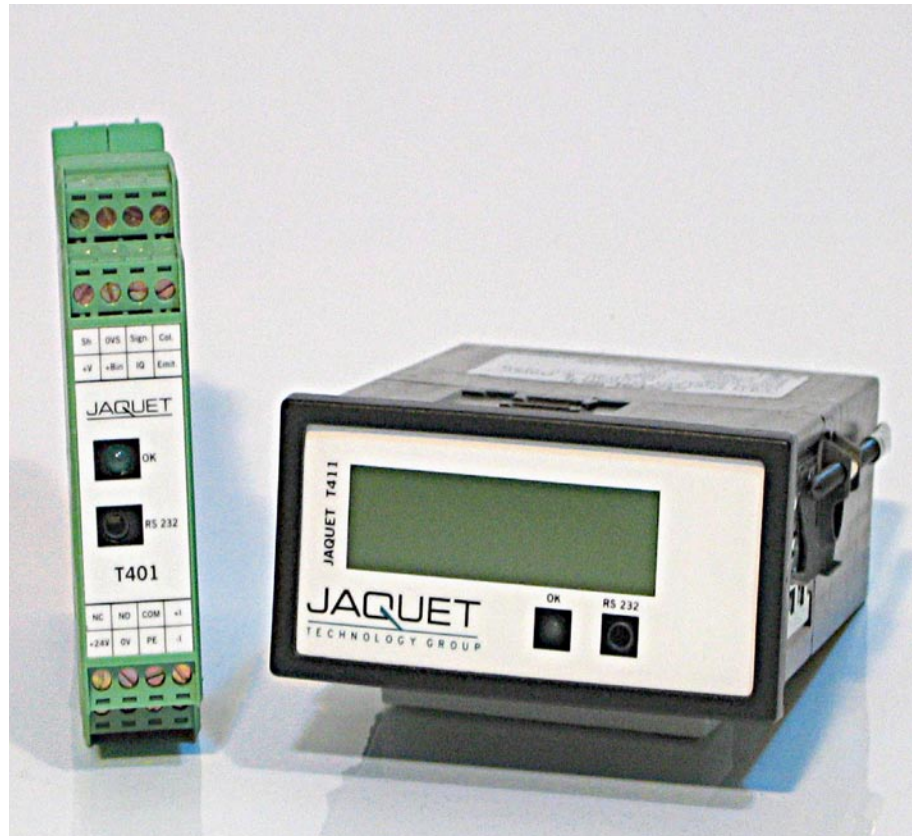
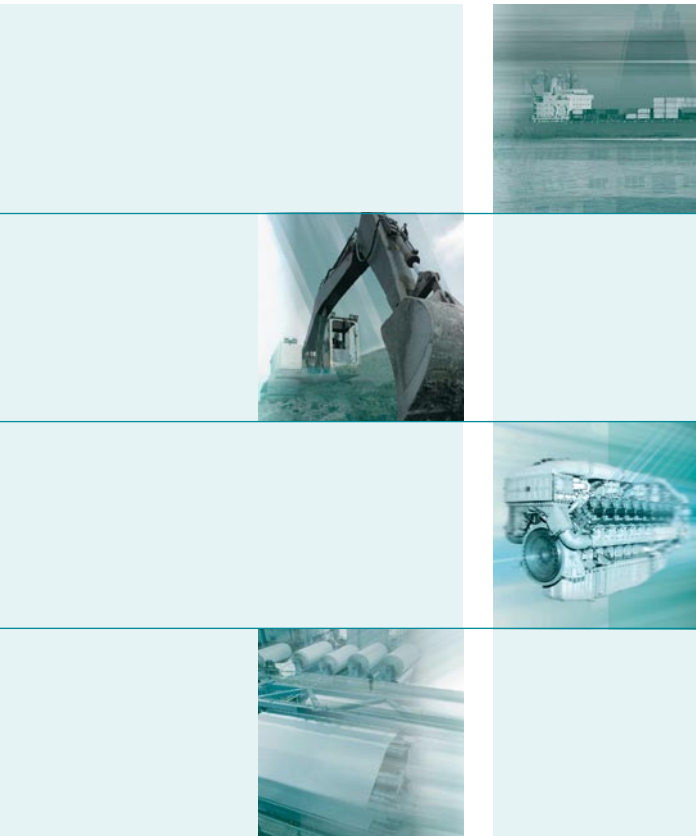
From hydro electric power stations high in the Pyrenees to nuclear submarines at the bottom of the ocean, JAQUET tachometer products are in service providing optimum solutions for measurement, control and that all important machine protection function.

Find more information about the JAQUET T400 family in the following chapter of this brochure.

### JAQUET Handheld tachometers



To complete our speed measurement portfolio - JAQUET also offers handheld tachometers. For more information about these products, please take a look at the last section of this brochure.



## JAQUET T400 Speed measurement, switching and indicating instruments

### 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 approval for marine applications
- Digital display of speed value for the models T411 and T412
- 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
- 2 possible relay configuration sets e.g. for start up bridging, controlled via binary inputs
- Pluggable terminals - programmable measurement & analog output filter times
- Integrated 2 or 3 wire sensor monitoring and system watchdog

### TYPICAL APPLICATIONS

Diesel engine start control and overspeed protection

Micro turbine measurement and protection

Turbocharger speed measurement

Machine protection in safety critical applications

Universal speed measurement and indication



**One channel tachometer with relay and 0/4-20 mA output:**

|                                        |                            |
|----------------------------------------|----------------------------|
| Type number: T401 (without display)    | Product number: 383Z-05307 |
| Type number: T401 S5 (without display) | Product number: 383Z-05671 |
| Type number: T411 (with display)       | Product number: 383Z-05318 |
| Type number: T411 S5 (with display)    | Product number: 383Z-05595 |

**One channel tachometer with relay and 0/2-10 V output:**

|                                        |                            |
|----------------------------------------|----------------------------|
| Type number: T402 (without display)    | Product number: 383Z-05308 |
| Type number: T402 S5 (without display) | Product number: 383Z-05672 |
| Type number: T412 (with display)       | Product number: 383Z-05319 |
| Type number: T412 S5 (with display)    | Product number: 383Z-05596 |


**Technical Data**

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Measuring range</b>           | Lowest: 0...1.000 Hz<br>Highest: 0...35.00 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Accuracy</b>                  | 0.5% referred to the analog output end of range value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Analog output</b>             | <p>T401/T411: Current output 0...20 mA resp. 4...20 mA T402/T412: Voltage output 0...10 V resp. 2...10 V</p> <p>Programmable rising or falling transfer function (min. end value 1.00 Hz)</p> <p>Load T401: max. 500 Ohms corresponding to a maximum of 10 V</p> <p>Load T402: min. 7 kOhm corresponding to a maximum of 1.4 mA</p> <p>Maximum open circuit voltage: 12 V</p> <p>Resolution: 12 bit corresponding to 1:4096</p> <p>Maximum linearity error: 0.1 %</p> <p>Temperature drift: typ. <math>\pm 100</math> ppm/degree K, max. <math>\pm 300</math> ppm/degree K</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Set points /relay</b>         | <p>Range: See measuring range above</p> <p>Hysteresis: For each limit an upper and a lower set point may be set independently</p> <p>Change over contact: max. 250 VAC, 1250 VA (DC: see operating instructions)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Data I/O</b>                  | (Serial EIA) RS232 interface with +5 V-CMOS level 3-pole, 3.5 mm stereo headphone connector on the front side, common reference potential with negative pole of sensor supply.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Measuring / response time</b> | <p>The min. measuring time (fix-time) is programmable: 2/5/10/20/50/100/200/500 ms, 1/2/5 s</p> <p>For input frequencies with a period SHORTER than the fix-time:</p> <p><i>Analog output:</i></p> <ul style="list-style-type: none"> <li>- Maximum: <math>2 \times \text{fix time} + \text{max. period of the input frequency} + 7.5 \text{ ms}</math></li> <li>- Typical: <math>\text{fix time} + 1 \text{ period of the input frequency} + 7.5 \text{ ms}</math></li> </ul> <p><i>Relay:</i></p> <ul style="list-style-type: none"> <li>- Maximum: <math>2 \times \text{fix time} + \text{max. period of the input frequency} + 10.5 \text{ ms}</math></li> <li>- Typical: <math>\text{fix time} + 1 \text{ period of the input frequency} + 10.5 \text{ ms}</math></li> </ul> <p>For input frequencies with a period LONGER than the fix time:</p> <p><i>Analog output:</i></p> <ul style="list-style-type: none"> <li>- Maximum: <math>\text{Period of the input frequency} + 7.5 \text{ ms}</math></li> </ul> <p><i>Relay:</i></p> <ul style="list-style-type: none"> <li>- Maximum: <math>\text{Period of the input frequency} + 10.5 \text{ ms}</math></li> </ul> |
| <b>Sensor input</b>              | <p>Input resistance: 30 kOhm</p> <p>Frequency range: (-3 dB): 0.01 Hz / 35 kHz</p> <p>Trigger level: adaptive trigger level from 20 mV to 5 V or 500 mV to 5 V (factory configuration) peak depending on the amplitude of the input signal</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Sensor supply</b>             | <p>Built-in sensor power supply: +14 V, max. 35 mA, short-circuit proof / +5 V for S5 versions</p> <p>Built-in pull up (+14 V / +5 V) and pull down (0 V) resistor 820 Ohm for connection of two-wire transmitters or daisy chaining of T400's</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Sensor monitoring</b>         | <p>Powered 2 and 3 wire sensors: min. and max. current consumption values are selectable in the range 0.5...25 mA. Sensors with consumption below min. or above max. current will be signalled as defective.</p> <p>Electromagnetic/VR sensors: Open circuit state of sensors. This supervision runs permanently. Both monitoring functions can be switched off via the configuration software.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Open collector output</b>     | Galvanically separated output of sensor frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |


**AGT**

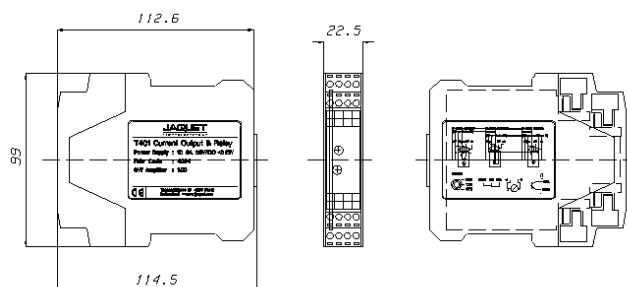
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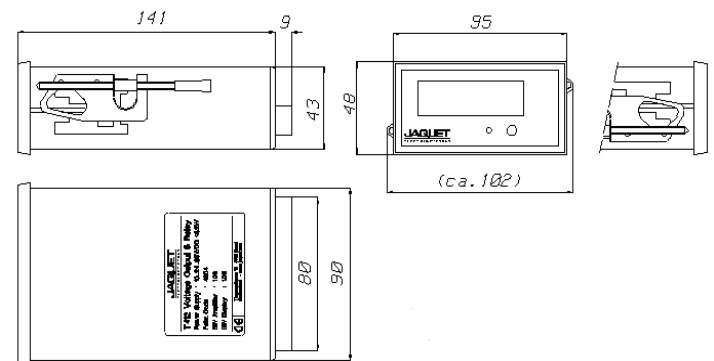
[www.jaquet.com](http://www.jaquet.com)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Binary inputs</b> | For external selection between two sets (A/B) of programmable relay control and acknowledge functions: (No external pull up needed)<br><br>Low active :U < +1.5 V      High (open) :U > +3.5 V                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Environmental</b> | KUE according to DIN 40 040<br><br>Operating temperature: - 40...+85 °C<br><br>Storage temperature: -40...+90 °C<br><br>Relative humidity up to 75% average over one year period, up to 90% max. for 30 days                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Power supply</b>  | 10...36 VDC power consumption max. 3 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Insulation</b>    | Galvanic separation between power supply, current output and the sensor power supply. Isolation 700 VDC / 500 VAC. Relay contact isolation: 1500 AC                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>EMC</b>           | Electromagnetic compatibility: Radiation in accordance with international standards and EN 50081-2. Immunity in accordance with international standards and EN 50082-2<br><br>Conducted emissions: CISPR 16-1, 16-2      Radiated emissions: EN 55011<br><br>Electrostatic discharge: IEC 61000-4-2      Electromagnetic fields: IEC 61000-4-3<br><br>Conducted fast transients: IEC 61000-4-4      Conducted slow transients: IEC 61000-4-5<br><br>Conducted high frequency: IEC 61000-4-6<br><br>Pulse modul. elec. field: ENV 50140<br><br>Power frequency magnetic field: IEC 1000-4-8 |
| <b>Standards</b>     | EN 50155<br><br>GL / Germanischer Lloyd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

### Dimensions: T401/T402



### T411/T412



|                  |                                                                    |
|------------------|--------------------------------------------------------------------|
| <b>Rail</b>      | Rail DIN 4622713 (EN 50022) or mounting plate to DIN 43660 (46121) |
| <b>Housing</b>   | Protection class IP40, terminals IP20                              |
| <b>Terminals</b> | See operating instructions                                         |
| <b>Weight</b>    | T401/T402: 150 g    T411/T412: 210 g                               |

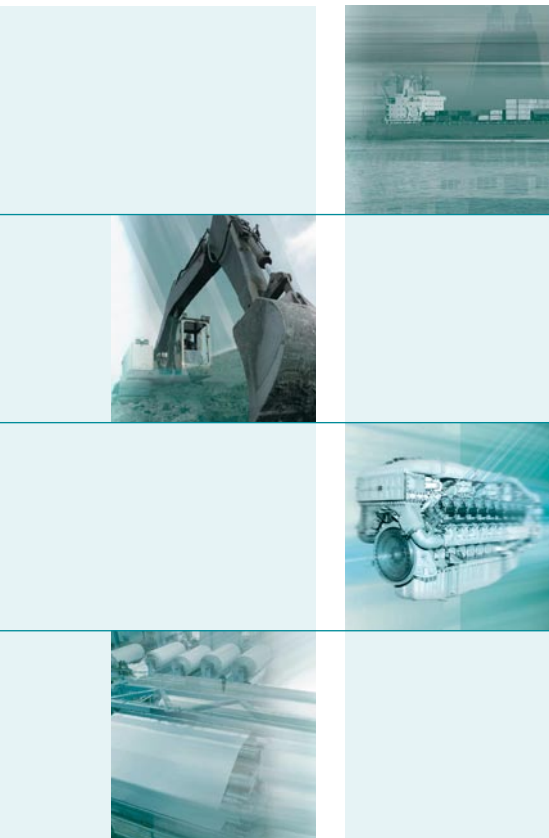
Full technical details can be seen in the operating instructions.

T401/T402 and T411/T412 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.



## JAQUET Handheld tachometers - HO 100, HM 100 and HC 100

### TYPE AND PRODUCT NUMBERS

#### OPTICAL HAND TACHOMETER

Type number: HO 100  
Product number: 372Z-05668

#### CONTACT HAND TACHOMETER

Type number: HM 100  
Product number: 372Z-05669

#### COMBINATION SET

Type number: HC 100  
Product number: 372Z-05670

**JAQUET HO 100 Optical Tachometer** uses precision optics and reflective tape to measure the RPM of rotating devices such as fans and gears.

**JAQUET HM 100 Contact Tachometer** uses convex and concave attachments to measure RPM. It also has a built-in wheel to measure the linear surface speed of moving devices such as conveyors and treadmills.

### General specifications

|                           |                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------|
| Display                   | 5-digit LCD display                                                                   |
| Range selection           | Automatic range selection                                                             |
| Time base                 | 4 MHz quartz crystal                                                                  |
| Sampling time             | 1 second (> 60 rpm);<br>> 1 second (10 to 60 rpm)                                     |
| Photo tachometer distance | 2 to 12" (5 to 30 cm)                                                                 |
| Operating temperature     | 0...50 °C (32...122 °F)                                                               |
| Operating humidity        | 80% RH max.                                                                           |
| Power supply              | 9 V battery                                                                           |
| Battery life              | 40 hours (approx.)                                                                    |
| Applicable standards      | HO 100: EN 50081-1/1992 (EN 55022)<br>HM 100: EN 50082-1/1997 (EN 55024)              |
| Dimensions                | HO 100: 124 x 51 x 33 mm<br>HM 100: 150 x 51 x 33 mm<br>HO 100: 114 g / HM 100: 142 g |
| Weight                    |                                                                                       |

### Range specifications

| Measurement                    | Range                  | Accuracy                    |
|--------------------------------|------------------------|-----------------------------|
| Rotation - HO 100 Optical      | 10.000 to 99999 rpm    | ± (0.1% reading + 2 digits) |
| Rotation - HM 100 Contact      | 10.000 to 9999 rpm     | ± (0.1% reading + 2 digits) |
| Surface Speed - HM 100 Contact | 1.0000 to 1999.9 m/min | ± (1.5% reading + 2digits)  |



JAUQUET TECHNOLOGY GROUP offers the world's most versatile and advanced range of solutions for the detection, measurement, diagnosis and management of rotational speed. 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.

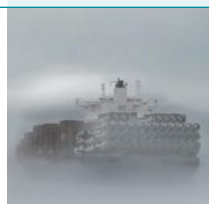
#### TYPICAL INDUSTRIES SERVED

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



#### PRODUCTS – SPEED SENSORS

- Various technologies
- Standard, custom and OEM models
- 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



#### JAUQUET – YOUR PARTNER

- Efficient and professional service - JAUQUET TECHNOLOGY GROUP is headquartered in Basel, Switzerland and has subsidiaries in Belgium, China, Germany, the Netherlands, United Kingdom and United States along with a worldwide distributor and end-user service network.
- Flexible production quantities; from 1 to millions per project
- Reduction of total costs by intelligent and cost-effective solutions
- Fast turn around time

