Turbine Wheel Flowmeter

Plastic Model for Liquids

measuring • monitoring • analyzing

TUR

TUR with Transmitter

TUR with ADI-1 Electronics

TUR with Compact Electronics

- Measuring Ranges: 5.3...88 GPM or 11...440 GPM (Water)
- Measuring Accuracy: ±1% of Full Scale
- p_{max}: 145 PSIG; t_{max}: 158 °F
- Process Connection: 2" or 4" 150lb ANSI Flanges
- Body Material: PVC or PVDF
- Output: Pulse Frequency, 4 - 20 mA, or 0-10V, LED Display, Switching Outputs, Batching, or Totalizers

Order from: C A Briggs Company

622 Mary Street; Suite 101; Warminster, PA 18974

Phone: 267-673-8117 - Fax: 267-673-8118

Sales@cabriggs.com - www.cabriggs.com

KOBOLD Instruments, Inc.
1801 Parkway View Drive
Pittsburgh, PA 15205

01/6-21-2018

Description

TUR turbine wheel flowmeters are used for measurement and control of water and compatible, water-based medias. Engineered from chemically resistant materials, they are compatible with many acidic, basic, and aggressive water-based medias commonly found throughout the industrial process industry.

The TUR is comprised of the following:

Body

Material: PVC or PVDF
Connection: 150# ANSI Flange 2" or 4" PVC

Pulse Frequency Pickup

PNP (24 V_{DC}, I_{max} 400 mA)
NPN (24 V_{DC}, I_{max} 400 mA)

Transmitter (Optional)

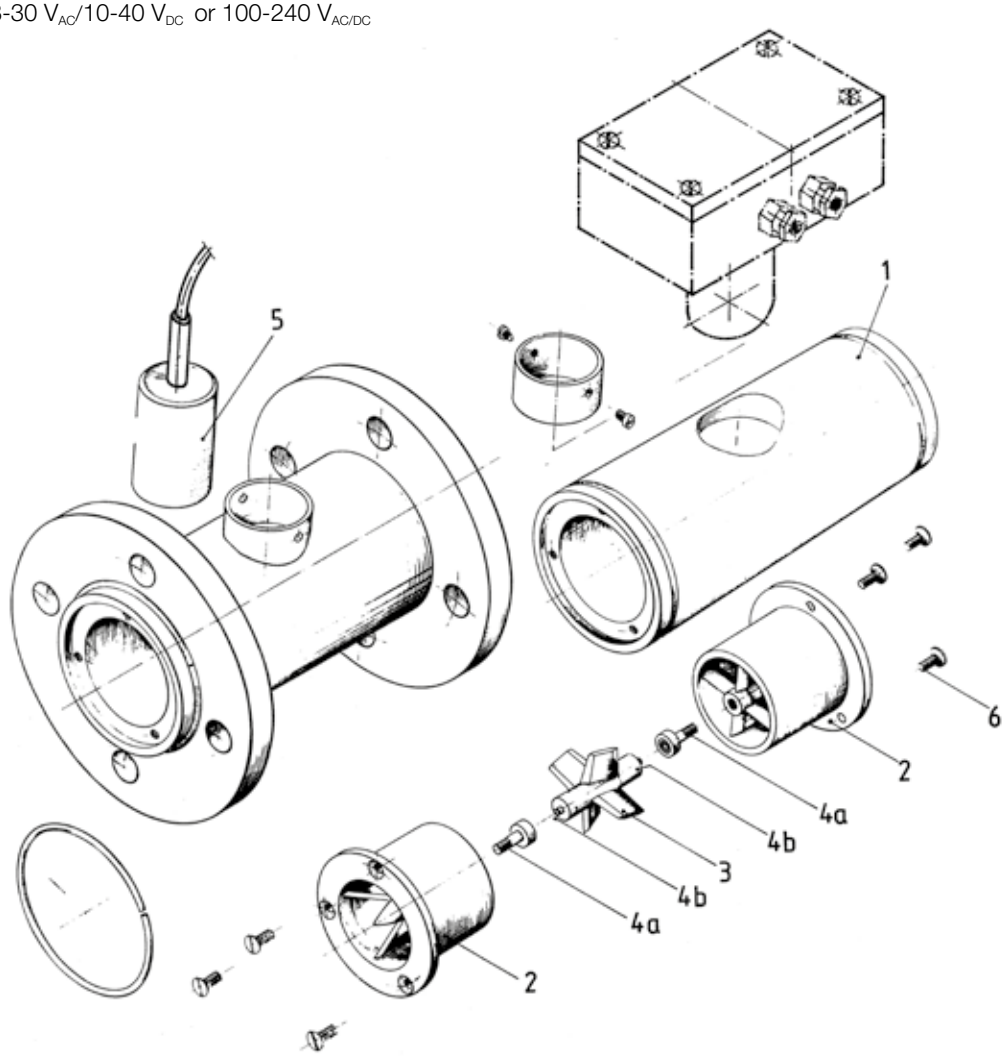
Outputs: 4-20 mA, or 0-10 V
Supply: 24 V_{DC}, or 115 V_{AC}

Display/Transmitter (Optional)

Outputs: 4-20 mA or 0-10 V
PNP/NPN Switches, 2 SPDT Relays
Supply: 24 V_{DC}, 18-30 V_{AC}/10-40 V_{DC} or 100-240 $V_{AC/DC}$

Principle of Operation

The body is comprised of a thick-walled plastic pipe with (1) a rotatable PVC flange secured at each end. Bearing cross bars (2) which ensure steady flow, are fitted into both the inlet and outlet. A turbine wheel (3), with steel slugs cast-in at each end, rotates as a result of the media flow. The metal slugs are protected against corrosion as they do not come into contact with the media. The sapphire bearings (4a) are fitted in the bearing cross bars. The bearing axle, made of highly chemically-resistant tungsten-carbide, is cast into the turbine wheel. The rotation of the turbine wheel is picked up by a top-mounted pulse generator (5) without seals and is mechanically non-interacting, and transferred to the evaluating electronics as pulses. The evaluating electronics convert the pulse signal into a flow rate display, limit contacts and/or analog output.



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Technical Details

Measuring Accuracy: ±1% of Full Scale
Media: Water and Compatible, Water-Based Solutions
Max. Media Temperature: PVC Version: 140 °F (60 °C)
PVDF Version: 158 °F (70 °C)
Max. Pressure: 145 PSIG
Pressure Drop: Approx. 1.5 PSIG at Max. Flow
Protection Type: IP 65

Materials

Component	PVC Model	PVDF Model
(1) Fitting	PVC	PVDF
(2) Bearing Cross Bars	PVC	PVDF
(3) Turbine Wheel	PVC	PVDF
(4a) Bearing Bush	Sapphire	Sapphire
(4b) Bearing Axle	Sapphire	Sapphire
(6) Bolts	Polyamide	PVDF
(7) Flange	PVC	PVC

Electronics

- **Frequency Output**
  - **Power Supply:** 24 V_{DC} ± 20%
  - **Idle Current:** 15 mA (nominal)
  - **Pulse Output:** PNP or NPN, Max. 400 mA
  - **Electrical Conn:** 6.5' (2 m) PVC Cable

- **Transmitter**
  - **Power Supply:** 115 V_{AC}, 24 V_{DC}
  - **Output:** 4-20 mA or 0-10 V_{DC} 4-wire
  - **Max. Load:** 500 Ω
  - **Electrical Conn:** Connection Box with Cable Gland

- **Compact Electronics**
  - **Display:** 3-Segment LED Rate
  - **Analog Output:** 4... 20 mA Adjustable, Max. Load: 500 Ω
  - **Switching Outputs:** 1 or 2 PNP or NPN Semiconductor
  - **Contact Operation:** N/C N/O Programmable
  - **Programming:** via 2 Buttons
  - **Power Supply:** 24 V_{DC} ±20%, 3-wire, Approx. 100 mA
  - **Electrical Conn:** Plug Connector M12x1

Totalizing Electronic

Display: LCD, 2 x 8 Digits, Illuminated Rate, Total and Grand Total, Units Selectable
Analog Output: 4-20 mA Adjustable
Load: Max. 500 Ω
Switching Output: Relay (2x), Max. 30 V/2 A, 60 VA
Settings: Via 4 Buttons
Functions: Reset, MIN/MAX Memory, Flow Rate, Total and Grand Total, Language
Power Supply: 24 V_{DC} ±20%, 3-wire
Power Consumption: Approx. 170 mA
Electrical Connection: Cable Connection or M12x1 Plug

Batching Electronic

Display: LCD, 2 x 8 Digits, Illuminated Batching, Total and Grand Total, Units Selectable
Analog Output: 4-20 mA, Adjustable
Load: Max. 500 Ω
Switching Output: Relay (2x), Max. 30 V/2 A, 60 VA
Settings: Via 4 Buttons
Functions: Batching (Relay S2), Start, Stop, Reset, Fine Batching, Correction Amount, Flow Switch, Total Quantity, Language
Power Supply: 24 V_{DC} ±20%, 3-wire
Power Consumption: Approx. 170 mA
Electrical Connection: Cable Connection or M12 Plug

- **ADI-1 Electronics***
  - **Display:** Bar Graph and 5-Digit LED Display
  - **Analog Output:** 4...20 mA, 0-10 V_{DC}
  - **Switching Outputs:** Relay/SPDT (Changeover) Contact, Max. 250 V_{AC}/5 A Resistive Load, Max. 30 V_{DC} / 5 A
  - **Setting:** Via 4 Buttons
  - **Power Supply:** 100 ... 240 V_{AC} ± 10 % or 18 ... 30 V_{AC} /10 ... 40 V_{DC}
  - **Electrical Conn:** Pluggable Terminal Block via Cable Gland

**For more technical details on the ADI-1 electronic indicator, please see datasheet ADI-1.*

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Order Details: (Example: **TUR-3 0 50 N**)

Model	Output	Body Material	Connection/ Measuring Range	Electronics
TUR-	**..3..** = Blind Pulse	**..0..** = PVC **..1..** = PVDF	**..50..** = 2" 150lb ANSI Flange 5.3...88 GPM **..10..** = 4" 150lb ANSI Flange 11...440 GPM	**..N** = NPN, 24 V_{DC}, 3-wire **..P** = PNP, 24 V_{DC}, 3-wire
	..4.. = Blind Analog or Evaluating Display Electronic	**..0..** = PVC **..1..** = PVDF	**..50..** = 2" 150lb ANSI Flange 5.3...88 GPM **..10..** = 4" 150lb ANSI Flange 11...440 GPM	**Blind Transmitter** **..M140** = 115 V_{AC}, 4-20 mA, 4-wire **..M110** = 115 V_{AC}, 0-10 V_{DC}, 4-wire **..M340** = 24 V_{DC}, 4-20 mA, 4-wire **..M310** = 24 V_{DC}, 0-10 V_{DC}, 4-wire **Compact Electronics*** **..C30R** = 2x Open Collector, PNP **..C30M** = 2x Open Collector **..C34P** = 4-20 mA, 1x Open Collector, PNP **..C34N** = 4-20 mA, 1x Open Collector NPN **Totalizer Electronics*** **..E34R** = 24 V_{DC}, 4-20 mA **..E31R** = 24 V_{DC}, 0-10 V **..E04R** = 90-250 V_{AC}, 4-20 mA **..E01R** = 90-250 V_{AC}, 0-10 V **Batching Electronics*** **..G34R** = 24 V_{DC}, 4-20 mA **..G31R** = 24 V_{DC}, 0-10 **..G04R** = 90-250 V_{AC}, 4-20 m **..G01R** = 90-250 V_{AC}, 0-10 V **ADI-1 Electronics*** **..K002** = 100-240 $V_{AC/DC}$, 2 SPDT Relay Contacts **..K042** = 100-240 $V_{AC/DC}$, 4-20 mA, 0-10 $V_{DC,}$ 2x SPDT Relay **..K302** = 18-30 V_{AC}, 10-40 V_{DC}, 2 SPDT Relay Contacts **..K342** = 18-30 V_{AC}, 10-40 V_{DC}, 4-20 mA, 0-10 $V_{DC,}$ 2x SPDT Relay

* Please specify flow direction in writing

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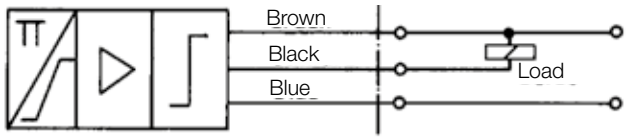
TUR-3... with Frequency Output

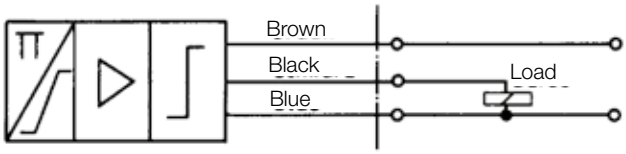
TUR-4... with Integrated Converter

Electrical Connection Diagrams

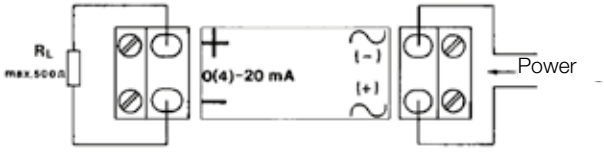
NPN TUR-3...N



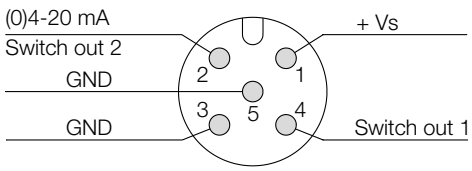
PNP TUR-3...P



Transmitter TUR-4...M...



TUR-4...C...



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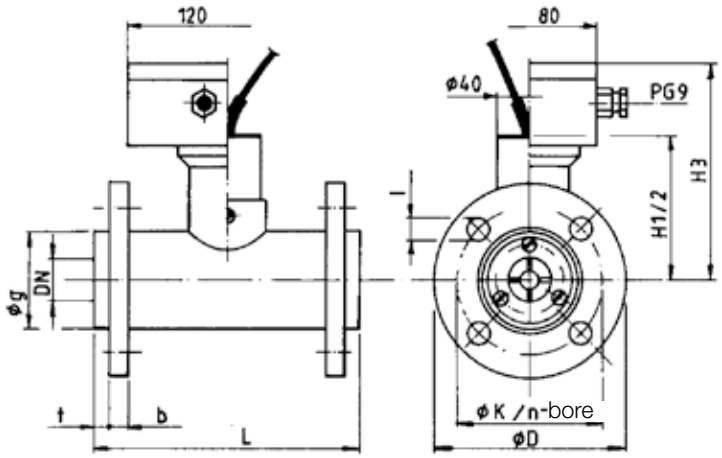
TUR with Blind Transmitters

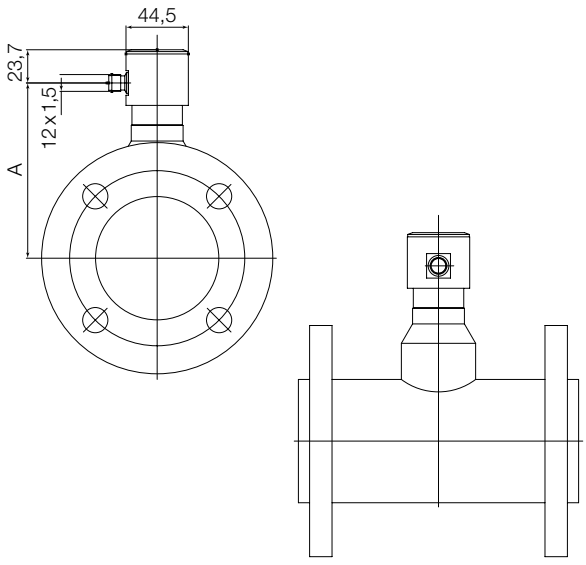


Flange Size	b	D	g	H2*	H3	K	L	n	l	t
2"	20	165	88	100	140	125	200	4x	18	11
4"	22	220	145	125	165	180	250	8x	18	11

* with NPN- or PNP sensor

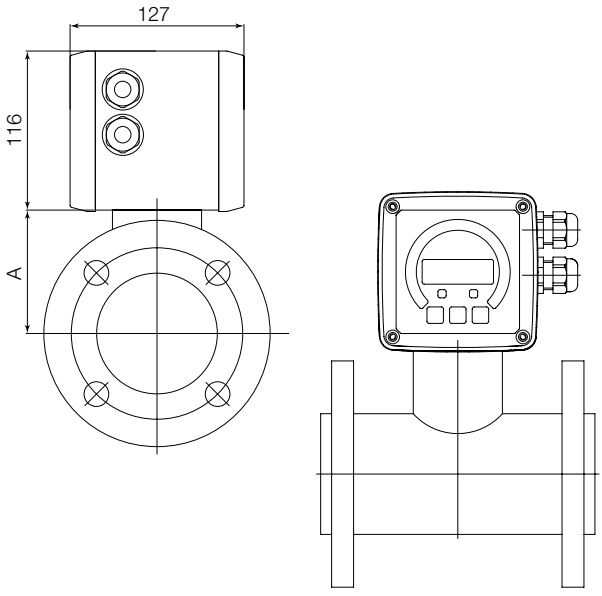
Dimensions (mm)

TUR with Compact Electronics



Model	Dimension A
TUR-..50	125
TUR-..10	150

TUR with ADI-1, Gxxx, Exxx or Electronics



Model	Dimension A
TUR-..50	90
TUR-..10	115

Dimensions (mm)

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