Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Turbine Wheel Flowmeter

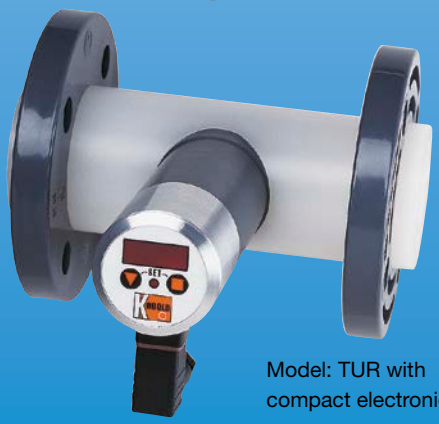
plastic version for liquids

measuring • monitoring • analysing

TUR

Model: TUR
with transmitter

Model: TUR with
ADI electronics



Model: TUR with
compact electronics

- Measuring ranges:
  0.2 - 5.0 ... 2.5 - 100,0 m^3/h water
- Measuring accuracy:
  ± 1% of full scale
- p_{max}: 10 bar; t_{max}: 70 °C
- Viscosity range: low viscosity
- Connection:
  flange DN 25 ... DN 100
- Material: PVC, PVDF
- Output: pulses,
  0 - 20 mA, 4 - 20 mA or 0 - 10 V,
  LED display, switching output

S4

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Service

The flowmeters with turbine wheel serve to measure, control and regulate flowing liquids. The use of chemically highly resistant materials allows the devices to be used with acids, bases and aggressive media that are to be found in the chemical industry.

Design

A flow measurement system comprises:

1 Fitting

Material: PVC or PVDF
Connection: flange NW 25, 50, 80 or 100

2a Pulse generator

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

2b Transmitter (option)

Output: 0 - 20 mA, 4 - 20 mA or 0 - 10 V
Supply: 24 V_{DC}, 24 V_{AC} or 230 V_{AC}

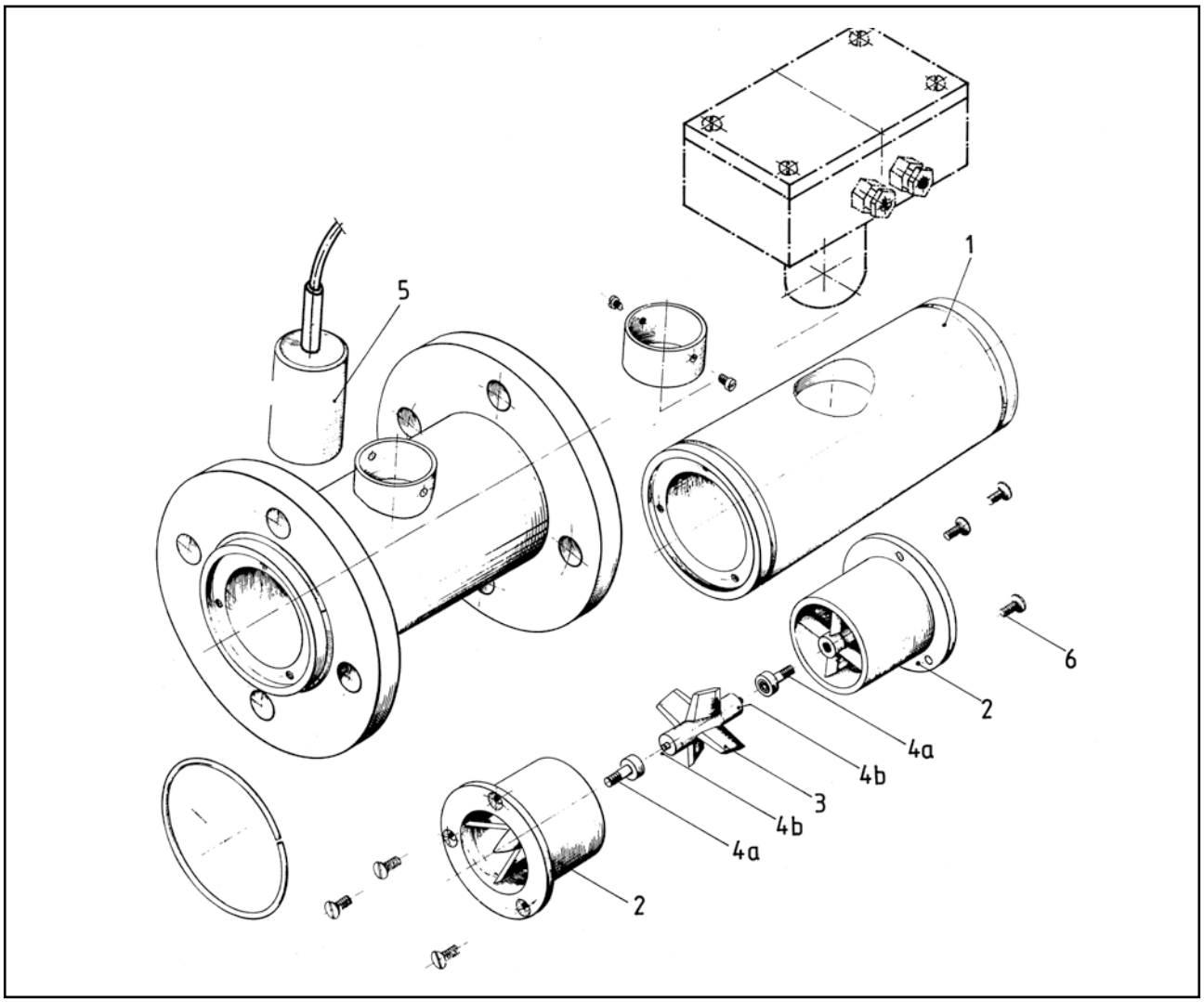
Method of Operation

The unit comprises a thick-walled plastic pipe (1); rotatable PVC flanges are secured at each end.

Bearing cross bars (2), which ensure steady flow, are fitted in inlet and outlet. A turbine wheel (3) with cast-in mild steel pieces at each end rotates smoothly depending on the flow rate. The metal parts do not come into contact with the medium and are therefore protected against corrosion. The sapphire bearing bushes (4a) are fitted in the bearing cross bars and are adjustable.

The bearing axle made of chemically highly resistant tungsten-carbide is cast into the turbine wheel. The rotation is picked off by a top-mounted pulse generator (5) without seals and mechanically non-interacting, and transferred to the evaluating electronics as impulses.

The evaluating electronics converts the pulse signal into a display, limit contacts, analogue output, or counts the quantity of liquid flow.



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Technical Details

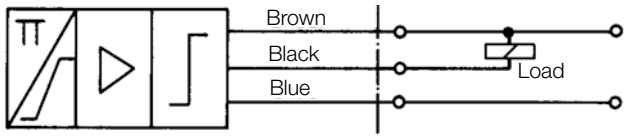
Measuring accuracy:	±1% of full scale
Viscosity range:	for low-viscosity media
Max. operating temperature:	60 °C (PVC version) 70 °C (PVDF version)
Max. operating pressure:	PN 10
Protection type:	IP 65

Materials

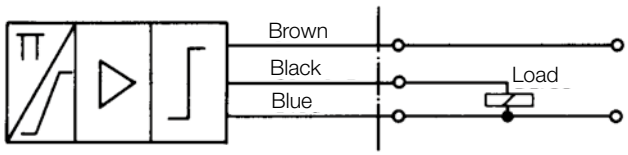
	PVC version	PVDF version
(1) Fitting	PVC	PVDF
(2) Bearing cross bars	PVC	PVDF
(3) Turbine wheel	PVC	PVDF
(4a) Bearing bush	sapphire	sapphire
(4b) Bearing axle	sapphire	sapphire
(6) Bolts	polyamide	PVDF
(7) Flange	PVC	PVC

Electrical Connection Diagram

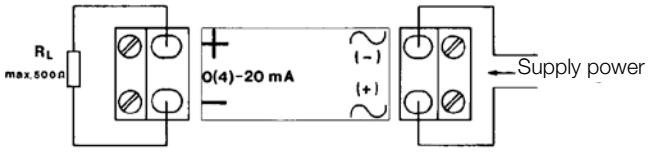
Connection diagram NPN TUR-1...N



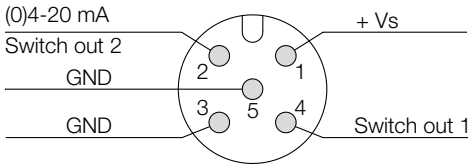
Connection diagram PNP TUR-1...P



Connection diagram transmitter TUR-2...M...



TUR-2...C...



Electronics

Frequency output

Power supply:	24 V_{DC} ±20%
Idle current:	typ. 15 mA
Pulse output:	PNP or NPN, max. 400 mA
Electrical connection:	2 m PVC cable

Transmittter

Power supply:	230 V_{AC}, 24 V_{AC}, 24 V_{DC}
Output:	0-20 mA, 4-20 mA or 0-10 V_{DC} 4-wire
Max. load:	500 Ω
Electrical connection:	adapter box with cable connection

Compact electronics

Display:	3-segment LED
Analogue output:	(0)4... 20 mA adjustable, max. 500 W
Switching outputs:	1 (2) semiconductor PNP or NPN factory set
Contact operation:	N/C / N/O contact programmable
Setting:	with 2 buttons
Power supply:	24 V_{DC} ±20%, 3-wire technology, approx. 100 mA
Electrical connection:	plug connector M12x1

ADI electronics

Display:	bar graph and 5-digit digital display
Analogue output:	(0)4...20 mA, 0-10 V_{DC}
2 switching outputs:	relay /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 connection:	pluggable terminal block via cable gland

For more technical details on ADI electronic indicator see data sheet ADI-1.

TUR-1...
with frequency output

TUR-2...
with integrated converter

Measuring sensor with frequency output – Order Details (example: **TUR-1025 N**)

Connection PVC flange Nominal dia.	Measuring range water [m³/h]	Frequency range [Hz[	Frequency [Pulses/Liter]	Model designation wetted parts		Pulse detector
				PVC	PVDF	
25	0.2 - 5.0	5.5 - 157	113	**TUR-1025...**	**TUR-1125...**	**..N** pulse detector NPN, 24 V_{DC}, 3-wire
50	1.2 - 20.0	4.8 - 79.4	14.30	**TUR-1050...**	**TUR-1150...**	
80	2.0 - 80.0	2.7 - 106.4	4.79	**TUR-1080...**	**TUR-1180...**	**..P** pulse detector PNP, 24 V_{DC}, 3-wire
100	2.5 - 100.0	2.1 - 82.2	2.96	**TUR-1010...**	**TUR-1110...**	

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Measuring sensor with ADI electronics – Order Details (example: **TUR-2025 M000**)

Connection PVC flange Nominal dia.	Measuring range water [m³/h]	Model designation wetted parts	
		PVC	PVDF
25	0.2 - 5.0	**TUR-2025...**	**TUR-2125...**
50	1.2 - 20.0	**TUR-2050...**	**TUR-2150...**
80	2.0 - 80.0	**TUR-2080...**	**TUR-2180...**
100	2.5 - 100.0	**TUR-2010...**	**TUR-2110...**

Evaluating electronics Transmitter

Supply	Output
..M0.. = 230 V_{AC} **..M2..** = 24 V_{AC} **..M3..** = 24 V_{DC}	**..40** = 4-20 mA **..00** = 0-20 mA **..10** = 0-10 V_{DC}

Compact electronics*

..C30R = LED display, 2x open collector, PNP, plug con. M12x1

..C30M = LED display, 2x open collector, NPN, plug con. M12x1

..C34P = LED display, 4-20 mA, 1x open collector, PNP, plug connector M12x1

..C34N = LED display, 4-20 mA, 1x open collector NPN, plug connector M12x1

Counter electronics

..E34R = 24 V_{DC}, 0(4)-20 mA

..E31R = 24 V_{DC}, 0-10 V

..E04R = 90-250 V_{AC}, 0(4)-20 mA

..E01R = 90-250 V_{AC}, 0-10 V

Dosing electronics

..G34R = 24 V_{DC}, 0(4)-20 mA

..G31R = 24 V_{DC}, 0-10 V

..G04R = 90-250 V_{AC}, 0(4)-20 mA

..G01R = 90-250 V_{AC}, 0-10 V

ADI electronics*

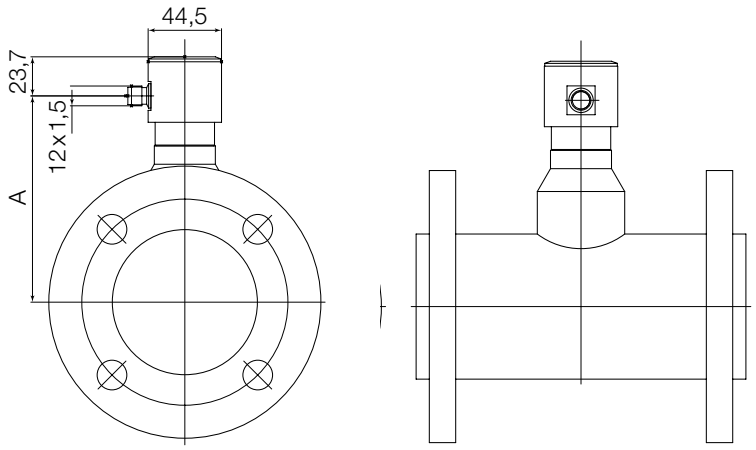
Display	Supply	Output	Contacts
..K.. = Bar graph/ Digital display	**0** = 100-240 $V_{AC/DC}$ **3** = 18-30 V_{AC}, 10-40 V_{DC}	**0** = without **4** = 0(4)-20 mA, 0-10 V	**2** = 2 change-over contacts

* Please specify flow direction in writing

Dimensions [mm]

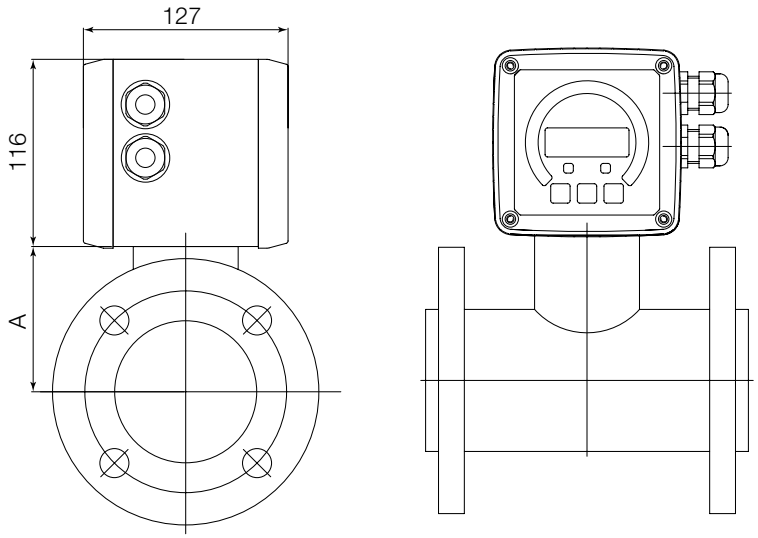
TUR with compact

Model	Dimension A
TUR-..25	112
TUR-..50	125
TUR-..80	140
TUR-..10	150



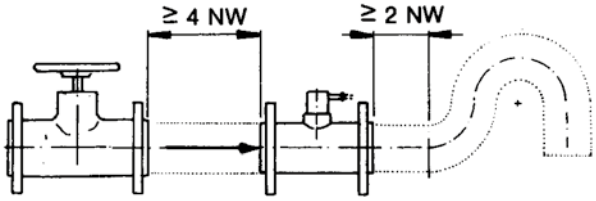
TUR with ADI-, Gxxx- and Exxx electronics

Model	Dimension A
TUR-..25	77
TUR-..50	90
TUR-..80	105
TUR-..10	115

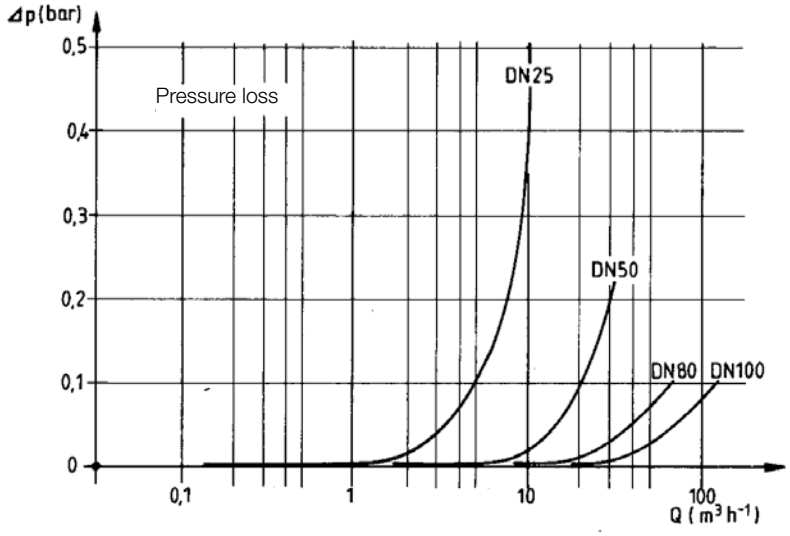


Installation Instructions

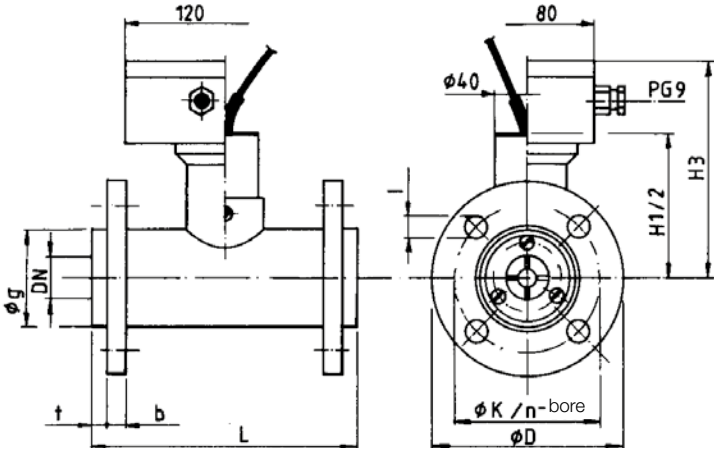
- Choice of installation position
- Flow rate in direction of arrow
- The unit must always be flooded with liquid (see Installation Example)
- The installation must be free of stress and with compressible seal
- Gaskets are not supplied



Pressure Loss Diagram



Dimensions [mm]



DN	b	D	g	H2*	H3	K	L	n	l	t
25	15	115	58	87	127	85	160	4x	14	9
50	20	165	88	100	140	125	200	4x	18	11
80	22	200	123	115	155	160	225	8x	18	11
100	22	220	145	125	165	180	250	8x	18	11

* with NPN- or PNP sensor