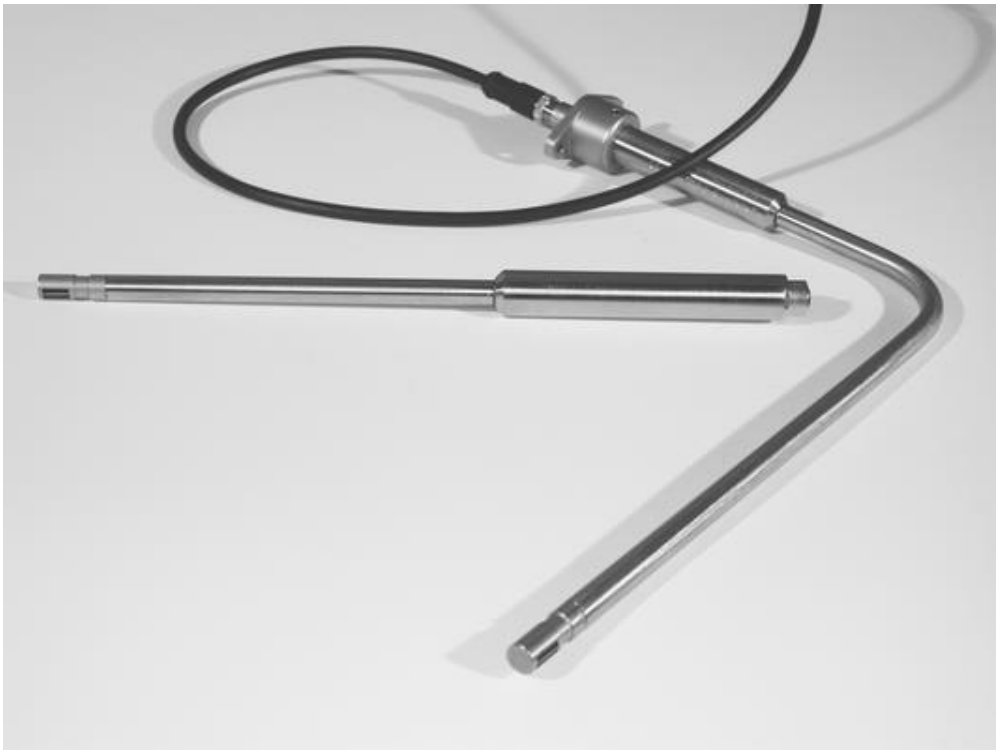
höntzsch
flow measuring technology

zertifiziert nach
ISO 9001
certified quality

Operating Instructions

Transducer UTA
integrated in
thermal flow sensor
TA10C



Contents

A1 Scope of Delivery

- transducer UTA integrated in the connection housing of the flow sensor TA10C
- data sheet Flow Sensor TA10C with integrated transducer UTA
- CD-ROM with PC configuration software UCOM (optional)
- adapter M12x8 / TTL-USB for PC with USB interface (optional)
- cable connector 2 m or 5 m (optional)
- probe attachment SH18 ZG1 for fixing the probe (optional)

Please check that everything listed in the Delivery Note / Technical Data Sheet is included in the delivery.

A1.1 Description, Type Plates

The following is engraved on the sensor:

TA10C Höntzsch GmbH 2012
ta 02 3557 E 80°C IP67 PS:16 bar
Tamb max: +50°C Tgas max: +80°C
Ex II 3 G Ex nA IIC T4 Gc X CE
Ex II 3 D Ex tc IIIC T135°C Dc X

TA10C	: sensor type
2012	: year of manufacture
IP67	: housing type of protection
PS	: max. permissible pressure (absolute)
ta 02 3557 E 80°C	: serial number with measuring range and max. medium temperature
T_{amb}	: ambient temperature range -20 ...+50 °C
T_{gas}	: medium temperature range -10 ...+80°C
Bottom lines	: marking for use in Ex-applications (see Instruction Manual Flow Sensors Category 3G and 3D, Document U384)

Pin assignment cable socket M12 x 8:

Power	1	white	: +24VDC	=	supply voltage +24 VDC
	2	brown	: 0VDC	=	supply voltage 0 VDC
Output	3	green	: ⎍⎍	=	digital output Open-Collector (with ref to GND)
	4	yellow	: 4...20 mA (0...10 V)	=	analog output +
	5	grey	: GND	=	reference potential (same as 2)
Serial TTL	6	pink	: (RxD)	=	(serial interface TTL level)
	7	blue	: (TxD)	=	(serial interface TTL level)
	8	red	: (+5Vout)	=	(+5V out)

A2 Technical Specifications

A2.1 Operating Conditions

Ambient temperature of the connection housing in service	: -20 ... +50 °C
Protection class	: IP67

A2.2 Housing and Connectors

Protection class	: housing IP67
Material	: stainless steel
Connection	: female socket M12 x 8 for cable connector 2 m or 5 m DIN IEC 61076-2-101

A2.3 Electrical Data

Supply voltage, mains supply	: 24 V DC (16 ... 27 V DC), power < 1.5 W, current < 50 mA at 24 VDC

The mains supply is not electrically isolated from the UTA outputs.

Analog output	: 4 ... 20 mA = 0 ... x m/s (or m³/h) terminal value x configurable / resistance max. 400 Ohm or 0 ... 10 V = 0 ... x m/s (or m³/h) terminal value x configurable / impedance 1 kOhm
Digital output	: (Open Collector Transistor), max. 20 mA / 27 V DC, configurable as limit value v or quantity pulse (see also A4 Functional Description)
Serial TTL interface	: for connection with PC programme UCOM (see also A4 Functional Description)

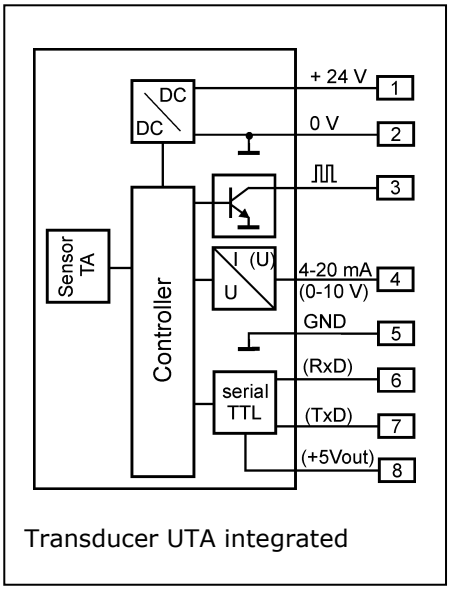
A2.4 Measurement uncertainty

Measurement uncertainty for flow velocity Nv : 2 % of measured value + 0.02 m/s

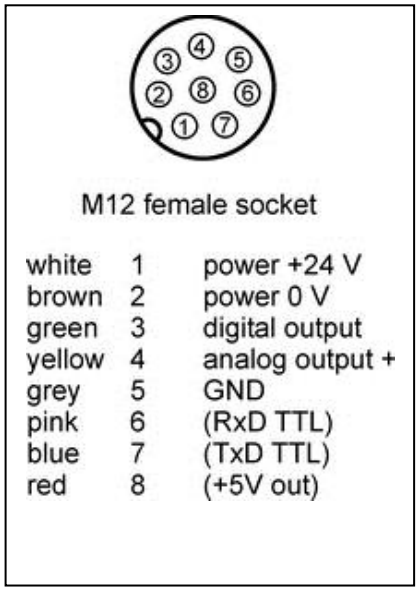
A3 Installation

Authoritative are the valid national regulations for installing electrical equipment, the general engineering regulations and these Operating Instructions.

A3.1 Block Diagram and Pin Assignment



Transducer UTA integrated



A3.2 Wiring Diagrams

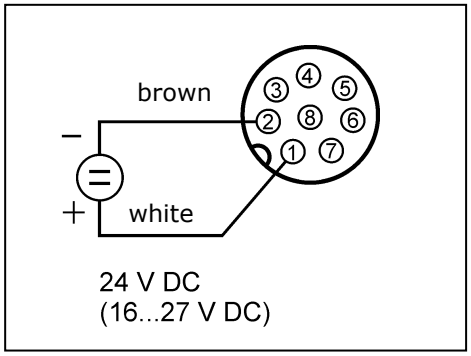
Electrical connection must be carried out according to the appropriate wiring diagram.
Faulty connection can cause damage to persons and destruction of the electronics.

Do not install or wire up the transducer under mains voltage. **Non-compliance can cause damage to persons and destruction of the electronics.**

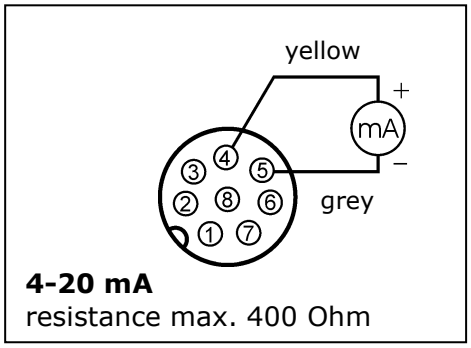
In this connection and depending on the configuration of the equipment, one of the following wiring diagrams must be followed.

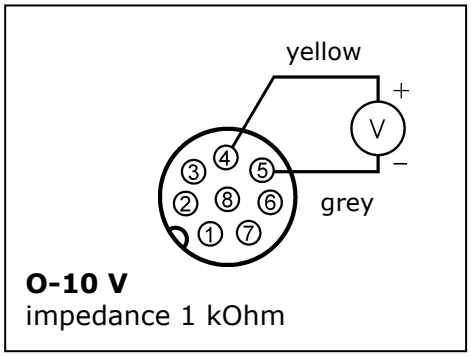
A3.2.1 Power supply

Before connecting please check that the power supply is within the specification.



A3.2.2 Analog output v



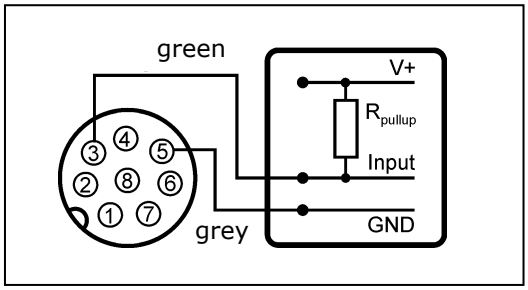


The terminal value of the analog output can be configured using the PC software UCOM via the serial TTL interface. The factory-set values can be found in the accompanying documents.

A3.2.3 Digital output (Open-Collector-Transistor)

The digital output is an Open Collector Transistor output with reference to GND.

The function of the digital output and the corresponding setting parameter is configurable via the serial TTL interface with PC software UCOM. The factory settings can be found in the parameter printout in the accompanying documents.



The reference potential terminal (5) of the UTA is connected to the GND terminal of the data logging. The open-collector transistor output (3) is connected to the input of the data logging, to which a pull-up resistor for internal supply voltage of the data logging must be connected (with 24 V as a rule 5...10 kOhm). The limit values for the digital output are: max. 20 mA / max. 27 VDC.

Note: The same power source as for the internal power supply for data logging can be used for power supply to the UTA, as the power supply and the outputs of the UTA transducer are on the same potential.

A3.2.4 Serial TTL interface

Abb. 1: Programming adapter M12 x 8 / TTL-USB for software UCOM, PC – USB connector, adapter plug 230 VAC/24VDC

To connect the serial TTL interface, plug the programming adapter into the UTA. The transducer is powered by the adapter.

PC connection is via a USB port.
(Driver installation necessary, driver on UCOM CD).

A4 Functional Description

The signals generated by the sensor are converted to a linear **analog output signal**. The analog terminal value is configurable.

4 ... 20 mA	=	0 ... x Nm/s (or Nm³/h)
0 ... 10 V	=	0 ... x Nm/s (or Nm³/h)

A **digital output** (Open Collector Transistor) can be configured for **1 of 2** different **functions**:

1. as **limit value** for the flow velocity or flow rate:
   flow velocity < or = limit value: Open Collector Transistor inactive
   flow velocity > limit value: Open Collector Transistor active

2. as **quantity pulse** for quantity measurement:
   max. pulse repetition frequency 1 Hz per unit of volume,
   configurable, e. g. 1 pulse per 1, 10 or 100 norm-m³ or norm-litre
   pulse duration 0.5 s

Self diagnosis according to NAMUR NE43 specifications:

no error	: analog output	= 4 mA	(flow velocity = 0)
or	analog output	> 4 mA	(flow velocity > 0)
error	: analog output	< 3.6 mA	

Monitoring of power supply, data logging, sensor interface and parameter settings (see under A10: Troubleshooting)

Serial TTL interface
for changing calibration data and setting parameters.

Connect programming adapter M12 x8 / TTL-USB (optional) to the TA10C sensor, then plug in the adapter. Connect USB cable to USB port on the PC.
(Driver installation necessary before first-time connection; drivers on UCOM CD)

Changes to the settings can now be made after starting the PC programme UCOM (optional) (see under A5: Settings).

A5 Settings

The setting parameters can be read using the UCOM software and are alterable.
The customer-specific settings of these parameters can be found in the shipping documents.

For operating instructions PC software UCOM see U385.

A6 Initial Operation

(Pay special attention to A3.2.1 Power supply and A3.2.2 Analog output)
On connecting the supply voltage:
No flow at sensor: the analog output sends a value of 4 mA.
Flow at sensor: the analog output sends an analog value deviating from the zero flow conditions (see above).

A7 Operation

(Pay special attention to A2.1 Operating Conditions and A2.3 Electrical Data)

A8 Shut-down, Dismantling

Before disconnecting the cable, please ensure that the supply voltage is switched off.

A9 Inspection

see under A4 Functional Description, Self diagnosis.

A10 Troubleshooting

Fault	Cause	Troubleshooting
Analog output = 0 mA	No power supply	Check cable, measure voltage at connecting terminals
	Faulty transducer electronics	Return to factory
Analog output = error (< 3.6 mA or < -0.2 V)	Parameter error	Check parameters using UCOM software, save new checksum (or return to factory)
	Faulty transducer electronics	Return to factory
	Sensor contaminated	Clean sensor according to instructions
Analog output = 4 mA, no value	Coefficient set at 0.000	Set coefficient to that pertaining to the nominal diameter and sensor type
Value too low	Sensor contaminated	Clean sensor according to instructions
	Coefficient setting too low	Set coefficient to that pertaining to the nominal diameter and sensor type
	Input/output section too short	Change sensor position; improve flow conditions with a flow rectifier
	Rotational flow	Reposition sensor in direction of flow; install flow rectifier
	Burden at current output greater than specified resulting in correct output values in the lower range and no longer increasing values at the top end of the meas-uring range	Reduce resistance
	Incorrect scaling of analog output	Check settings and amend if necessary
Value too high	Coefficient setting too high	Set coefficient to that pertaining to the nominal diameter and sensor type
	EMC problem	see reference to electromagnetic compatibility (EMC)

A11 Replacement Parts/Accessories

Integrated transducer UTA has no replacement parts.
An electronic self-restoring fuse is used.
Accessories (cable connector 2 m, 5 m for sensor connection, software UCOM for configuration using programming adapter M12x8 / TTL-USB see Data Sheet U391).