Temperature Transmitter
TF5A

Benefits

- Temperature measurement range -200… 600 °C
- Compatible with all PT100
- Freely programmable outputs and scaling via NFC-Interface & supports NFC Powerless

Applications

- Monitoring storage temperature of pharmaceutical drugs and vaccinations
- Pharmaceutical and industrial manufacturing
- Production, storage and drying processes

New housing
- Robust, PC-ABS industrial-quality hosuing (IP65)
- Wall mount version
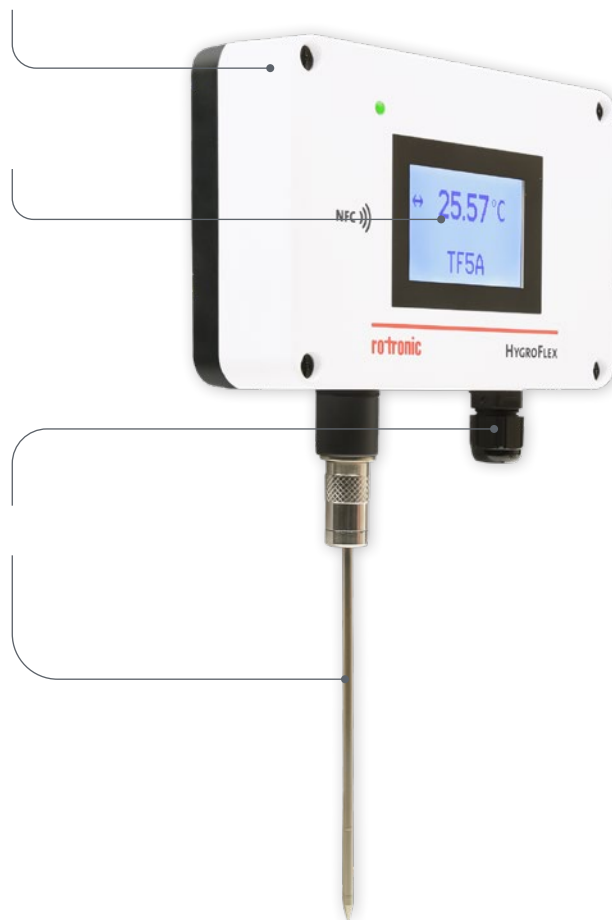- Display with trend indicator and backlighting[1]

Outputs
- The 2 analog outputs are freely selectable and scalable
- 2-wire (TF5A-2), 3/4- wire analog (TF5A-3) and 3/4- wire digital (TF5A-D) available
- RS485 signal on screw terminal for TF5A-D

Power supply
- 2-wire: 10…28VDC
- 3/4-wire: 18…36VDC
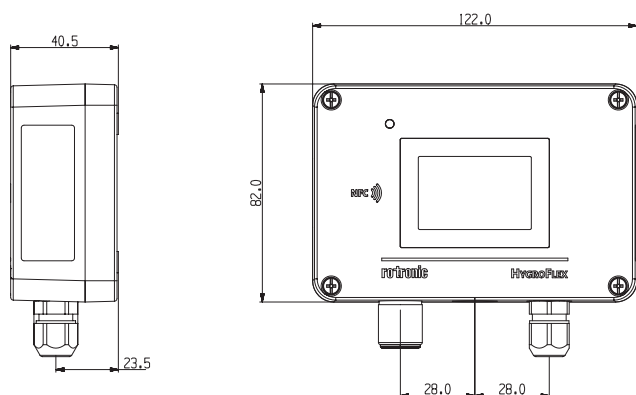
Flexible choice of probes
- Connection of a wide range of probes possible
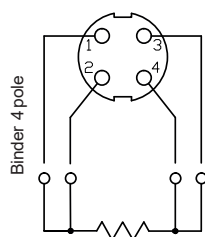- Compatible with all PT100 probes using a binder 4 pole connector.

[1] Backlighting is available only for the TF5A-3 or TF5A-D version.

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MEASUREMENT SOLUTIONS
A PST BRAND

TECHNICAL INFORMATION

TF5A-2, TF5A-3, TF5A-D
Wall version (W)

122.0

40,5

82,0

23,5

28,0   28,0

PT100 Connector pin-out

Binder 4 pole

	TF5A-2 2-wire	TF5A-3 / TF5A-D 3/4-wire
Temperature probe	PT100 Class A probes, various types	
Accuracy @ 23ºC	± 0.1ºC	
Initialization time	Typically, 5 sec.	
Measurement interval	1 sec.	
Measurement range	-200...600 ºC (probe dependent)	
Range of applications	-10...60 ºC with display -40...80 ºC without display	
Display	Resolution to 2 decimal places	
Output signals analog	4...20 mA	Freely scalable 0...1/5/10 V, 0...20, 4...20 mA
Resolution analog output	15 Bit	
Output signal digital	-	RS-485 signals on screw terminal
Cable connections	1 x M12, screw terminals	
Power supply	10...28 VDC	18...36 VDC
Circuit type	2-wire	3 /4 wire
Current consumption	2x23mA	max.80 mA (when both outputs are connected)
Load per analog output	Max. 500 Ω	
Interface	UART, NFC and USB	
Software	HygroSoft	
Housing material	PC-ABS	
Dimensions	122 x 82 x 40.5 mm	
Weight	204 g	
IP-Protection	IP65	
Soldering material	Lead free (RoHS-Directive 2011/65/ EU)	
Standards	CE Conformity 2014/30/EU	
Conformity	GAMP5 and FDA 21 CFR Part 11[1]	

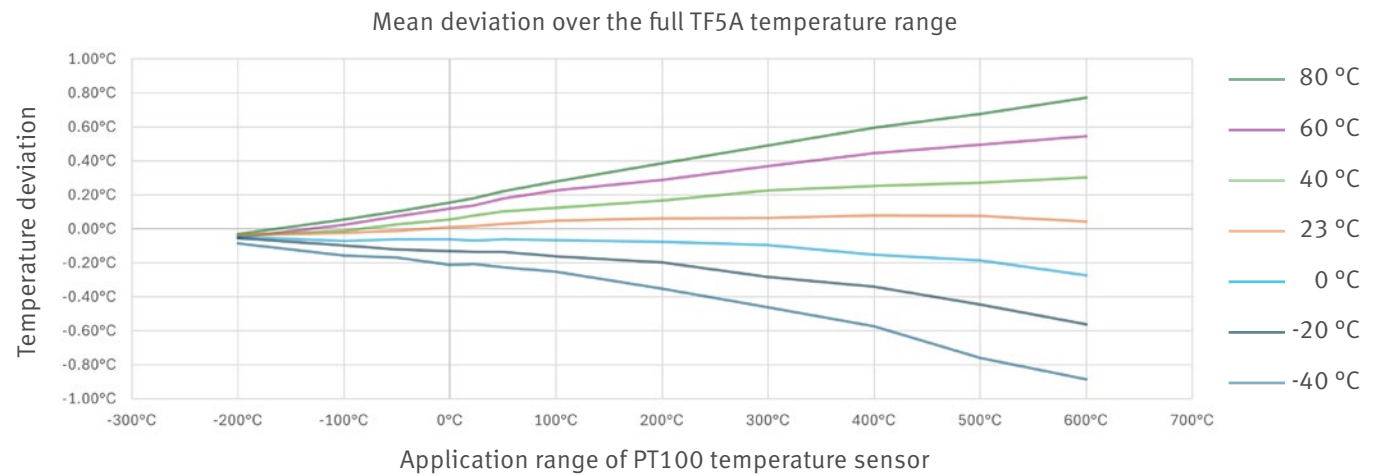*[1] FDA comformity is applicable only when the device is operated in combination with the HygroSoft software.*

PROBES FOR TEMPERATURE TRANSMITTERS

Order Code	Type	Accuracy @ 23ºC (Class A)	Application Range	Cable / Operating range at connector
AC1900	Fixed probe, 100 mm x 3 mm	± 0.20 ºC	-50...300 ºC	-40...105 ºC without cable
AC1903	Cable probe, 200 x 6 mm, not waterproof	± 0.20 ºC	-50...350 ºC	-40...105 ºC 2 m, thermoplastic cable
AC1904	Cable probe, 50 mm x 6 mm, waterproof	± 0.20 ºC	-50...105 ºC	-40...105 ºC 2 m, thermoplastic cable
AC1909	Fixed probe, 100 mm x 4.5mm, air measurement	± 0.20 ºC	-50...150 ºC	-40...105 ºC without cable
AC1913-A	Kapton foil probe, 20 x 15 x 2 mm	± 0.20 ºC	-50...200 ºC	-40...105 ºC 1 m, four PFA wires
AC1916-A-T	Cable probe, 60 mm x 6 mm, waterproof high temperature	± 0.20 ºC	-100...250 ºC	-40...85 ºC 2 m PTFE cable

Compatibility: TF5A all versions.

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PRECISION

Typical temperature dependence for the transmitter

Mean deviation over the full TF5A temperature range

Application range of PT100 temperature sensor

Legend:
- 80 °C
- 60 °C
- 40 °C
- 23 °C
- 0 °C
- -20 °C
- -40 °C

Accuracy of the measurement system

Transmitter: TF5A (PT100 @ 600°C)	
Electronic measurement accuracy @ -40°C	± 0.89 °C
Electronic measurement accuracy @ -20°C	± 0.56 °C
Electronic measurement accuracy @ 0°C	± 0.27 °C
Electronic measurement accuracy @ 23°C	± 0.1 °C
Electronic measurement accuracy @ 40°C	± 0.3 °C
Electronic measurement accuracy @ 60°C	± 0.5 °C
Electronic measurement accuracy @ 80°C	± 0.77 °C
Sensors: AC1900 / AC1903 / AC1904 / AC1909 / AC1913-A / AC1916-AT	
Accuracy at -100 °C	± 0.35 °C
Accuracy at 0 °C	± 0.15 °C
Accuracy at 23 °C	± 0.20 °C
Accuracy at 100 °C	± 0.35 °C
Accuracy at 200 °C	± 0.55 °C
Accuracy at 300 °C	± 0.75 °C

Example at different temperatures

Use of AC1900 @ 0 °C and TF5A @ 23 °C	
AC1900 accuracy @ 0 °C	± 0.15 °C
TF5A electronic measurement accuracy @ 23 °C	± 0.1 °C
Total accuracy @ 23 °C	± 0.25 °C[1]
Use of AC1900 @ 100 °C and TF5A @ 40°C	
AC1900 accuracy @ 100 °C	± 0.35 °C
TF5A electronic measurement accuracy @ 40 °C	± 0.12 °C
Total accuracy @ 40 °C	± 0.47 °C[1]
Use of AC1900 @ -50 °C and TF5A @ -20°C	
AC1900 accuracy @ -50 °C	± 0.25 °C
TF5A electronic measurement accuracy @ -20 °C	± 0.12 °C
Total accuracy @ -20 °C	± 0.37 °C[1]

[1] To calculate the overall accuracy of the transmitter, all variables must be added together.

Note: To improve the total measuerement accuracy of the transmitter and PT100 probes, it possible to carry out an customer adjustment.

ACCESSORY FOR TEMPERATURE TRANSMITTERS

Order Code		Accessories for Hygroflex Advanced Transmitters
NFC-USB-READER		The Temperature Transmitter TF5A devices are equipped with an NFC-interface[1] through which the device can be configured. The NFC-interface can be accessed by means of a mobile phone or a computer equipped with an NFC reader. The NFC-USB-READER has an USB plug to connect the Reader with a Computer and requires no further configuration. The transmitter is compatible with HygroSoft software only.

[1] Rotronic Switzerland AG only support the NFC-USB-READER, which can be purchased through Rotronic. Devices from third party suppliers cannot be considered.

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