TFP Ø 50 mm / 55 mm
Available until 31.03.2022

TFP Ø 18 mm
No longer available!

Successor: TSB
One sensor for all applications!

Successor: TSM
New, modular and better!

All advantages at **anderson-negele.com**

ANDERSON-NEGELE

**Product Information TFP-41, -44, -51, -54, -61, -161, -164, -181, -184** **FOOD**

# Temperature Sensor with G1/2" hygienic

CLEANadapt

## Application/Specified usage

- Temperature Measurement in vessels and pipes
- Front flush temperature measurement available

## Application examples

- Monitoring of CIP-/ SIP-process
- Measurement in vessels with agitators with front flush version
- Temperature monitoring in milk vessels

## Hygienic design/Process connection

- Flow optimized, hygienic and easy sterilizable installation by using Negele weld-in sleeve, e.g. EMZ-132 or build-in system, e.g. EHG-... / 1/2"
- Additional process connections: adapters for Tri-Clamp, dairy flange (DIN 11851), Varivent, DRD, APV et al
- Sealing system free of elastomers, the connection will be without gaps and crevices
- Product contacting materials compliant to FDA
- Sensor completely made of stainless steel resp. PEEK (front flush sensor)
- Conforming to 3-A Sanitary Standard 74-06 for front flush sensors

## Features/Advantages

- Front flush mounting possible
- Integrated transmitter optional
- Different electrical connections available

## Options/Accessories

- 2 x Pt100 (not retrofittable)
- 2 x Pt100 with two transmitters (not retrofittable)
- Programmable transmitters MPU-4 as well as MPU-M with output 4...20 mA, 2-wire
- Integrated transmitter for HART-protocol
- Programming adapter MPU-P 9701
- Integrated transmitter MPU-LCD with display in connecting head
- Pt100 chip with other classes of accuracy (1/3B, 1/10B)
- Fast response sensor tip 3 mm and 4 mm
- Spacer for high temperature up to 250 °C
  permanent temperature up to 450 °C (on request)
- Pre-assembled connecting cable for M12 plug
- Fixed cable in other lengths and other material available

**Temperature sensor TFP-164 / ... / MPU-M**

3-A 74-

**Temperature sensor TFP-41**

3-A 74-

## Accessories

**PVC-cable with M12-connection made of 1.4305, IP 69 K, unshielded**

| | |
|---|---|
| **M12-PVC / 4-5 m** | PVC-cable 4-pin, length 5 m |
| **M12-PVC / 4-10 m** | PVC-cable 4-pin, length 10 m |
| **M12-PVC / 4-25 m** | PVC-cable 4-pin, length 25 m |

**PVC-cable with M12-connection**

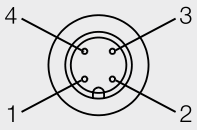
| Temperature sensor | | |
|---|---|---|
| **Process connection** | thread | G1/2" combined with Negele weld-in sleeves, build-in systems, adapter sleeves |
| **Tightening torque** | sensor sealing PEEK<br>sensor sealing stainless steel | 10 Nm<br>20 Nm |
| **Insertion length EL** | TFP-41, -51, -61, -161, -181<br>TFP-44, -54, -164, -184 | 20...500 mm<br>front flush |
| **Materials** | connecting head<br>thermowell<br>at TFP-44, -54, -164, -184 | stainless steel 1.4301 (AISI 304)<br>stainless steel 1.4404 (AISI 316L)<br>PEEK |
| **Operating pressure** | TFP-41, -51, -61, -161, -181<br>TFP-44, -54, -164, -184 | 50 bar maximum<br>10 bar maximum |
| **Temperature ranges** | ambient<br>sensor tip TFP-xx1<br>sensor tip TFP-xx4 | -50...+80 °C<br>-50...+250 °C<br>-50...+140 °C |
| **Sensing resistor** | acc. to DIN EN 60751 | Pt100 |
| **Electrical connection** | cable gland cable connection<br>fixed cable 2.5 m<br>fixed cable 2.5 m (≥ 90 °C) | M16 x 1,5<br>M12 plug 1.4301 (AISI 304), 4-pins<br>LIYY 4 x 0,25 mm²<br>PTFE 4 x 0,14 mm² |
| **Protection class** | | IP 69 K (with electrical connection M12 plug) |

| Transmitter MPU-4, MPU-H, MPU-M | | |
|---|---|---|
| **Temperature ranges** | ambient<br>storage | -40...+85 °C<br>-55...+90 °C |
| **Measuring ranges** | MPU-4, MPU-H, MPU-M | standard: -10...40 °C, 0...50 / 100 / 150 / 200 °C<br>special ranges free programable |
| **Accuracy** | input | < ±0.25 °C |
| **Temperature drift** | zero, span | < 0.01 % / K |
| **Supply** | MPU-4, MPU-H, MPU-M<br>accuracy | 8...35 V DC<br>0.01 % / V (reference: 12 V DC) |
| **Output** | signal<br>accuracy<br>burden | analog 4...20 mA<br>< ±0.1 % of measurement range<br>< 600 Ω (at $U_B$ = 24 V) |
| **Humidity** | without condensation | 0...98 % |

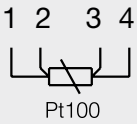
| Accuracy classes of temperature sensors \| Tolerances for Pt100 acc. to DIN EN 60751 | | | |
|---|---|---|---|
| **Pt100** | **A** | **1/3 B** | **1/10 B** |
| **0 °C / 100 Ω** | ±0,15 K / ±0,06 Ω | ±0,10 K / ±0,04 Ω | ±0,03 K / ±0,01 Ω |
| **100 °C / 138,5 Ω** | ±0,35 K / ±0,13 Ω | ±0,27 K / ±0,10 Ω | ±0,08 K / ±0,03 Ω |

## Electrical connection without transmitter

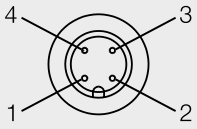
### With 1 x M12 plug



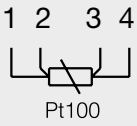

**Configuration 1st M12 plug**



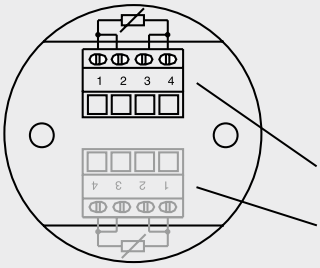

### With 2 x M12 plug



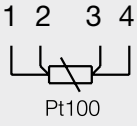

**Configuration 2nd M12 plug**




### With cable gland



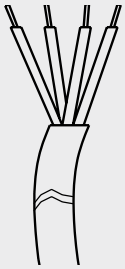

**Configuration strip terminal**




clamps for 1st Pt100

clamps for 2nd Pt100
(at version 2 x Pt100)

### With fixed cable

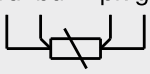


**Fixed cable connection with 1 x Pt100**

| | | |
|---|---|---|
| wh ye | bn gn | standard |
| rd rd | wh wh | PTFE |

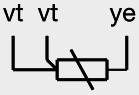

**Fixed cable connection with 2 x Pt100 (LIYY)**

| | | |
|---|---|---|
| wh ye | bn gn | 1st Pt100 |
| rd bu | pk gy | 2nd Pt100 |




**Fixed cable connection with 2 x Pt100 (PTFE)**

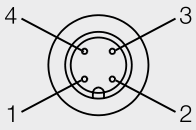
| | | |
|---|---|---|
| rd rd | wh | 1st Pt100 |
| vt vt | ye | 2nd Pt100 |




## Electrical connection with transmitter

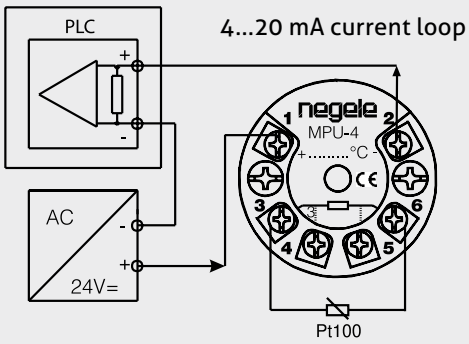
### With M12 plug

**Configuration M12 plug**




1: + supply
2: - supply 4...20 mA
3: not connected
4: not connected

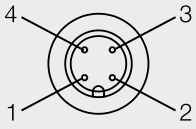
### With cable gland




## Electrical connection with two transmitter (TFP-61)

### With 1 x M12 plug (sensor 1 + sensor 2)

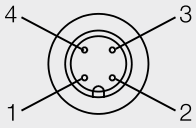
**Configuration M12 plug**




1: + supply (sensor 1)
2: - supply 4...20 mA (sensor 1)
3: - supply 4...20 mA (sensor 2)
4: + supply (sensor 2)

### With 2 x M12 plug (sensor 1)

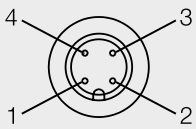
**Configuration M12 plug**




1: + supply (sensor 1)
2: - supply 4...20 mA (sensor 1)
3: not connected
4: not connected

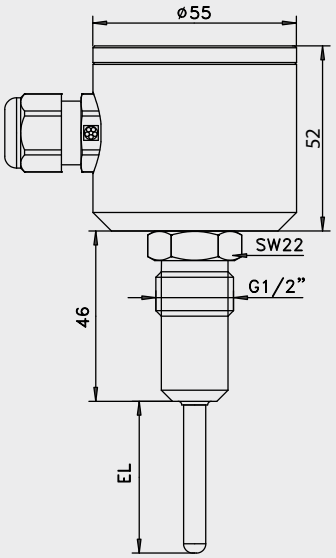
### With 2 x M12 plug (sensor 2)

**Configuration M12 plug**

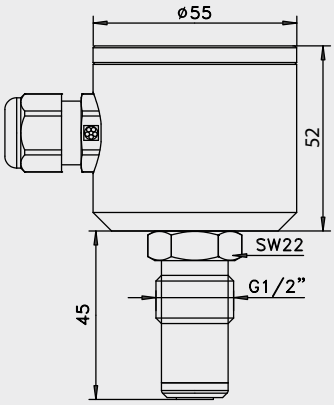



1: + supply (sensor 2)
2: - supply 4...20 mA (sensor 2)
3: not connected
4: not connected

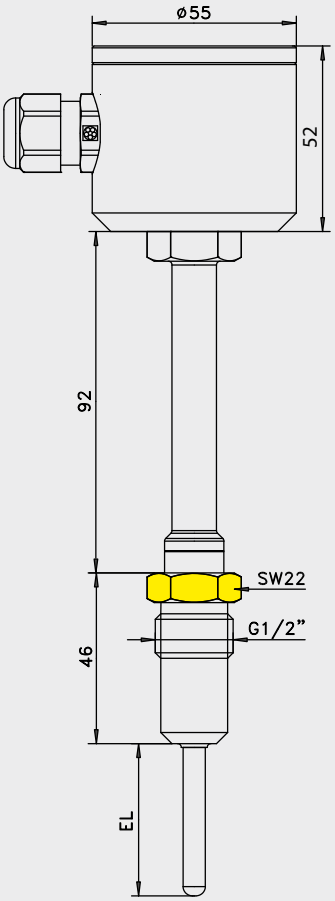
## TFP-41 | TFP-41.2




## TFP-44



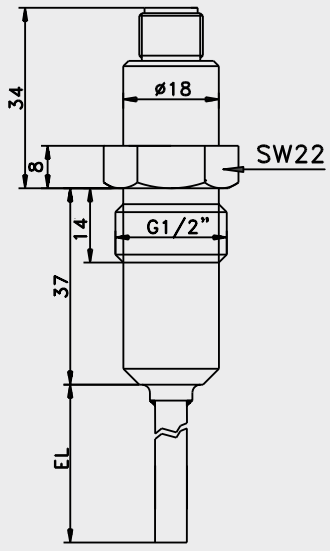

## TFP-51 | TFP-51.2



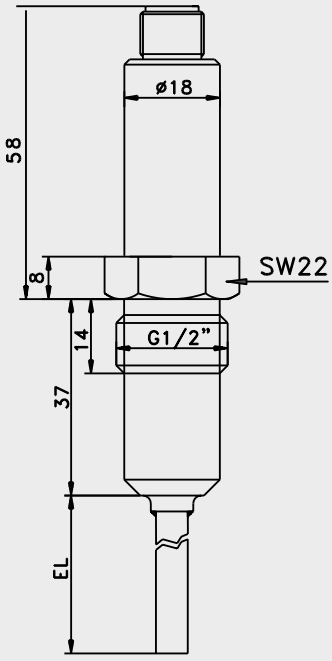

## Important advice for TFP-51, -51.2 and TFP-54

Tighten the sensor only at the lower, marked in yellow spanner flat (BE = 22 mm)!

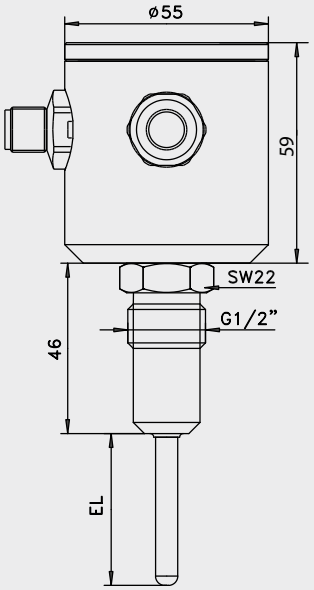
## TFP-161



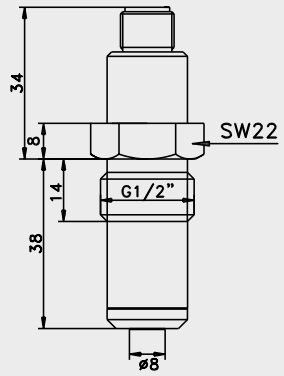

## TFP-161 / ... / MPU-M



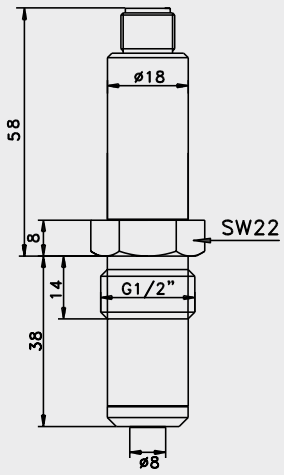

## TFP-61



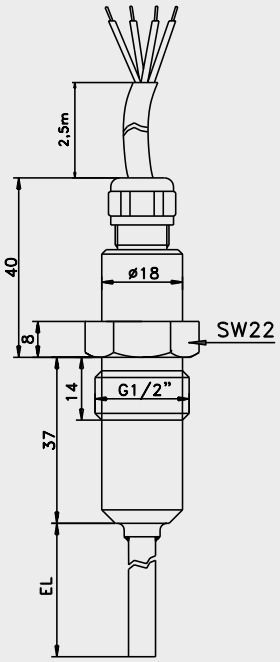
### TFP-164



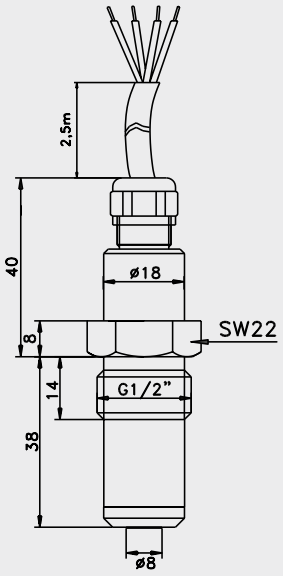

### TFP-164 / ... / MPU-M




### TFP-181 | 181.2




### TFP-184

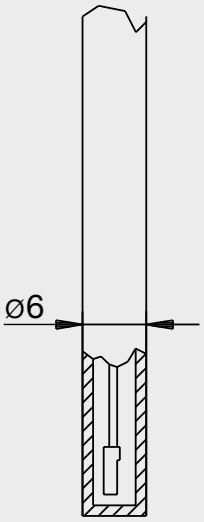



## Sensor tip diameter and response time

All temperature sensors are available with smaller sensor tips, to ensure a shorter response time. The below-mentioned times were measured by emersing a temperature sensor from room temperature into boiling water.

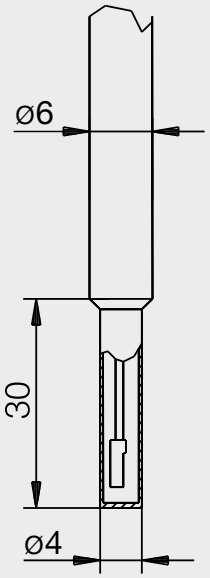
### Sensor tip Ø 6 mm

50 %-time: $t_{50} \leq 3.0$ s
90 %-time: $t_{90} \leq 8.0$ s



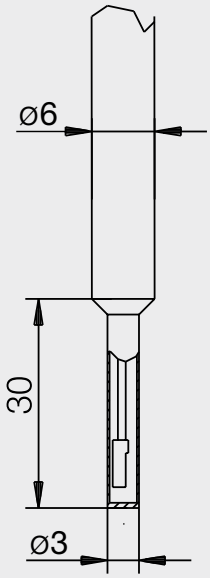

### Sensor tip Ø 4 mm

50 %-time: $t_{50} \leq 2.4$ s
90 %-time: $t_{90} \leq 6.5$ s



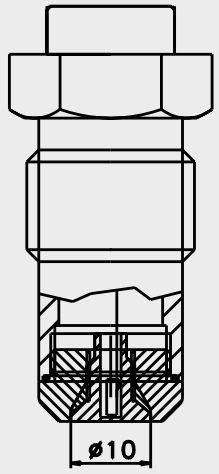

### Sensor tip Ø 3 mm

50 %-time: $t_{50} \leq 0.5$ s
90 %-time: $t_{90} \leq 1.5$ s




### Sensor front flush

50 %-time: $t_{50} \leq 5.7$ s
90 %-time: $t_{90} \leq 33.2$ s



## Conditions for a measuring point according to 3-A Sanitary Standard 74-06

- The sensors TFP-44, -54, -164, -184 conforming to the 3-A Sanitary Standard.
- The sensors are designed for CIP-/ SIP-cleaning. Maximum 140 °C / 120 minutes.
- Only with the build-in system CLEANadapt (EMZ, EMK, EHG with tube ≥ DN25, ISO 20 and G1", Adapter AMC and AMV) allowed.
- Using the weld in sleeve EMZ, EMK the weld must comply to the requirements of the current 3-A Sanitary Standard.
- Mounting position, self draining and the position of the leackage hole must be in accordance to current 3-A Sanitary Standard.

## Mechanical connection/Installation

- Use only Negele CLEANadapt system for safe operation of measuring point!

## Transport/Storage

- Do not store outside
- Store in an area that is dry and dust-free
- Do not expose to corrosive media
- Protect against solar radiation
- Avoid mechanical shock and vibration
- Storage temperature -55...+90 °C
- Relative humidity max. 98%

## Cleaning/Maintenance

- When using a pressure washer, do not point the nozzle directly at the electrical connections.

## Reshipment

- Sensors shall be clean and free of media or heat-conductive paste and must not be contaminated with dangerous media!
- Use suitable transport packaging only to avoid damage of the equipment!

## Note on 3-A Sanitary Standard 74-

Information on installation according to 3-A standard is available on our website:
www.anderson-negele.com/3A74.pdf

Click on the PDF icon to download the document.

PDF

*Click or Scan*

## Conventional usage

- Not suitable for applications in explosive areas.
- Not suitable for applications in safety-relevant system parts (SIL).

## Standards and guidelines

- Compliance with the applicable regulations and directives is mandatory.

## Note on CE

- Applicable directives:
  Electromagnetic Compatibility Directive 2014/30/EU
- Compliance with the applicable EU directives is identified by the CE label on the product.
- The operating company is responsible for complying with the guidelines applicable to the entire installation.

## Disposal

- Electrical devices should not be disposed of with household trash. They must be recycled in accordance with national laws and regulations.
- Take the device directly to a specialized recycling company and do not use municipal collection points.

## Order code for version with 1 x Pt100

**TFP-41** (connecting head Ø 55 mm)
**TFP-44** (connecting head Ø 55 mm, front flush) Ⓐ
**TFP-51** (connecting head Ø 55 mm, with spacer)
**TFP-54** (connecting head Ø 55 mm, with spacer, front flush) Ⓐ
**TFP-161** (connecting head Ø 18 mm, electrical connection M12 plug)
**TFP-164** (connecting head Ø 18 mm, electrical connection M12 plug, front flush) Ⓐ
**TFP-181** (connecting head Ø 18 mm, electrical connection 2.5 m PTFE-cable, other lengths: see accessories, no transmitter possible!)
**TFP-184** (connecting head Ø 18 mm, electrical connection 2.5 m PTFE-cable, other lengths: see accessories, front flush, no transmitter possible!) Ⓐ

**Sensor length in mm**
**020...500** (in steps of 5 mm)
**xxx** (special length on request)

**Diameter thermowell in mm (not selectable for TFP-44, -54, -164, -184)**
**6**
**8**
**10**
**12**

**Diameter sensor tip in mm (not selectable for TFP-44, -54, -164, -184)**
**X** (no reduction)
**3** (only for thermowell 6 mm)
**4** (only for thermowell 6 mm and 8 mm)
**6** (only for thermowell 8 mm and 10 mm)
**8** (only for thermowell 12 mm)

**Accuracy class Pt100**
**A**
**1/3B**
**1/10B**

**Electrical connection**
**(not selectable for TFP-161, -164, -181, -184)**
**PG** (cable gland M16x1.5)
**M12** (M12 plug, standard with MPU-LCD)

**Transmitter**

**X** (without)

**only for TFP-41, -44, -51 and -54**
**MPU-4** (programmable)
**MPU-H** (HART-protocol)
**MPU-LCD** (with display)

**only for TFP-161 and -164**

**MPU-M** (programmable)

**Measuring range MPU**
**(only for types with transmitter; not at MPU-LCD)**
**-10...40** (range -10...40 °C)
**0...50** (range 0...+50 °C)
**0...100** (range 0...+100 °C)
**0...150** (range 0...+150 °C)
**0...200** (range 0...+200 °C)
**xx...yy** (special range)

**TFP-41 / 100 / 6 / X / A / PG / MPU-4 / 0...100**

**TFP Ø 50 mm / 55 mm**
Available until 31.03.2022

**TFP Ø 18 mm**
No longer available!

**Successor: TSB**
One sensor for all applications!

**Successor: TSM**
New, modular and better!

All advantages at **anderson-negele.com**

## Order code for version with 2 x Pt100

**TFP-41.2** (connecting head Ø 55 mm, 2 x Pt100, no transmitter possible!)
**TFP-51.2** (connecting head Ø 55 mm, 2 x Pt100, with spacer, no transmitter possible!)
**TFP-61** (higher connecting head Ø 55 mm, 2 x Pt100, prepared for 2 x transmitter)
**TFP-61-H** (like TFP-61, but with spacer)
**TFP-181.2** (connecting head Ø 18 mm, electrical connection 2.5 m PTFE-cable; other lengths: see at accessories)

**Sensor Length in mm**
**020...500** (in steps of 5 mm)
**xxx** (special length)

**Diameter thermowell in mm**
**6**
**8**
**10**
**12**

**Diameter sensor tip in mm**
**X** (no reduction)
**3** (only with thermowell 6 mm)
**4** (only with thermowell 6 mm and 8 mm)
**6** (only with thermowell 8 mm and 10 mm)
**8** (only with thermowell 12 mm)

**Accuracy class Pt100**
**A**
**1/3B**
**1/10B**

**Electrical connection (only for TFP-41.2 and TFP-51.2)**
**PG** (cable gland M16x1.5)
**2PG** (2 x cable gland M16x1.5)
**2M12** (2 x M12 plug)

**Electrical connection (only for TFP-61 and TFP-61-H)**
**M12** (M12 plug)
**2M12** (2 x M12 plug)

**Continue if TFP-61 oder TFP-61-H is selected!**
**No further options for TFP-41.2, -51.2, -181.2!**

**1. Transmitter**
**MPU-4** (programmable)

**Measuring range 1. MPU**
**-10...40** (measuring range -10...40 °C)
**0...50** (measuring range 0...+50 °C)
**0...100** (measuring range 0...+100 °C)
**0...150** (measuring range 0...+150 °C)
**0...200** (measuring range 0...+200 °C)
**xx...yy** (special range)

**2. Transmitter**
**MPU-4** (programmable)

**Measuring range 2. MPU**
**-10...40** (-10...40 °C)
**0...50** (0...+50 °C)
**0...100** (0...+100 °C)
**0...150** (0...+150 °C)
**0...200** (0...+200 °C)
**xx...yy** (special)

**TFP-61 / 100 / 6 / X / A / M12 / MPU-4 / 0...50 / MPU-4 / 0...50**

**TFP Ø 50 mm / 55 mm**
Available until 31.03.2022

**TFP Ø 18 mm**
No longer available!

**Successor: TSB**
One sensor for all applications!

**Successor: TSM**
New, modular and better!

All advantages at **anderson-negele.com**

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