



# Temperature measurement



**Example of connections of particular elements**

**Temperature display units**

**BGK85**



Option →



Computer, control, itp.

**Temperature measurement**

**TFC**



**TFL**



**Temperature regulator**

**BGK81  
BGK84**



**J, K, L, PT 100**



## Melt temperature measurement and control

BAGSIK Sp. z o.o. Temperature sensors from our offer are designed to measure temperature of melt plastics including rubber, paste and liquids up to 400°C.

The measurement may be carried out through different type configurations:

Only PT100 sensor can be connected with a copper cable. Other J, K, L types should be linked with the same type cables.

The sensor structure does not influence the flow itself and it does not degrade plastics which must be homogenised.

It is recommended to use sensors with a cone to measure the temperature inside the canal, not next to the flange wall. The length of metering tip must be adjusted to the melt canal diameter. All other ways of use are unacceptable and resulted damages are not covered by guarantee.

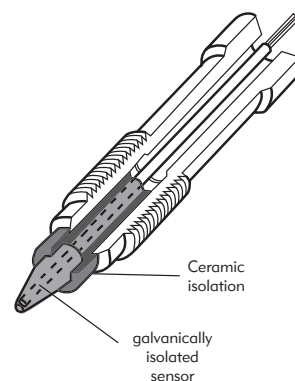
If we have only one hole available, the pressure transducer can be used with the temperature transducer. The transducer membrane must touch material, for this reason the melt temperature measurement is calculated next to the flange wall. Metal temperature caused by barrel or heater flange will have impact on this measurement.

### Temperature sensor and cable connections

Transducer with a thermally insulated tip allows an accurate and honest measurement of molten material temperature. Thanks to the ceramic insulation, temperature does not affect the measurement.

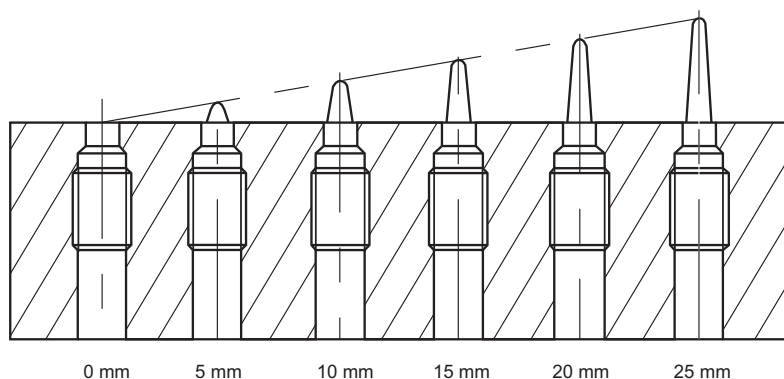
### Temperature sensor design with ceramic insulation

All temperature sensors are equipped with coned measurement tip permitting a correct and simple covering. These cable connections are also equipped with stable end with rotate-and-lock coupling. The length of metering tip may be selected within 0-25 mm. The standard version may be used to 400°C. For high temperatures we offer special sensors for up to 500°C.



### Length of metering tip

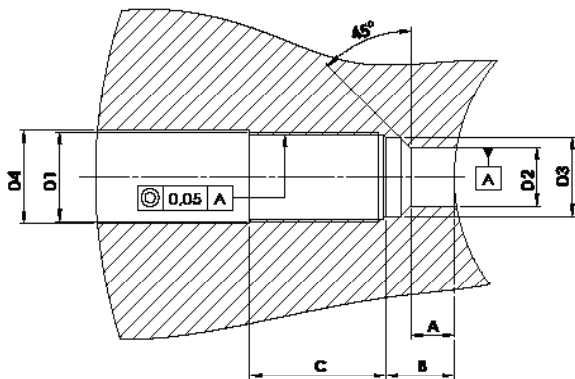
Selection of metering tip length depends on the canal diameter and material viscosity. The length may vary between 0 and 25 mm in 5 mm long intervals. Ends are equipped with thermocouples Fe-CuNi of J, NiCr-Ni of K type or thermometric Pt100 resistors.



**For standard sensors, like for screens, we assure delivery of the ordered goods within 24 h from the moment of order placement.**

## Temperature sensor installation

To make a hole to install the sensor, special tools and high skills are required. High tolerance and surface quality maintenance is difficult. For this reason, we suggest using reducer bushes.



Dimensions	Thread	
	M18 x 1.5 mm	1/2 - 20UNF-2A
D1	M18 x 1.5 mm	1/2 - 20UNF-2A
D2	$\text{Ø } 10.1 + 0.1$	$\text{Ø } 7.9 + 0.1$
D3	$\text{Ø } 16.1 + 0.2$	$\text{Ø } 13 + 0.2$
D4	$\text{Ø } 20 + 0.2$	$\text{Ø } 13 + 0.2$
a	6.1 - 0.1	5.7 - 0.1
b	10 - 0.3	8.9 - 0.3
c	25	19

## Warning !

Before the transducer installation, the dimensions of the mounting thread should be controlled in regard to correct dimension maintenance and tolerance. Additionally, the hole should not contain any contamination or material remnants. We recommend using the plug before screwing in the sensor in order to check the thread and copper paste for easier sensor unscrewing during the disassembly. The transducer should be screwed in sealing surface (cone) without using a spanner.

The moment of transducer installation for 1/2"-20UNF thread is 5 Nm, for M18x1,5 thread – 10Nm.

## Temperature sensor disassembly

Sensor disassembly should be carried out in a heated state ( in the temperature of material melting).

# Temperature sensors without an insulated metering tip

## series TFC / TFL

### TFC



TFC line is intended for measuring temperature of all kind of molten polymer. These sensors are characterized by an exceptionally attractive price, reliability, versatility, compatibility and maximum quality. Cables and plugs located on the sensor head ensure a good connection quality. TFC sensors may be delivered with thermocouple Fe-CuNi of J, L types and NiCr-Ni of K type, as well as Pt 100 - 2, 3 and 4-wired. The installation is the same as for other sensors measuring liquid temperature.



#### Technical data for TFC and TFL

Sensor	Thermocouple or resistance sensor
Output signal (integrated with the amplifier)	0-10 VDC 4-20 mA (linear temp.)
Transfer of heat value	1.4305: 15W/m x k
Insulating sleeve	2.5 W/m x k
Material contacting the medium	1.4305 2.4610 (optional)
Isolation of the resistance in temperature sensors	at 20°C, about 200 MOhm at 100 V, at 400°C, about 2040 MOhm at 100 V
Max pressure of the molten medium	2000 bar

#### Special features of temperature sensor:

- High quality and durability
- Golden plug connection
- High durability
- Attractive price
- Versatility, compatibility
- Suitable for temperature of up to 400°C

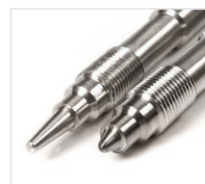
### TFL



TFL temperature sensor is a universal and at the same time practical sensor for temperature measurement thanks to the use of resistant thermocouple. It is a durable and resistant sensor for measuring temperature using a resistant thermocouple. It is a solid and resistant device, the figure of which is based on a one-piece shaft. The cable length between the sensor and the plug may vary according to customer's needs. The sensor may be equipped with a thermocouple Fe-CuNi of J, L types and NiCr-Ni of K type. The thermocouple Pt 100 - 2, 3 or 4-wired is also possible. Dimensions and threads are identical as in other types of liquid temperature transducers.

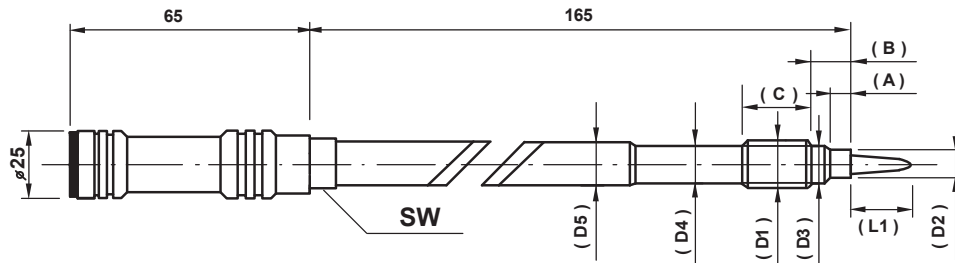
#### Special features of temperature sensor:

- High durability
- Universal compatible connection socket
- High quality and durability
- Suitable for temperature of up to 400°C
- Different lengths of metering tips
- Perfect quality for the offered price



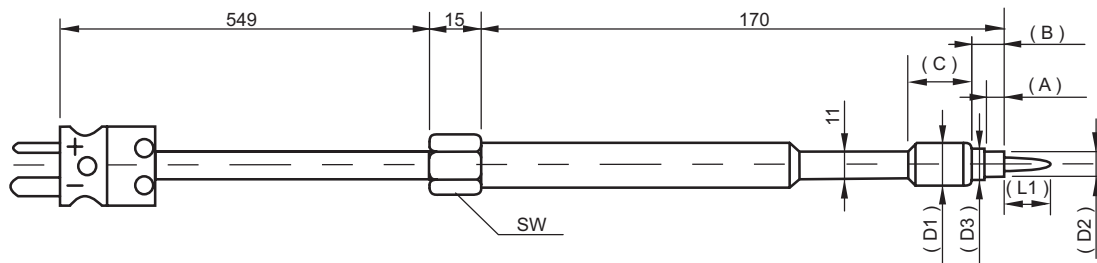
# Temperature sensors without an insulated metering tip

## series TFC / TFL



TFC

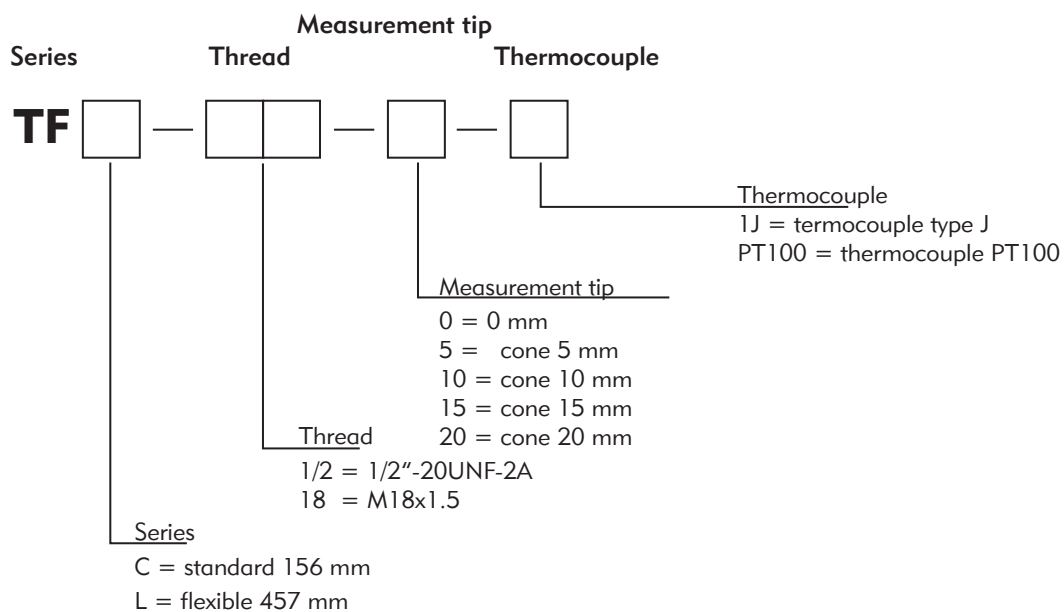
D1	D2	D3	D4	D5	A	B	C	SW
M18 x 1.5	10	16	16	16	6	14	20	22/19
1/2-20UNF-2A	7.8	10.5	10.5	12.5	5.6	10.8	17	17



TFL

D1	D2	D3	D4	D5	A	B	C	SW
M18 x 1.5	10	16	16	16	6	14	20	22/19
1/2-20UNF-2A	7.8	10.5	10.5	12.5	5.6	10.8	17	17

### How to order



Example: TFC-1/2-5-1J  
Melt temperature sensor, standard 156 mm, thread 1/2"-20UNF, cone tip 5 mm, integrated thermocouple type J.

Example: TFL-1/2-10-1J  
Melt temperature sensor, flexible 457 mm, thread 1/2"-20UNF, cone tip 10 mm, integrated thermocouple type J.

Fe-CuNi, NiCr-Ni / Pt 100, Pt 500, Pt 1000

# Thermocouple



Thermocouple, known also as thermo-element or thermo-cell, is one of the automation elements to measure temperature. It is characterized by high reliability, fineness and elasticity of structure which allows to apply it in different conditions. Available with 1 or 2 thermo-cells. Thanks to its springs, the depth of thermocouple immersion can be steplessly regulated by the rotation of the bayonet cap.

Technical data	
Number of thermocouples	1, 2
Diameter	Ø 4 Ø 6 Ø 8
Type of tip	flat 120° angle
Type of thermocouple	Fe-CuNi type J Fe-CuNi type L NiCr-Ni type K Pt 100/500/1000
Internal diameter of fastener, dipstick cap	250 mm
Bushing thread	Ø 12,2 Ø 14,5
SW1, length of 30mm	M10 x 1 M12 x 1 M14 x 1.5 G 1/4 G 3/8 M12 x 1.75 G 1/2

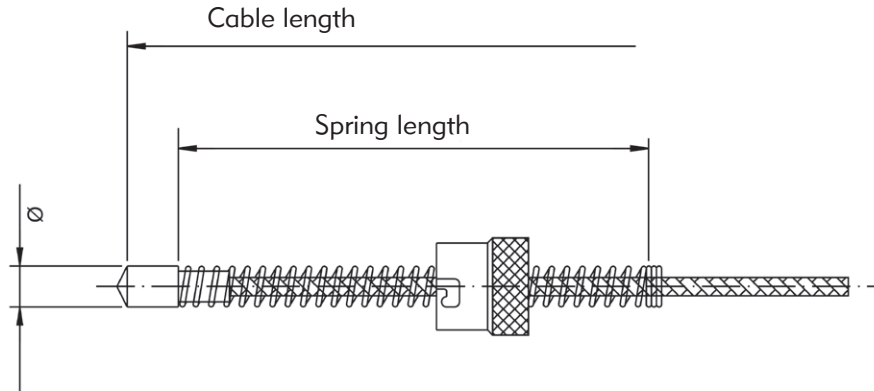
## Special features of thermocouples:

- No external power supply required
- Small dimensions
- Low thermal volume
- Low inertia time
- Wide range of measurements with good linearity
- Simple structure
- high reliability



Fe-CuNi, NiCr-Ni / Pt 100, Pt 500, Pt 1000

# Thermocouple



Thermocouple		T	U	J	L	E	K	N	R, S	B
Material	+	Cu	Cu	Fe	Fe	NiCr	NiCr	NiCrSi	Pt10Rh	Pt30Rh
	-	CuNi	CuNi	CuNi	CuNi	CuNi	Ni	NiSi	Pt	Pt6Rh
Color										

**Warning**

To connect and extend cables, the cable of the same type as the one of transducer is needed (except for Pt100 – regular copper Cu cable)!!!

## How to order

**Thermocouple**

Series	Type	Tip	Thread	Cable	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
					Cable length
					3 = 3 meter
					5 = 5 meter
					10 = 10 meter
					Bayonet thread
					10 = M10x1
					12 = M12
					14 = M14x1.5
					Diameter of tip
					4 = $\varnothing$ 4
					6 = $\varnothing$ 6
					8 = $\varnothing$ 8
					Thermocouple type
					J = thermocouple type J - 400°C
					L = thermocouple type L - 410°C
					PT100-3 = Thermocouple type PT100 - 3 wire
					PT100-4 = Thermocouple type PT100 - 4 wire

Example: Thermocouple J-6-14-5  
Thermocouple, type J, diameter of tip  $\varnothing$ 6, bayonet thread M14x1.5, cable length 5 meter.



# Accessories

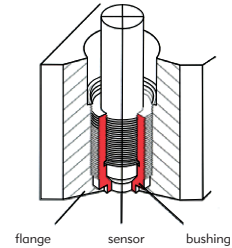
## Reducer bushing

Reducer Bushing make it easy to make a hole for mounting the temperature and pressure sensors. The bushing is made of hardened and nitrided steel. To mount reducing bushing it is enough to use a regular M16, M18 or M24 tap metric.



Reducer bushing types:

- M16 – 1/2" - 20 UNF - 2A
- M18x1,5 – 1/2" - 20 UNF - 2A
- M24 – M18x1,5



## Screwdrivers for reducer bushings

Special screwdriver was designed to screw in and unscrew reducer bushings. It is required to avoid damaging the reducer bushing during tightening it with maximum torque.



## Reduction bushing socket cleaning tool

Any contamination of sensor mounting thread can cause its destruction. To avoid this the socket and reduction bushing mounting thread should be cleaned before every sensor replacement. This will extend the life of the sensor and reduction bushing.



## Plug tools

All unused holes for pressure and temperature sensors should be closed with special closing plugs with suitable thread, assuring 100% hole tightness.

Dimensions:

- 1/2" - 20 UNF - 2A
- M18 x 1,5 mm
- M24



# Accessories



## Interconnect cables

Standard cables have one plug at one end to connect with transducer. All standard interconnect cables are 3, 5, 7.5 and 10 m long. Special sets of measuring cables may be delivered on special request (e.g. resistant to high temperature).



## Plugs

Converters and temperature and pressure transducers are connected with high quality resistant and reliable plugs. All plugs have golden pins and they are compatible with EMC and assure the security in compliance with technological standards.



## SSR-Solid State Relay

SSR type:

- 10 A / 25 A / 40 A / 60 A / 75 A



## Bayonet

Threaded sleeve with a thermocouple holder, available in the following dimensions:

- M10x1
- M12x1
- M14x1.5



## Bag Fast Clean

High quality paste for cleaning metal elements from plastics and contamination.

How to use: with our paste, metal elements may be cleaned from stuck or burnt plastics in two ways:

**Hot** - put the paste on a preheated element (steel), place it equally on the whole surface and then using a brass brush located e.g. in the drill clean the given element

**Cold** - the surface intended to be clean spray with oil and then using a brass brush scrape filings off the paste onto the element that is being cleaned. Using a brass brush located e.g. in the drill clean well the given element.





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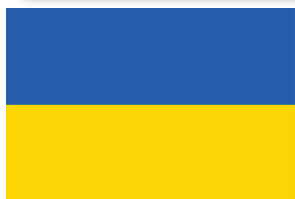
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