

Resistance thermometer

For sanitary applications, flush, NEUMO BioControl®

Model TR20

WIKA data sheet TE 60.20



for further approvals
see page 7

Applications

- Food industry
- Sanitary applications
- Bio and pharmaceutical industries
- Mounting in vessels with wipers
- Vessels for stirring and mixing

Special features

- Dead space free
- Hygienic design
- Materials and surface finish qualities in accordance with standards of hygienic design
- Material and surface finish qualities in accordance with pharmaceutical industry directives and standards
- Flush measurement, no invasive elements



Resistance thermometer model TR20
Options: Sealing combination at neck tube, cable gland in hygienic design

Description

The model TR20 resistance thermometer is used for temperature measurement in sanitary applications.

It features a flush NEUMO BioControl® connection and is therefore particularly suited to applications where a thermowell which extends into the process medium is either not possible or not desired. For increased hygiene requirements for those elements in contact with the surrounding environment, a stainless steel head is available in an optimised hygienic design.

The TR20 in combination with the block flange (low-profile design) is especially suitable for temperature measurement in mixing and agitating vessels with a wiper. The result is a flush-mounted instrumentation at the vessel wall. Thus an easy removal of the process medium from the inner wall is enabled by means of a rotating wiper. This results in a good homogenous mixture of the components and, at the same time, accurate temperature measurement in a mixing vessel.

BioControl® is a registered trademark of the company NEUMO.

Sensor

Versions with 1 x Pt100 in 2-, 3- or 4-wire connection.

Tolerance value/Application range of the measuring element per EN 60751 ¹⁾

- Class A (not with 2-wire connection) -30 ... +250 °C
- Class B -50 ... +250 °C

The combination of a 2-wire connection with class A is not permissible, since the lead resistance overrides the higher sensor accuracy.

The sensor is connected permanently with the connection flange and thus not exchangeable. For calibration, the complete measuring instrument must be removed from the BioControl® case. Then, the TR20 can be calibrated in a calibration bath.

For detailed specifications for Pt100 sensors, see Technical information IN 00.17 at www.wika.com.

1) Specification is only valid for the measuring element. Depending on the process connection, the deviation can be greater.

Documentation and correction of measuring deviations

With these electrical thermometers, the measuring deviation can be determined under realistic mounting conditions and confirmed with a test certificate. The standard test temperature is 70 °C; others available on request.

If a digital transmitter is mounted within the thermometer, any measuring deviation determined can be corrected using the transmitter's adaption feature.

Neck tube

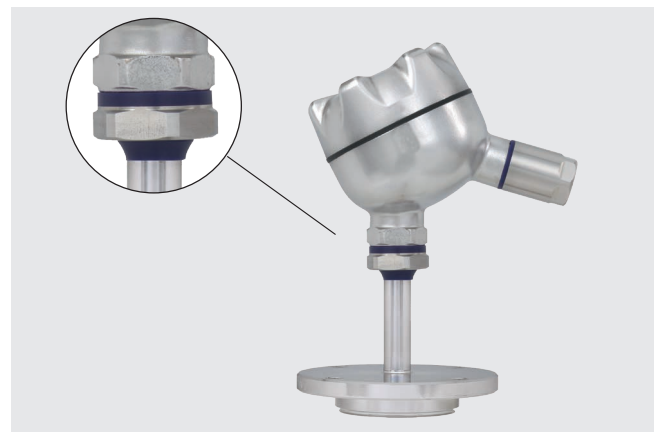
- Material: Stainless steel
- Diameter: 12 mm
- Neck length: 70 mm (standard)
50 mm

others on request

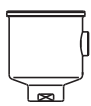
Options

The transition from the connection head to the thermowell is effected via an optional sealing combination (polyurethane) of flat gasket and wiper. This combination permanently prevents the penetration and depositing of humidity and impurities in this area (IP68). Additionally, the sealing combination simplifies the cleaning process significantly.

In combination with the patented BVS head and the cable gland in hygienic design, it delivers an easy-to-clean and hygienic measuring point, even in those areas not in contact with the product.



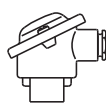
Connection head



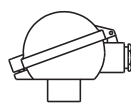
BVC



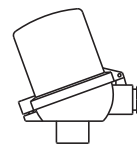
BVS



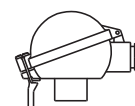
BS



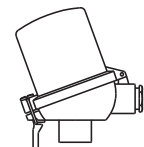
BSZ



BSZ-H



BSS



BSS-H

| Model | Material | Cable outlet | Ingress protection | Cap | Surface |
|-------|--------------------------|-------------------------|--------------------|---------------------------------------|---------------------------------|
| BVC | Stainless steel (1.4571) | M16 x 1.5 ¹⁾ | IP68 | Flat screw-on lid | Natural finish |
| BVS | Stainless steel (1.4308) | M20 x 1.5 ¹⁾ | IP65 | Screw-on lid, hygienic design | Precision-cast, electropolished |
| BS | Aluminium | M20 x 1.5 ¹⁾ | IP65 (IP68) | Cap with 2 screws | Blue, lacquered ²⁾ |
| BSZ | Aluminium | M20 x 1.5 ¹⁾ | IP65 (IP68) | Hinged cover with cylinder head screw | Blue, lacquered ²⁾ |
| BSZ-H | Aluminium | M20 x 1.5 ¹⁾ | IP65 (IP68) | Hinged cover with cylinder head screw | Blue, lacquered ²⁾ |
| BSS | Aluminium | M20 x 1.5 ¹⁾ | IP65 | Hinged cover with clamping lever | Blue, lacquered ²⁾ |
| BSS-H | Aluminium | M20 x 1.5 ¹⁾ | IP65 | Hinged cover with clamping lever | Blue, lacquered ²⁾ |

1) Standard
2) RAL 5022

Cable outlet with M12 x 1 coupler connector / 4-pin (option)

Instead of a standard cable gland, the cable outlet of a connection head can optionally be designed with an M12 x 1 (4-pin) coupler connector. The resulting maximum ingress protection is IP65.

Connecting with single strands for operation is not needed as pre-assembled cables can be used.



Connection head with M12 x 1 coupler connector (4-pin)

Connection head with digital indicator (option)

As an alternative to the standard connection head, the thermometer can be fitted with an optional DIH10 digital indicator. The connection head used for this is similar to the model BSZ-H head. For operation, a 4 ... 20 mA transmitter is needed, which is mounted to the measuring insert. The indication range is configured identically to the measuring range of the transmitter.



Connection head with digital indicator, model DIH10

Transmitter (option)

Depending on the connection head used, a transmitter can be mounted within the thermometer.

- Mounted instead of terminal block
- Mounted within the cap of the connection head
- Mounting not possible

Mounting of 2 transmitters on request.

| Connection head | Transmitter model | | | |
|-----------------|-------------------|-----|-----|--------|
| | T15 | T32 | T53 | T91.10 |
| BVC | ○ | ○ | ○ | ○ |
| BVS | ○ | ○ | ○ | ○ |
| BS | - | - | ○ | ○ |
| BSZ / BSZ-K | ○ | ○ | ○ | ○ |
| BSZ-H / BSZ-HK | ● | ● | ● | ● |
| BSS | ○ | ○ | ○ | ○ |
| BSS-H | ● | ● | ● | ● |

| Model | Description | Explosion protection | Data sheet |
|--------|--|----------------------|------------|
| T15 | Digital transmitter, PC configurable | Optional | TE 15.01 |
| T32 | Digital transmitter, HART® protocol | Optional | TE 32.04 |
| T53 | Digital transmitter, FOUNDATION™ Fieldbus and PROFIBUS® PA | Standard | TE 53.01 |
| T91.10 | Analogue transmitter, fixed measuring range | Without | TE 91.01 |

BioControl® connection

The flange connection is designed for fitting to the model 910.60 NEUMO BioControl® system.

BioControl® connection

Size 25, 50 and 65

Wetted material

Stainless steel 1.4435

Wetted surface

Versions:

- 0.8 µm (standard)
- 0.4 µm
- 0.4 µm electropolished
- 0.25 µm mechanical- and electropolished

Sealing (available as an option)

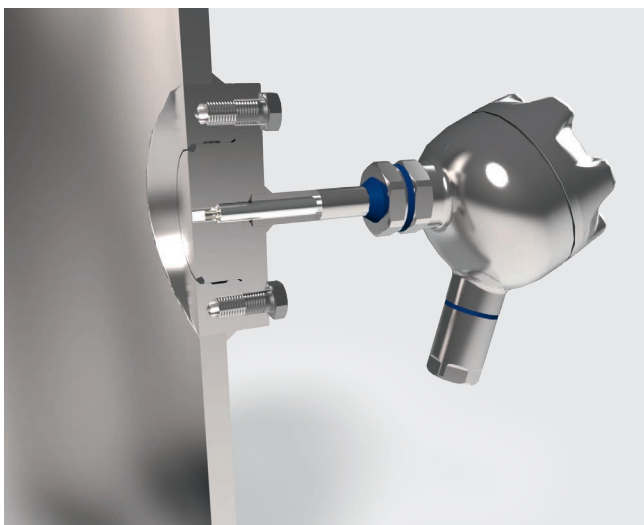
EPDM or FEP with FPM core

(both materials are FDA approved)

Nominal pressure

PN 16

Installation example: mounting in a vessel



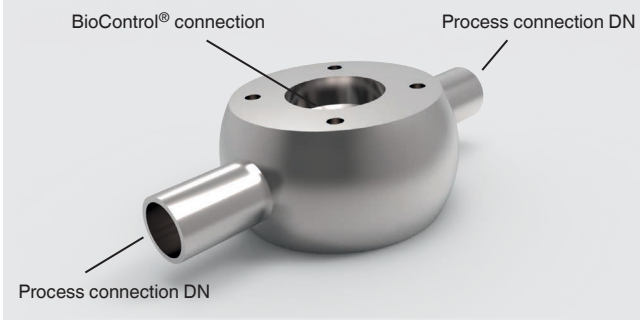
For flush instrumentation of a vessel with wipers, the TR20 in conjunction with a BioControl® block flange (B) is suitable. For this, the block flange is flush-welded into the vessel wall from the inside and then smoothed down.

After fitting the TR20, the user has an easily cleanable, flush measuring point, without any invasive components. With this design, the temperature of the process medium can be determined directly at the inner wall of the vessel.

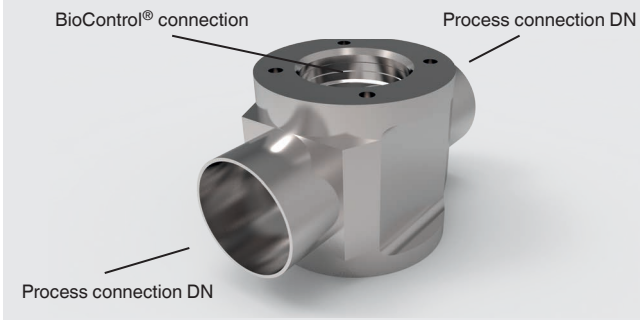
BioControl® case

The case of the NEUMO BioControl® system is not part of the scope of delivery of the resistance thermometer described here, and can be ordered as an additional item. For a detailed description of this case, see data sheet AC 09.14.

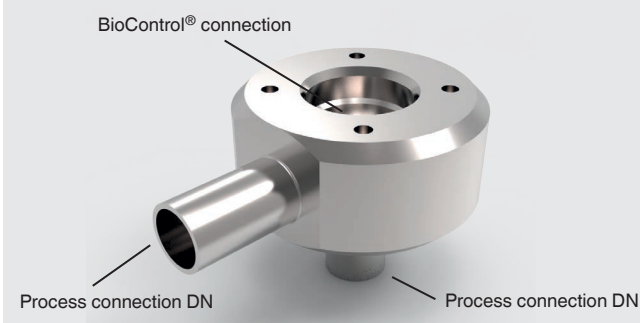
Case type (G), size 25



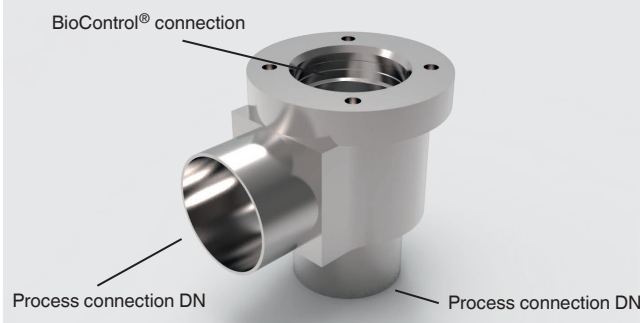
Case type (G), sizes 50 and 65



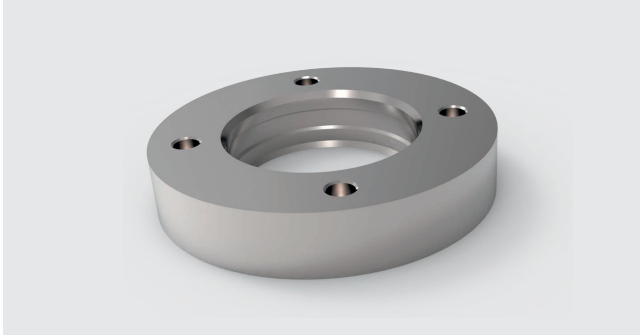
Case type - angled variant (U), size 25



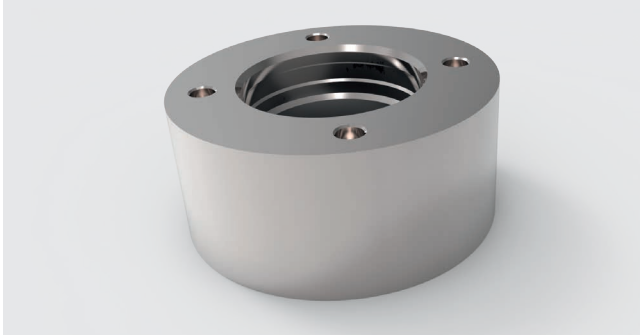
Case type - angled variant (U), sizes 50 and 65



Block flange (B) variant, low-profile version

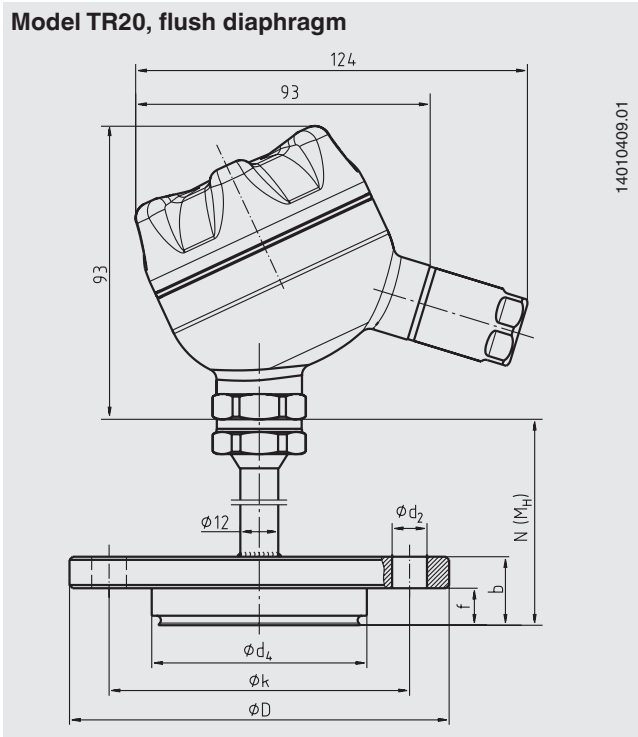


Block flange (B) variant, high version



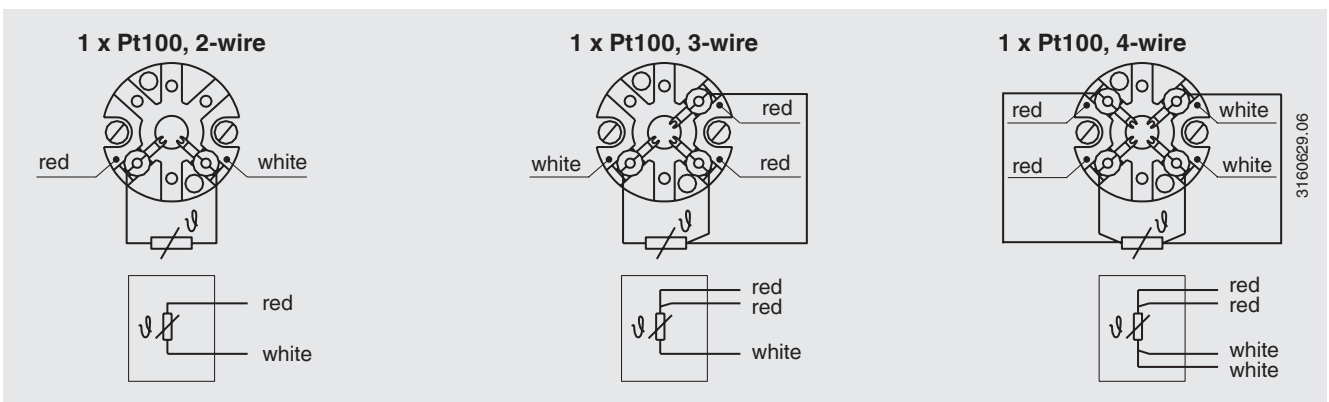
Dimensions in mm

Model TR20, flush diaphragm



| BioControl® connection | Dimensions in mm | | | | | | Weight in kg |
|------------------------|------------------|------------|----------|----|----|----------|--------------|
| Size | ϕd_2 | ϕd_4 | ϕD | f | b | ϕk | |
| 25 | 4 x $\phi 7$ | 30.5 | 64 | 11 | 20 | 50 | 1.0 |
| 50 | 4 x $\phi 9$ | 50 | 90 | 17 | 27 | 70 | 1.4 |
| 65 | 4 x $\phi 11$ | 68 | 120 | 17 | 27 | 95 | 2.0 |

Electrical connection



For the electrical connections of built-in temperature transmitters see the corresponding data sheets or operating instructions.










Explosion protection (option)





Resistance thermometers of the TR20 series are available with an EC-type examination certificate for “intrinsically safe”, Ex i, ignition protection. These instruments comply with the requirements of the ATEX directive for gas.

The permissible power, P_{max}, as well as the permissible ambient temperature, for the respective category can be seen on the EC-type examination certificate and the certificate for hazardous areas or the operating instructions.

Built-in transmitters have their own EC-type examination certificate. The permissible ambient temperature ranges of the built-in transmitters can be taken from the corresponding transmitter approval. The system operator is responsible for using suitable thermowells.

Approvals

| Logo | Description | Country |
|---|---|-----------------------------|
|  | EU declaration of conformity <ul style="list-style-type: none"> ■ EMC directive ¹⁾ EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ RoHS directive ■ ATEX directive (option) Hazardous areas Zone 0 gas [II 1G Ex ia IIC T1 ... T6 Ga] Zone 1 gas [II 2G Ex ia IIC T1 ... T6 Gb] | European Union |
|  | | |
|  | IECEx (option) - in conjunction with ATEX Hazardous areas Zone 0 gas [Ex ia IIC T1 ... T6 Ga] Zone 1 gas [Ex ia IIC T1 ... T6 Gb] | International |
|  | EAC (option) <ul style="list-style-type: none"> ■ EMC directive ¹⁾ ■ Hazardous areas Zone 0 gas [0 Ex ia IIC T3/T4/5/T6] Zone 1 gas [1 Ex ib IIC T3/T4/5/T6] | Eurasian Economic Community |
|  | DNOP - MakNII (option) Hazardous areas Zone 0 gas [II 1G Ex ia IIC T3, T4, T5, T6 Ga] Zone 1 gas [II 2G Ex ia IIC T3, T4, T5, T6 Gb] | Ukraine |
|  | INMETRO (option) Hazardous areas Zone 0 gas [Ex ia IIC T3 ... T6 Ga] Zone 1 gas [Ex ib IIC T3 ... T6 Gb] | Brazil |
|  | KCs - KOSHA (option) Hazardous areas Zone 0 gas [Ex ia IIC T4 ... T6] Zone 1 gas [Ex ib IIC T4 ... T6] | South Korea |
| - | PESO - CCOE (option) Hazardous areas Zone 0 gas [Ex ia IIC T1 ... T6 Ga] Zone 1 gas [Ex ia IIC T1 ... T6 Gb] | India |
|  | GOST (option) Metrology, measurement technology | Russia |
|  | KazInMetr (option) Metrology, measurement technology | Kazakhstan |
| - | MTSCHS (option) Permission for commissioning | Kazakhstan |

| Logo | Description | Country |
|---|---|------------|
|  | BelGIM (option) Metrology, measurement technology | Belarus |
|  | UkrSEPRO (option) Metrology, measurement technology | Ukraine |
|  | Uzstandard (option) Metrology, measurement technology | Uzbekistan |
|  | 3-A (option) ²⁾ Sanitary Standard | USA |

1) Only for built-in transmitter

2) Confirmation of 3-A conformity only valid with separately selectable 2.2 test report

Instruments marked with "ia" may also be used in areas only requiring instruments marked with "ib" or "ic".

If an instrument with "ia" marking has been used in an area with requirements in accordance with "ib" or "ic", it can no longer be operated in areas with requirements in accordance with "ia" afterwards.

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate
- DKD/DAkkS calibration certificate
- Manufacturer's declaration regarding regulation (EC) 1935/2004
- Certificate of the surface roughness of wetted parts
- Hygienic design conformity

Approvals and certificates, see website

Patents, property rights

Case with easily cleanable twist crown, integrated into the case cap (GM 000984349)

Ordering information

Model / Connection head / Cable outlet of connection head / Terminal block, transmitter / Process connection / Surface of wetted parts / Neck tube / Measuring element / Connection method / Temperature range / Certificates / Options

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