

# Intrinsically Safe Pressure Transmitter for highest pressure applications in hazardous environments Model IS-20-H

WIKA Data Sheet PE 81.51



## Applications

- Chemical and petro chemical industry
- Polyethylene production plants

## Special Features

- Pressure ranges from 0 ... 1600 bar to 0 ... 6000 bar
- Sensor stayed via sealing cone
- Ex- protection Ex ia I/II C T6 in compliance with ATEX: Gases, vapours and mist: Zone 0, Zone 1 and Zone 2
- FM, CSA approval for
  - Intrinsic safe Class I, II and III Division 1, Group A, B, C, D, E, F, G
  - Dust Class II and III Division 1, Group E, F, G
  - Class I, Zone 0, AEx ia II C



Fig. left: IS-20-H with L-connector  
Fig. right: IS-20-H with fieldcase

## Description

### Global explosion protection

These pressure transmitters meet approvals such as ATEX, FM, CSA, which are relevant throughout the world. All data required in connection with the approval is included on the product label. The globality of the product is thus given special emphasis.

### Structure

All wetted parts materials are specially suited for extremely high pressure ranges. The rugged case is made of stainless steel and provides at least IP 65 ingress protection (special versions up to IP 67).

The transmitters are supplied via appropriate intrinsically safe line transformers, or via typical zener diode barriers with an input power of 10 ... 30 V. The output signal is 4 ... 20 mA, 2-wire.

### High permanent load stability

Due to the specially clamped sensor element a high stability to permanent load cycles is achieved even in highly dynamic processes. Furthermore, the well-proven WIKA technology guarantees high accuracy and longterm stability of the pressure transmitters.

As several pressure and electrical connections are possible, the user can find the optimal solution for his measuring task.

This product is a combination of the excellent approval-relevant features of the intrinsically safe pressure transmitter and superior high pressure characteristics.

# Specifications

# Model IS-20-H

Specifications without model designation apply for all models.

Pressure ranges	bar	1600	2500	4000	5000	6000
Over pressure safety	bar	2300	3500	5000	6000	7000
Burst pressure	bar	4000	6000	8000	10000	11000
Materials						
■ Wetted part		Stainless steel				
■ Case		Stainless steel				
Power supply $U_B$	$U_B$ in VDC					
» Model IS-20-H		10 ... 30				
» Model IS-20-H with fieldcase		11 ... 30				
Signal output and maximum ohmic load $R_A$	$R_A$ in Ohm	4 ... 20 mA, 2-wire				
» Model IS-20-H		$R_A \leq (U_B - 10 \text{ V}) / 0.02 \text{ A}$ - (length of flying leads in m x 0.14 Ohm)				
» Model IS-20-H with fieldcase		$R_A \leq (U_B - 11 \text{ V}) / 0.02 \text{ A}$				
Test circuit signal / max. load $R_A$		$R_A \leq 15 \text{ Ohm}$ (only model IS-20-H with fieldcase)				
Adjustability zero/span	%	$\pm 5$ using potentiometers inside the instrument				
Response time (10 ... 90 %)	ms	$\leq 1$				
Power $P_i$	W	1 (750 mW with approval for Category 1D)				
Insulation voltage		Insulation complies with EN 60079-11				
Accuracy	%	$\leq 0.25$ (BFSL)				
	% of span	$\leq 0.5$ <sup>1)</sup>				
		<sup>1)</sup> Including non-linearity, hysteresis, zero point and full scale error (corresponds to error of measurement per IEC 61298-2)				
		Adjusted in vertical mounting position with lower pressure connection				
Non-linearity	% of span	$\leq 0.2$ (BFSL) according to IEC 61298-2				
Non-repeatability	% of span	$\leq 0.1$				
1-year stability	% of span	$\leq 0.2$ (at reference conditions)				
Permissible temperature of						
■ Medium <sup>2) 4)</sup>		-20 ... +80 °C <sup>3)</sup>		-4 ... +176 °F <sup>3)</sup>		
■ Ambience <sup>2) 4)</sup>		-20 ... +80 °C <sup>3)</sup>		-4 ... +176 °F <sup>3)</sup>		
■ Storage <sup>2)</sup>		-30 ... +105 °C		-22 ... +221 °F		
		<sup>2)</sup> Also complies with EN 50178, Tab. 7, Operation (C) 4K4H, Storage (D) 1K4, Transport (E) 2K3				
		<sup>3)</sup> Other temperature ranges are possible, depending on the electrical connection; see EC-type examination certificate, e.g. -30 ... +105 °C / -22 ... +221 °F and table page 5.				
Rated temperature range		0 ... +80 °C		+32 ... +176 °F		
Temperature coefficients within rated temperature range						
■ Mean TC of zero	% of span	$\leq 0.2 / 10 \text{ K}$				
■ Mean TC of range	% of span	$\leq 0.2 / 10 \text{ K}$				
CE-conformity						
■ Pressure equipment directive		97/23/EC				
■ EMC directive		2004/108/EC, EN 61 326 Emission (Group 1, Class B) and Immunity (industrial locations)				
■ Directive ATEX of equipment intended for use in potentially explosive atmospheres		94/9/EC				
Ex-protection	ATEX	Category <sup>4)</sup> 1/2G, 2G, M1, M2				
Ignition protection type		Ex ia I/II C T4, Ex ia I/II C T5, Ex ia I/II C T6				
		<sup>4)</sup> Read the operating conditions and <b>safety-relevant data</b> in the <b>EC-type examination certificate in any case</b> (BVS 04 ATEX E 068 X)				
Ex-protection	FM, CSA	Class I, II and III				
Ignition protection type		Intrinsic safe Class I, II, III Division 1, Group A, B, C, D, E, F, G and Class I, Zone 0 AEx ia II C				
HF-immunity	V/m	10				
Burst	kV	2				
Shock resistance	g	100 according to IEC 60068-2-27 (mechanical shock)				
Vibration resistance	g	5 according to IEC 60068-2-6 (vibration under resonance)				

## Specifications

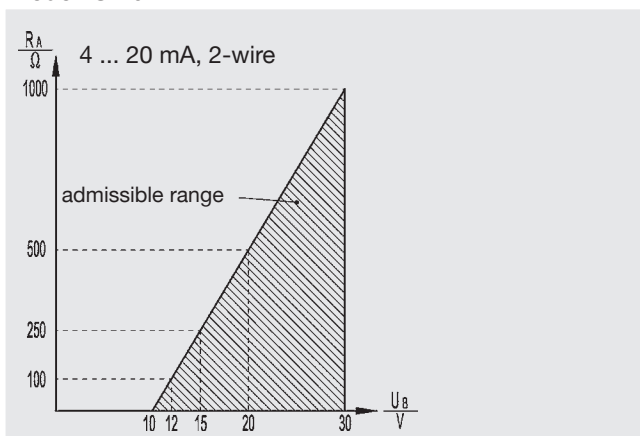
## Model IS-20-H

Wiring protection		
■ Short-circuit proofness		Sig+ towards UB-
■ Reverse polarity protection		UB+ towards UB-
Weight		
» Model IS-20-H	kg	Approx. 0.3
» Model IS-20-H with fieldcase	kg	Approx. 0.45

{ } Items in curved brackets are optional extras for additional price.

## Output signal and admissible load

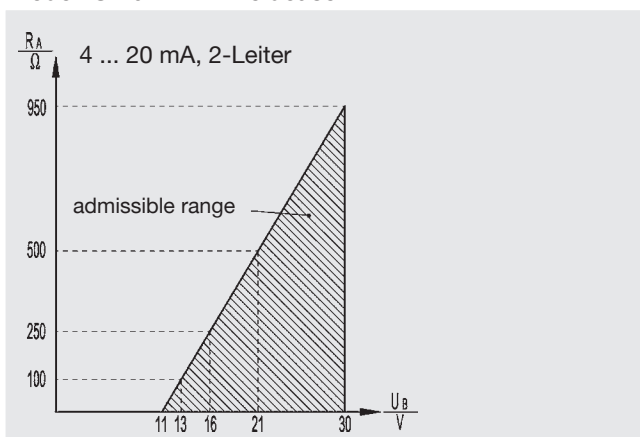
### Model IS-20-H



Output current (2-wire)

$$4 \dots 20 \text{ mA: } R_A \leq (U_B - 10 \text{ V}) / 0.02 \text{ A}$$

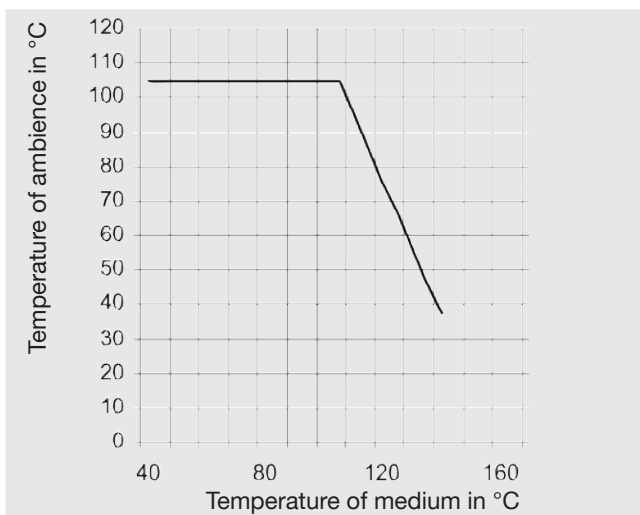
### Model IS-20-H with fieldcase



Output current (2-wire)

$$4 \dots 20 \text{ mA: } R_A \leq (U_B - 11 \text{ V}) / 0.02 \text{ A}$$

## Relation of medium temperature to ambient temperature



### Calculation of operation temperatur:

$$T_B = T_{med} - (T_{med} - T_{amb}) \times 0.34$$

$T_B$  = Operation temperature of transmitter

$T_{med}$  = Max. temperature of process medium

$T_{amb}$  = Max. temperature of ambience

### Max. permitted temperature of ambience:

$$T_{amb} = T_{med} + (T_B - T_{med}) / 0.34$$

## Dimensions in mm

Permissible temperature ranges depending on electrical connections; see table page 5.

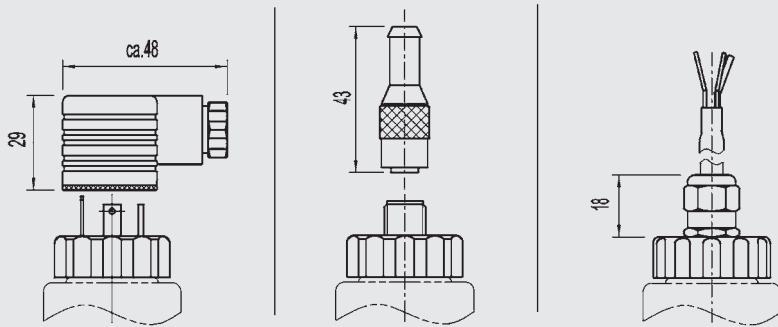
### Electrical connections

#### IS-20-H

DIN 175301-803 A  
L-connector  
Order code: A4  
ATEX: 1/2 G, M1

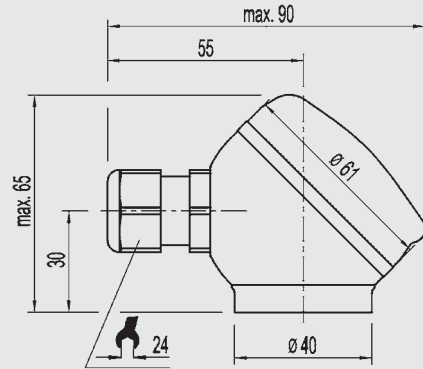
M 12x1  
Circular connector  
Order code: M4  
ATEX: 1/2 G, M1  
\*)

Flying leads  
for conductor cross section  
0.5 mm<sup>2</sup>, AWG 20 with end  
splices, conductor outer  
diameter 6.8 mm,  
PUR  
IP 67  
Order code: DL  
ATEX: 1/2 G, M1

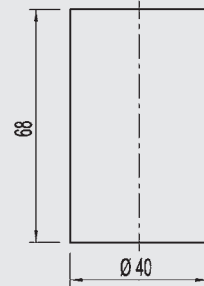
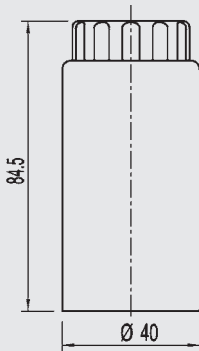


#### IS-20-H fieldcase

Fieldcase with internal spring clip  
terminals,  
Order code:  
FH (threaded connection brass nickel-  
plated)  
FC (threaded connection stainless steel)  
ATEX: 1/2 G, M1



### Case

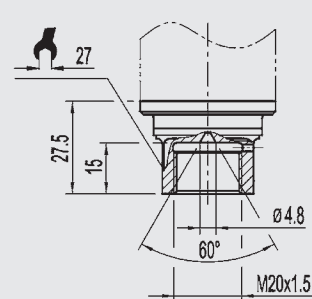
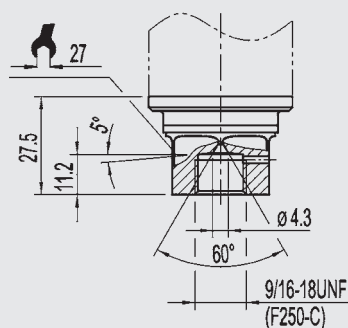
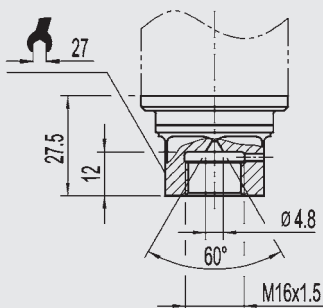


### Pressure connections

M 16x1,5 female \*\*)  
Order code: ML

9/16 - 18 UNF female  
F 250-C \*\*)  
Order code: VZ

M 20x1,5 female \*\*)  
Order code: MP



For installation and safety instructions see the operating instructions for this product.

For tapped holes and welding sockets please see Technical Information IN 00.14 for download at [www.wika.de](http://www.wika.de) -Service




\*) Connectors are not included in delivery.

\*\*) The respective values for your mounting position please find in the documentation of your high-pressure equipment supplier.

## Permissible temperature ranges depending on electrical connections

Electrical connections	Order-code	Category	Ambience-/ Medium temperature range	
DIN 175301-803 A L-Connector	A4	1/2 G (IIC)	-40 ... +60 °C (T6) -40 ... +80 °C (T5) -40 ... +105 °C (T4)	-40 ... +140 °F (T6) -40 ... +176 °F (T5) -40 ... +221 °F (T4)
		M1	-40 ... +105 °C	-40 ... +105 °F
M 12x1 Circular connector	M4	1/2 G (IIC)	-25 ... +60 °C (T6) -25 ... +80 °C (T5) -25 ... +90 °C (T4)	-13 ... +140 °F (T6) -13 ... +176 °F (T5) -13 ... +194 °F (T4)
		M1	-25 ... +90 °C	-13 ... +194 °F
Flying leads	DL	1/2 G (IIC)	-20 ... +60 °C (T6) -20 ... +80 °C (T5) -20 ... +80 °C (T4)	-4 ... +140 °F (T6) -4 ... +176 °F (T5) -4 ... +176 °F (T4)
		M1	-20 ... +60 °C	-4 ... +140 °F
Fieldcase	FH, FC	1/2 G (IIC)	-50 ... +60 °C (T6) -50 ... +80 °C (T5) -50 ... +105 °C (T4)	-58 ... +140 °F (T6) -58 ... +176 °F (T5) -58 ... +221 °F (T4)
		M1	-50 ... +105 °C (T4)	-58 ... +221 °F (T4)

## Wiring details

Wiring details							
	L-connector DIN 175301-803 A		Circular connector M12x1, 4-pin		Flying leads, 1.5 m	Field case (with internal spring clip terminals)	
							
2-wire	UB = 1	0V = 2	UB = 1	0V = 3	UB = brown 0V = green screen / case	UB = 1 Test- = 4	0V = 2 screen = 5 Test+ = 3
Wire gauge	up to max. 1.5 mm <sup>2</sup>		-		0.5 mm <sup>2</sup> (AWG 20)		
Cable diameter	6-8 mm ship approval: 10-14 mm		-		6.8 mm (Order code: DL)		7-13 mm
Ingress protection per IEC 60 529	IP 65		IP 67		IP 67		IP 67
The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.							

## Hazardous areas (zone classification according to ATEX)

**Group II:** Electrical equipment for use in all areas (except mines) which are endangered by an explosive atmosphere.

Zone	Category	Occurrence of explosive atmosphere
Zone 0	Category 1G (gas)	Continuous
Mounting to zone 0	Category 1/2 G	
Zone 1	Category 2G	Intermittent
Zone 2	Category 3G	Hazard under abnormal conditions

**Group I:** Electrical equipment for use in mines (hazard due to mine gas)

Zone	Category	Requirements
	Category M 1	Very high degree of safety
	Category M 2	High degree of safety (instruments have to be turned off if they are exposed to an explosive atmosphere)

## Hazardous areas (ATEX in comparison with FM, CSA)

		ATEX	FM / CSA	
		Group	Class	
Above ground	Gases and Vapours	IIA / IIB / IIC	I	A / B / C / D / E / F / G
	Dusts		II	
	Fasern		III	
Mining	Gas / Dusts	I	ID / IIF	

	Flammable material present continuously	Flammable material present intermittently	Flammable material normally not present
ATEX	Zone 0	Zone 1	Zone 2
FM / CSA	Zone 0	Zone 1	Zone 2
		Division 1	Division 2
FM (NEC505)	Zone 0	Zone 1	Zone 2

## Further information

You can obtain further information (data sheets, instructions, etc.) via our internet address [www.wika.de](http://www.wika.de)

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.

