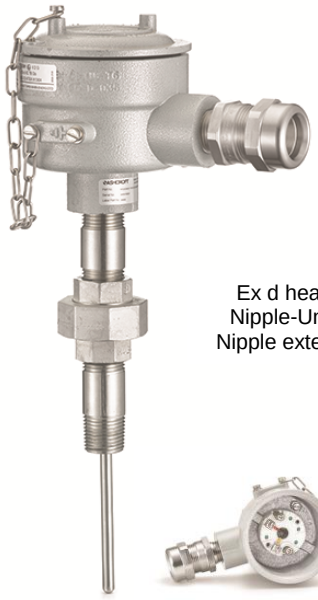
Type AR20 RTDs & AT20 Thermocouples, for Industrial Processes & Explosive Environments



Ex d head w
Nipple-Union-
Nipple extension

Interior View
Ex d head

BUZ head w
Nipple-Union-
Nipple extension

Interior View
BUZ head

APPLICATIONS

- ***Process temperature measurements for liquefied natural gas systems, and power generation systems.***
- ***Exhaust gas temperature measurements for hazardous environments.***
- ***Reactor measurements in petrochemical***

DESCRIPTION

The Ashcroft AT20 and AR20 temperature sensor assemblies provide accurate temperature measurements for applications that are located in hazardous environments. Each temperature sensor assembly consists of a spring loaded temperature sensor, magnesium oxide, MgO, insulated insert, connection head and lag extension. The assembly may also include an optional terminal block for wiring and/or transmitters.

Thermocouple assemblies are manufactured to either to IEC 60584-2 or ANSI MC 96.1 and RTDs assemblies are manufactured to IEC 60751.

For explosive environments, AR20 RTDs and AT20 thermocouples are available with ATEX or IECEx approvals that meet EN/IEC 60079-1 or EN/IEC 60079-11.

SPECIFICATIONS

1. **Ashcroft Series:** AT20 & AR20
2. **Insert Stem Diameter:**
   3 mm, 4.5 mm, 6 mm, 8 mm, $^{1}/_{8}$“, $^{3}/_{16}$“, ¼“
3. **Stem Length:**
   Minimum: 0.05 m / 2 in.
   Maximum: 100 m / 3937 in.
4. **Sensor Type & Measuring Range:**
   AR20 RTDs
   PT 100 -200 to +600 °C
   PT 1000 -40 to +600°C
   AT20 Thermocouples
   Type J -40 to +750 °C
   Type E -200 to +800 °C
   Type K -200 to +1100 °C
   Type N -200 to +1100 °C
5. **Wiring Configuration**
   AR20 RTDs
   2 wire
   3 wire
   4 wire
   AT20 Thermocouple
   2 wire
6. **Optional Approvals (pending)**
   IEC 60079-1
   ATEX: Ex ia IIC T6 Gb
   IECEx: Ex ia IIC T6 Ga
   EC 60079-11
   ATEX: EX ia IIC T6 Gb
   IECEx: Ex ia IIC T6 Ga
7. **Accuracy Class:**
   AR10 RTDs (IEC 60751)
   Class A: $\pm(0.15 + 0.0020 * |t|^{(1)})$
   Class B: $\pm(0.30 + 0.0050 * |t|^{(1)})$
   ½ Class B: $\pm(0.15 + 0.0025 * |t|^{(1)})$
   $^{1}/_{3}$ Class B: $\pm(0.10 + 0.0017 * |t|^{(1)})$

AT20 Thermocouples (IEC60584-2)

	Type J	Type K	Type T	Type E	Type N
Class 1	±1.5°C or ±0.0040*|t|(1)	±1.5°C or ±0.0040*|t|(1)	±0.5°C or ±0.0040*|t|(1)	±1.5°C or ±0.0040*|t|(1)	±1.5°C or ±0.0040*|t|(1)
Class 2	±2.5°C or ±0.0075*|t|(1)	±2.5°C or ±0.0075*|t|(1)	±1.0°C or ±0.0075*|t|(1)	±2.5°C or ±0.0075*|t|(1)	±2.5°C or ±0.0040*|t|(1)
Class 3	N/A	±2.5°C or ±0.0040*|t|(1)	±1.0°C or ±0.0150*|t|(1)	±2.5°C or ±0.0150*|t|(1)	±2.5°C or ±0.0150*|t|(1)

AT20 Thermocouples (ANSI MC 96.1)

	Type J	Type K	Type T	Type E	Type N
Standard	±2.2°C or ±0.0075*|t|(1)	±2.2°C or ±0.0075*|t|(1)	±1.0°C or ±0.0075*|t|(1)	±1.7°C or ±0.0050*|t|(1)	±2.2°C or ±0.0040*|t|(1)
Special	±1.1°C or ±0.0040*|t|(1)	±1.1°C or ±0.0040*|t|(1)	±0.5°C or ±0.0040*|t|(1)	±1.0°C or ±0.0040*|t|(1)	±1.1°C or ±0.0040*|t|(1)

(1) Absolute temperature in °C

Type AR20 RTDs Part Number Coding

1. TYPE

ITEM	DESCRIPTION
1	Standard
3	Ex ia IIC T6 Ga
D	Ex d IIC T6 Gb

2. STEM DIAMETER (e)

ITEM	DESCRIPTION
3	3 mm
4	4.5 mm
6	6 mm
8	8 mm
R	1/8"
S	3/16"
T	1/4"

3. SENSOR

ITEM	DESCRIPTION
1	Pt 100
2	Pt 1000

4. ACCURACY CLASS

ITEM	DESCRIPTION
A	Class A
B	Class B
C	1/2 Class B
D	1/3 Class B

5. SENSING ELEMENT

ITEM	DESCRIPTION
A	-50 to + 400 °C
B	-200 to +600 °C
D	Vibration resistant

6. WIRING CONFIGURATION

ITEM	DESCRIPTION
A	Single, 2 wire
B	Single, 3 wire
C	Single, 4 wire
D	Double, 2 wire
E	Double, 3 wire
F	Double, 4 wire

7. STEM MATERIAL

ITEM	DESCRIPTION
A	316L SS

8. HEAD TYPE

ITEM	DESCRIPTION
B	DIN B, Aluminum Alloy, IP66
D	BUZ, Aluminum Alloy, IP68
E	BUZH, Aluminum Alloy, IP68
F	Ex d, Aluminum Alloy, IP66
G	SCCI, 316S, IP67
N	SCCA, Aluminum Alloy, IP67

9. HEAD MOUNTING CONNECTION

ITEM	DESCRIPTION
2	1/2 NPT Female
N	3/4 NPT Female
M	M20 x 1.5
A	M20 x 1.5 adapter
P	PG 16

10. CABLE GLAND

ITEM	DESCRIPTION
O	None
P	Polyamide PA, for unarmored cable
L	Nickle plated brass, for unarmored cable
M	Nickel plated brass, single seal for armored cable
N	Nickel plated brass, double seal for armored cable
S	Stainless steel, for unarmored cable
T	Stainless steel, single seal for armored cable
U	Stainless steel, double seal for armored cable

11. LAG EXTENSION LENGTH (T)

ITEM	DESCRIPTION
T	(min. 0.05 – max. 1 m) M (min. 2 – max. 39 in.) E

12. LAG EXTENSION TYPE

ITEM	DESCRIPTION
H6	Nipple 316 SS / 1.4401 T = 0.04 m
H7	Nipple 316 SS / 1.4401 T = 0.1 m
H9	Nipple 316 SS / 1.4401 T = customer specified
J7	Nipple-Union-Nipple, 316 SS / 1.4401 T = 0.12 m
J9	Nipple-Union-Nipple, 316 S SS / 1.4401 T = customer specified
LH	Telescopic lag extension, 316 SS / 1.4401 T = 0.12 m
00	No lag extension, no plug
40	No lag extension with plug

13. PROCESS CONNECTION

ITEM	DESCRIPTION
R3	1/2 NPT male thread
C3	1/2 NPT male compression fitting 316 SS
00	No process connection

14. SENSOR MOUNTING BLOCK

ITEM	DESCRIPTION
0	Ceramic terminal block
1	Transmitter
2	Ceramic terminal with transmitter
3	No terminal block with flying leads

15. APPROVALS

ITEM	DESCRIPTION
0	None
A	ATEX
X	IECEx

16. CALIBRATION REPORT

ITEM	DESCRIPTION
00	None
3P	3 point report for single sensor
5P	5 point report for single sensor
3D	3 point report for double sensor
5D	5 point report for double sensor

17. NOMINAL LENGTH (S)

ITEM	DESCRIPTION
S	(min. 0.05 – max. 100 m) M (min. 2 – max. 3937 in.) E

18. OPTIONS

ITEM	DESCRIPTION
NH	Metal Tag

Order example:

AT20	1	3	E	1	1	A	A	B	M	0	T0.05M	H9	R3	1	X	3P	S0.2M	XNH
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	T[11]	[12]	[13]	[14]	[15]	[16]	S[17]	[18]
Model Type	Type	Stem Diameter	Sensor	Accuracy Class	Sensing Element	Wiring Config.	Stem Material	Head Type	Head Mounting	Cable Gland	Lag Extension Length	Lag Extension Type	Process Connection	Sensor Mounting Block	Approvals	Calibration Report	Nominal Length	Options
(AR20)	(1) (2) (3)	(3) (4) (6) (8) (R) (S) (T)	(E) (J) (K) (N)	(1) (2) (3) (A) (B)	(1) (2)	(A) (B) (C) (D) (E) (F)	(A)	(B) (D) (E) (F) (G) (N)	(2) (N) (M) (A) (P)	(0) (P) (L) (N) (S) (T) (U)	(T)	(H6) (H7) (H9) (J7) (J9) (LH) (00) (40)	(R3) (C3) (00)	(0) (1) (2) (3)	(00) (A) (X)	(00) (3P) (5P) (3D) (5D)	(S)	(NH)

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Type AT20 Thermocouples Part Number Coding

1. TYPE

ITEM	DESCRIPTION
1	Standard
3	Ex ia IIC T6 Ga
D	Ex d IIC T6 Gb

2. STEM DIAMETER (e)

ITEM	DESCRIPTION
3	3 mm
4	4.5 mm
6	6 mm
8	8 mm
R	1/8''
S	3/16''
T	1/4''

3. SENSOR

ITEM	DESCRIPTION
E	Type E (-200 to +800 °C)
J	Type J (-40 to 750 °C)
K	Type K (-200 to +1100 °C)
N	Type N (-200 to + 1100 °C)

4. ACCURACY CLASS

ITEM	DESCRIPTION
1	Class 1, IEC 60584-2
2	Class 2, IEC 60584-2
3	Class 3, IEC 60584-2
A	Standard, ANSI MC 96.1
B	Special, ANSI MC 96.1

5. SENSING ELEMENT

ITEM	DESCRIPTION
1	Insulated
2	Grounded
3	Insulated with vibration resistance
4	Grounded with vibration resistance

6. WIRING CONFIGURATION

ITEM	DESCRIPTION
1	Single
2	Double

7. STEM MATERIAL

ITEM	DESCRIPTION
1	316L SS
3	Inconel 600

8. HEAD TYPE

ITEM	DESCRIPTION
B	DIN B, Aluminum Alloy, IP66
D	BUZ, Aluminum Alloy, IP68
E	BUZH, Aluminum Alloy, IP68
F	Ex d, Aluminum Alloy, IP66
G	SCCI, 316S, IP67
N	SCCA, Aluminum Alloy, IP67

9. HEAD MOUNTING CONNECTION

ITEM	DESCRIPTION
2	1/2 NPT Female
N	3/4 NPT Female
M	M20 x 1.5
A	M20 x 1.5 adapter
P	Pg 16

10. CABLE GLAND

ITEM	DESCRIPTION
O	None
P	Polyamide PA, for unarmored cable
L	Nickle plated brass, for unarmored cable
M	Nickel plated brass, single seal for armored cable
N	Nickel plated brass, double seal for armored cable
S	Stainless steel, for unarmored cable
T	Stainless steel, single seal for armored cable
U	Stainless steel, double seal for armored cable

11. LAG EXTENSION LENGTH (T)

ITEM	DESCRIPTION
T	(min. 0.05 – max. 1 m) M (min. 2 – max. 39 in.) E

12. LAG EXTENSION TYPE

ITEM	DESCRIPTION
H6	Nipple 316 SS / 1.4401 T = 40 mm
H7	Nipple 316 SS / 1.4401 T = 100 mm
H9	Nipple 316 SS / 1.4401 T = customer specified
J7	Nipple-Union-Nipple, 316 SS / 1.4401 T = 120 m
J9	Nipple-Union-Nipple, 316 SS / 1.4401 T = customer specified
LH	Telescopic lag extension, 316 SS / 1.4401 T = 125 mm to 200 mm
00	No lag extension, no plug
40	No lag extension with plug

13. PROCESS CONNECTION

ITEM	DESCRIPTION
R3	1/2 NPT male thread
C3	1/2 NPT male compression fitting 316 SS
00	No process connection

14. SENSOR MOUNTING BLOCK

ITEM	DESCRIPTION
0	Ceramic terminal block
1	Transmitter
2	Ceramic terminal with transmitter
3	No terminal block with flying leads

15. APPROVALS

ITEM	DESCRIPTION
0	None
A	ATEX
X	IECEx

16. CALIBRATION REPORT

ITEM	DESCRIPTION
00	None
3P	3 point report for single sensor
5P	5 point report for single sensor
3D	3 point report for double sensor
5D	5 point report for double sensor

17. NOMINAL LENGTH (S)

ITEM	DESCRIPTION
S	(min. 0.05 – max. 100 m) M (min. 2 – max. 3937 in.) E

18. OPTIONS

ITEM	DESCRIPTION
NH	Metal Tag

Order example:

AR20	1	3	1	A	A	A	A	B	M	0	T0.05M	H9	R3	1	X	3P	S0.2M	XNH
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	T[11]	[12]	[13]	[14]	[15]	[16]	S[17]	[18]
Model Type	Type	Stem Diameter	Sensor	Accuracy Class	Sensing Element	Wiring Donfig.	Stem Material	Head Type	Head Mounting	Cable Gland	Lag Extension Length	Lag Extension Type	Process Connection	Sensor Mounting Block	Approvals	Calibration Report	Nominal Length	Options
(AR20)	(1) (2) (3)	(3) (4) (6) (8) (R) (S) (T)	(1) (2)	(A) (B) (C) (D)	(A) (B) (D)	(A) (B) (C) (D) (E) (F)	(A)	(B) (D) (E) (F) (G) (N)	(2) (N) (M) (A) (P)	(0) (P) (L) (N) (S) (T) (U)	(T)	(H6) (H7) (H9) (J7) (J9) (LH) (00) (40)	(R3) (C3) (00)	(0) (1) (2) (3)	(00) (A) (X)	(00) (3P) (5P) (3D) (5D)	(S)	(NH)

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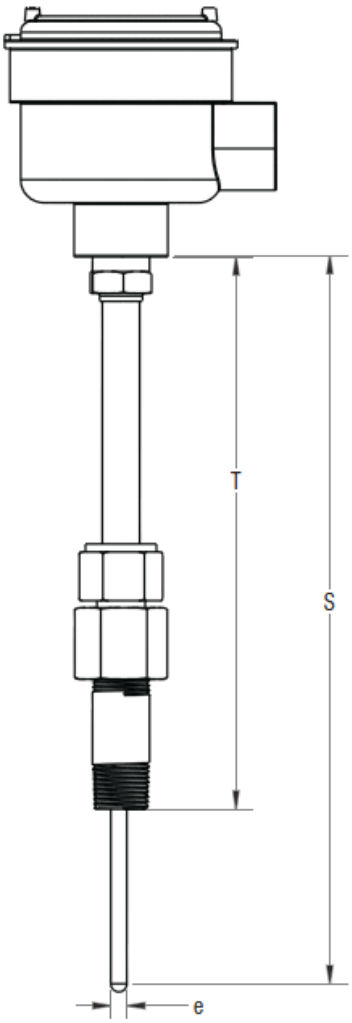
Type AT20 Thermocouples & Type AR20 RTDs

Dimension Drawing



e = Stem Diameter
T = Lag Extension Length
S = Nominal Length

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