

S10 RTD's & Thermocouples, Metric Connections

TYPICAL USES

- Process temperature measurements for industrial, process and power generation.
- Exhaust gas temperature measurements for diesel engines.
- Oven temperature measurements for industrial drying ovens.
- Special designs for intrinsically safe and non-incendive application.

DESCRIPTION

The Ashcroft S10 temperature sensor assemblies provide accurate temperature measurements for most applications. Each temperature sensor assembly consists of a spring loaded temperature sensor insert, a 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 RTD assemblies are manufactured to IEC 60751.



SPECIFICATIONS

Ashcroft Series:	S10
Sheath Diameter:	3 mm, 4.5 mm, 6 mm, 8 mm
Stem Length:	Minimum: 50 mm/2 in Maximum: 3 m/120 in
Sensor Type & Measuring Range	RTDs Platinum 385 Pt 100 -200 to +600°C Pt 1000 -40 to +600°C Thermocouples Type J -40 to +750°C Type E -200 to +800°C Type K -200 to +1000°C Type N -200 to +1000°C
Wiring Configuration:	RTDs single or dual 2 Wire 3 Wire 4 Wire Thermocouples Single or dual
Accuracy Class	(IEC 60751) Class A: $\pm(0.15 + 0.0020 * t ^{(1)})$ Class B: $\pm(0.30 + 0.0050 * t ^{(1)})$ 1/2 Class B: $\pm(0.15 + 0.0025 * t ^{(1)})$ 1/3 Class B: $\pm(0.10 + 0.0017 * t ^{(1)})$

KEY BENEFITS

- Flexible designs to work in most applications
- Designs for hazardous locations

Thermocouples (ANSI MC 96.1)

	Type J	Type K	Type E	Type N
Standard	$\pm 2.2^\circ\text{C}$ or $\pm 0.0075 * t ^{(1)}$	$\pm 2.2^\circ\text{C}$ or $\pm 0.0075 * t ^{(1)}$	$\pm 1.7^\circ\text{C}$ or $\pm 0.0050 * t ^{(1)}$	$\pm 2.2^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$
Special	$\pm 1.1^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$	$\pm 1.1^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$	$\pm 1.0^\circ\text{C}$ or $\pm 0.0075 * t ^{(1)}$	$\pm 1.1^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$

Thermocouples (IEC 60584-2)

	Type J	Type K	Type E	Type N
Class 1	$\pm 1.5^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$	$\pm 1.5^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$	$\pm 1.5^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$	$\pm 1.5^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$
Class 2	$\pm 2.5^\circ\text{C}$ or $\pm 0.0075 * t ^{(1)}$	$\pm 2.5^\circ\text{C}$ or $\pm 0.0075 * t ^{(1)}$	$\pm 2.5^\circ\text{C}$ or $\pm 0.0075 * t ^{(1)}$	$\pm 2.5^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$
Class 3	N/A	$\pm 2.5^\circ\text{C}$ or $\pm 0.0040 * t ^{(1)}$	$\pm 2.5^\circ\text{C}$ or $\pm 0.0150 * t ^{(1)}$	$\pm 2.5^\circ\text{C}$ or $\pm 0.0150 * t ^{(1)}$

(1) Absolute temperature in °C

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Optional S10 Heads


 BUZH-AL
 Type E

 BUZH-AL
 Type D

 DIN B
 Type B

 BBK-PA
 Type C

OPTIONAL APPROVALS

FM Intrinsically safe: Class I, Division 1, Groups A, B, C, D
 T4 for $-55^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$
 T5 for $-55^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
 T6 for $-55^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$

FM Nonincendive: Class I, Division 2, Groups A, B, C, D
 T4 for $-55^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$
 T5 for $-55^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
 T6 for $-55^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$

ATEX or IECEx: ATEX or IECEx
 II 1 G Ex ia IIC T6 Ga -50°C to $+60^{\circ}\text{C}$
 II 2 G Ex ib IIC T6 Gb -50°C to $+60^{\circ}\text{C}$
 II 2 G Ex e IIC T6 Gb -55°C to $+60^{\circ}\text{C}$

S10 RTD Probes

S10 RTD ORDERING CODE	Example:	S10	1	6	1	A	A	B	1	D	2	S	Continued on next page
Area Classification													
1 - Standard			1										
3 - Intrinsic Safety - ia													
B - Intrinsic Safety - ib													
E - Increased Safety													
N - Non-Incendive													
Sheath Diameter													
3 - 3 mm													
4 - 4.5 mm													
6 - 6 mm				6									
8 - 8 mm													
RTD Type													
1 - PT 100					1								
Accuracy or Class (IEC 60751)													
A - Class A							A						
B - Class B													
C - 1/2 DIN													
D - Class AA - 1/3 DIN													
RTD Element/Range													
A - -50/+400°C							A						
B - -200/+600°C													
D - vibrations-proof													
Electrical Circuit													
A - Single 2 wires													
B - Single 3 wires								B					
C - Single 4 wires													
D - Dual 2 wires													
E - Dual 3 wires													
F - Dual 4 wires													
Sheath Material													
1 - AISI 316L / 1.4404									1				
Head Type													
B - DIN B Aluminum													
D - BUZ Aluminum										D			
E - BUZH Aluminum													
C - BBK - Plastic													
Instrument Connection - 1/2 NPT Conduit Connection													
M - M20 x 1.5													
P - Pg 16													
2 - 1/2" NPT											2		
Head Conduit Gland													
- - Without													
P - Polyamide PA, for unarmored cable													
L - Nickel plated brass, for unarmored cable													
M - Nickel plated brass, single seal for armoured cable													
N - Nickel plated brass, double seal for armoured cable													
S - Stainless steel, for unarmored cable												S	
T - Stainless steel, single seal for armoured cable													
U - Stainless steel, double seal for armoured cable													

Data Sheet

S10 RTD Probes

S10 RTD ORDERING CODE	Example: (Cont'd)	X	C	-	52	R3	-	-	3P	T	N=27	LN=400
Inset Nominal Length												
X - LN=... (min=50, max=100000). (add actual length in mm LN=?? at the end of ordering code)												
Lag Length												
- Lag length (add actual length in mm N=?? At the end of code)												
X - N=... (min=50, max=1000)												
N - N= 150mm												
F - N= 16mm												
C - N= 27mm												
- - Without												
-												
Lag Extension												
F5 - DIN Ø11/7 AISI 316/ 1.4401 N=150												
F6 - DIN Ø14/11 AISI 316/ 1.4401 N=150												
F8 - DIN Ø11/7 AISI 316/ 1.4401 N=non std												
F9 - DIN Ø14/11 AISI 316/ 1.4401 N=non std												
51 - Threaded connection cyl.												
52 - Threaded connection conical												
-- - Without lag extension, without plug												
4- - Without lag extension, with plug												
Process Connection												
Q3 - Thread G½ A												
Q4 - Thread G¾ A												
S6 - Thread M14 x 1.5												
S7 - Thread M18 x 1.5												
R3 - Thread ½ NPT												
A3 - Compression fitting G ½ A, AISI 316												
C3 - Compression fitting ½" NPT, AISI 316												
-- - Without connection												
Electical Connection												
-- - With terminal block												
1 - With transmitter Not available with FM IS or NI approval												
3 - Without terminal block, with flying leads												
Certifications												
- - None required												
F - FM												
A - ATEX												
X - IECEX												
S - SIL 2 + ATEX												
I - INMETRO												
D - ATEX + IECEX												
2 - SIL 2												
P - EAC (Gost R) + Metrological Russia												
Calibration Report												
-- - Without												
3P - 3 points												
5P - 5 points												
3D - 3 points												
5D - 5 points												
Marking												
- - Without												
T - Label in stainless steel with tag												

Extension length in mm
 Nominal length in mm
 mm = inches x 25.4

Prices subject to change without notice • All prices subject to escalation

Data Sheet

S10 Thermocouples, Probes

S10 TC ORDERING CODE	Example:	S10	S	K	1	N	1	1	3	D	M	S	Continued on next page
Area Classification													
S - Standard - General Purpose			S										
J - Intrinsic Safety - ia													
B - Intrinsic Safety - ib													
E - Increased Safety													
N - Non-Incendive													
Sheath Diameter													
3 - 3 mm													
4 - 4.5 mm													
6 - 6 mm													
8 - 8 mm													
Thermocouple Type													
E - temperature range: -200...+ 800°C													
J - temperature range: -40...+ 750°C													
K - temperature range: -200...+ 1000°C													
N - temperature range: -200...+ 1000°C													
Accuracy or Class													
N - ANSI MC 96.1: cl. standard						N							
S - ANSI MC 96.1: cl. special													
1 - IEC 60584-2 : class 1													
2 - IEC 60584-2 : class 2													
3 - IEC 60584-2 : class 3													
Junction													
1 - ungrounded								1					
2 - grounded													
3 - ungrounded, vibrations-proof													
4 - grounded, vibrations-proof													
Electrical Circuit													
1 - Single									1				
2 - Dual													
Sheath Material													
1 - AISI 316 / 1.4401													
3 - Inconel 600 / 2.4816									3				
Head Type													
B - DIN B Aluminum													
D - BUZ Aluminum										D			
E - BUZH Aluminum													
C - BBK - Plastic													
Instrument Connection - ½ NPT Conduit Connection													
M - M20 x 1.5											M		
A - adapter M20x1.5													
P - Pg 16													
Head Conduit Gland													
-- Without													
P - Polyamide PA, for unarmored cable													
L - Nickel Plated Brass, for unarmored cable													
M - Nickel Plated Brass, single seal for armoured cable													
N - Nickel Plated Brass, double seal for armoured cable													
S - Stainless steel, for unarmored cable												S	
T - Stainless steel, single seal for armoured cable													
U - Stainless steel, double seal for armoured cable													

Data Sheet

S10 Thermocouples, Probes

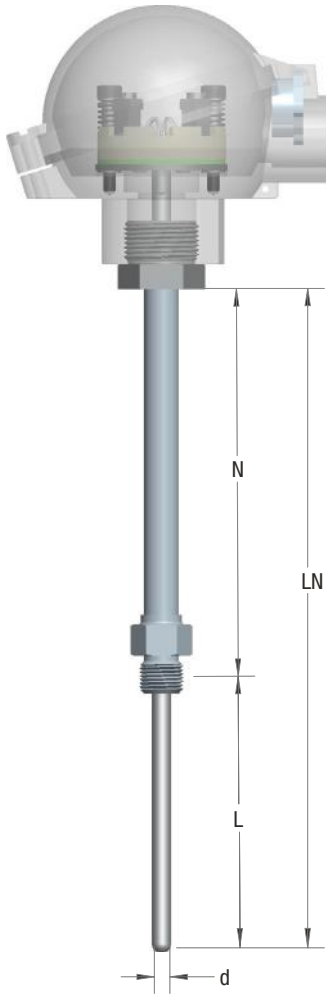
S10 RTD ORDERING CODE Example: (Cont'd)	X	C	-	52	R3	-	-	3P	T	N=27	LN=400
Inset Nominal Length										Extension length in mm	Nominal length in mm
X - LN=... (min=50, max=100000) (add actual length in mm LN=?? at the end of ordering code)	X										
Lag Length										mm = inches x 25.4	
-- Lag length (add actual length in mm N=?? At the end of code)											
X - N= ... (min=40, max=1000)		X									
N - N= 150mm											
F - N= 16mm											
C - N= 27mm											
- - Without											
-											
Lag Extension											
F5 - DIN Ø11/7 AISI 316/ 1.4401 N=150											
F6 - DIN Ø14/11 AISI 316/ 1.4401 N=150											
F8 - DIN Ø11/7 AISI 316/ 1.4401 N=non std					F8						
F9 - DIN Ø14/11 AISI 316/ 1.4401 N=non std											
51 - Threaded connection cyl.											
52 - Threaded connection conical											
- - Without lag extension, without plug											
4 - Without lag extension, with plug											
Process Connection											
Q3 - Thread G ½ A											
Q4 - Thread G ¾ A											
S6 - Thread M14 x 1.5											
S7 - Thread M18 x 1.5											
R3 - Thread ½ NPT					R3						
A3 - Compression fitting G ½ A, AISI 316											
C3 - Compression fitting ½ NPT, AISI 316											
-- Without connection											
Electical Connection											
- - With terminal block									-		
1 - With transmitter											
3 - Without terminal block, with flying leads											
Certifications											
- - None required										-	
F - FM											
A - ATEX											
X - IECEX											
S - SIL 2 + ATEX											
I - INMETRO											
D - ATEX + IECEX											
2 - SIL 2											
P - EAC (Gost R) + Metrological Russia											
Calibration Report											
-- Without											
3P - 3 points										3P	
5P - 5 points											
3D - 3 points											
5D - 5 points											
Tagging											
- - Without											
T - Label in stainless steel with tag										T	

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DIMENSIONS in [] are millimeters

For reference only, consult Ashcroft for specific dimensional drawings



HOW TO ORDER S10 TEMPERATURE PROBES:

- The ordering code is built by selecting the appropriate configuration for the various sections of the ordering code.
- The Insert nominal length LN is measured from base of the head to the tip of the probe.
- The lag extension length N is measured from the base of the head to the center of the threads on the lag extension.
- LN can be calculated by adding the lag extension length N to the probe insertion length L.
- The N length and the LN length are added to the end of the ordering code in millimeters.
- To convert inches to millimeters multiply by 25.4.
mm = inches x 25.4

d = Stem diameter

N = Lag Extension Length

L = Insertion Length

LN = Insert Nominal Length

LN = N + L