

Rosemount™ 9000 Series™ Magnetic Flow Sensors



The Rosemount 9205 Magnetic Flow Sensor is the cornerstone of the 9000 Series magnetic flow measurement system, delivering exceptional durability, precision, and ease of installation for a wide range of process applications. The 9205 provides a robust, integrated solution that ensures long-term accuracy and operational confidence, and is designed to pair seamlessly with the Rosemount 9732 Magnetic Flow Transmitter.

- **Enhanced Measurement Stability** – Optimized magnetic field design for consistent, accurate readings.
- **Rugged Construction** – Built to withstand harsh environments and aggressive process conditions.
- **Simplified Installation** – Designed to reduce installation effort and startup time.
- **Smart Integration** – Works in harmony with the diagnostics of the 9732 transmitter for proactive maintenance and reduced downtime.
- **Sustainability Focus** – Lower power consumption and improved efficiency support environmental and cost-saving goals.

Rosemount 9000 Series overview

The Rosemount 9000 Series Magnetic Flow Meters deliver next-generation performance, intelligent diagnostics, and exceptional ease of use to meet the evolving needs of modern flow measurement across industries.

Rosemount 9205 Magnetic Flow Sensor

Engineered with optimized magnetics and a redesigned housing, the 9205 sensor delivers faster, more stable magnetic field performance. It features simplified remote wiring and improved energy efficiency—ideal for hazardous environments and sustainability-focused operations.

Rosemount 9732 Magnetic Flow Transmitter

The 9732 transmitter brings high-speed processing, advanced diagnostics, and a streamlined user experience. It includes a Local Operator Interface (LOI) for intuitive configuration and troubleshooting, and a Universal Service Port for fast access to configuration files, logs, and firmware updates. It supports both AC and DC power, simplifying installation and reducing setup errors.

Refer to the *9000 Series Transmitter Product Data Sheet* for more information.

Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account.
- Improve mean time to repair and maintain efficiency.
- Ensure confidence that you have located the correct device.
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information.

Rosemount 9205 Magnetic Flow Sensor Features

	Design features	Standard process design
	Style	Flanged
	Base accuracy ⁽¹⁾	Standard: 0.25% High Accuracy: 0.15%
	Line sizes	½ in. to 8 in. (15 mm to 200 mm)
	Detailed specifications	Rosemount 9205 Magnetic Flow Sensor specifications
	Ordering information	Ordering 9205 Sensor

For complete accuracy specifications, refer to the [9205 Product Data Sheet](#).

Optimized magnetic design

Delivers stable, accurate flow measurement across a wide range of process conditions.

Enhanced durability

Rugged construction engineered to withstand harsh environments and aggressive media.

Line size availability

Currently available in ½" to 8" sizes.

Simplified remote wiring

Streamlines installation and enhances safety by eliminating hot work requirements in hazardous areas.

Reduced power consumption

Supports sustainability goals with energy-efficient design.

Advanced diagnostics integration

Seamlessly pairs with Rosemount 9732 transmitter diagnostics, including Smart Meter Verification and Coated Electrode Detection, to support proactive maintenance and sustained measurement performance.

Rosemount 9205 Magnetic Flow Sensor selection

Selecting the appropriate sensor size, material of construction, and process reference grounding are important steps when considering a magnetic flow meter. Emerson highly recommends sizing each sensor and configuring a complete model code using the Sizing and Selection Tool.

Magnetic flow meter sizing

Consider the physical properties of the process fluid, as well as the fluid velocity. It may be necessary to select a flow sensor that is larger or smaller than the adjacent piping to ensure the fluid velocity is in the recommended flow range for the application.

Table 1: Sizing Guidelines

Application	Velocity range (ft/s)	Velocity range (m/s)
Full range	0 to 39	0 to 12
Preferred service	2 to 20	0.6 to 6.1
Abrasive slurries	3 to 10	0.9 to 3.1
Non-abrasive slurries	5 to 15	1.5 to 4.6

Note:

Operation outside these guidelines may also give acceptable performance.

To convert flow rate to velocity, use the appropriate factor listed in Table 2 and the following equation:

$$\text{Velocity} = \frac{\text{Flow Rate}}{\text{Conversion Factor}}$$

Example: Imperial units	Example: SI units
Magmeter size: 4 in. (factor from Table 2 = 39.679) Normal flow rate: 300 gpm $\text{Velocity} = \frac{300 \text{ (gpm)}}{39.679}$ Velocity = 7.56 ft/s	Magmeter size: 100 mm (factor from Table 2 = 492.78) Normal flow rate: 800 L/min $\text{Velocity} = \frac{800 \text{ (L/min)}}{492.78}$ Velocity = 1.62 m/s

Table 2: Line Size vs. Conversion Factor

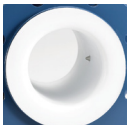
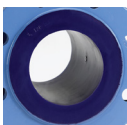
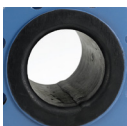
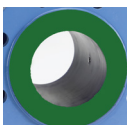
Nominal line size in inches (millimeters)	Gallons per minute (gpm) factor	Liters per minute (L/min) factor
½ (15)	0.947	11.762
1 (25)	2.694	33.455
1½ (40)	6.345	78.806
2 (50)	10.459	129.89
2½ (65)	14.923	185.33
3 (80)	23.042	286.17
4 (100)	39.679	492.78
6 (150)	90.048	1,118.3
8 (200)	155.93	1,936.5

Table 3: Line Size vs. Velocity/Rate

Nominal line size in inches (mm)	Minimum/maximum flow rate							
	Gallons per minute (gpm)				Liters per minute (L/min)			
	@ 0.04 ft/s (lowflow cutoff)	@ 1 ft/s (minimum range setting)	@ 3 ft/s	@ 39.37 ft/s (maximum range setting)	@ 0.01 2 m/s (lowflow cutoff)	@ 0.3 m/s (minimum range setting)	@ 1 m/s	@ 12 m/s (maximum range setting)
½ (15)	0.038	0.947	2.841	37.287	0.141	3.529	11.76	141.15
1 (25)	0.108	2.694	8.081	106.05	0.401	10.04	33.45	401.46
1½ (40)	0.254	6.345	19.04	249.82	0.946	23.64	78.81	945.67
2 (50)	0.418	10.459	31.38	411.77	1.559	38.97	129.89	1,558.7
2½ (65)	0.922	23.042	69.13	907.17	3.434	85.85	286.17	3,434.0
3 (80)	1.587	39.679	119.04	1,562.2	5.913	147.84	492.78	5,913.4
4 (100)	2.494	62.356	187.07	2,454.9	9.293	232.33	774.42	9,293.0
6 (150)	3.602	90.048	270.14	3,545.2	13.42	335.50	1,118.3	13,420
8 (200)	6.237	155.93	467.79	6,138.9	23.24	580.96	1,936.5	23,238

Material selection

Lining material selection

Liner material	General characteristics
PFA+ 	Best chemical resistance
	Better abrasion resistance than PTFE
	Best high temperature capabilities
	Process temperature: -58 to +350 °F (-50 to +177 °C)
PTFE 	Highly chemical resistant
	Excellent high temperature capabilities
	Process temperature: -58 to +350 °F (-50 to +177 °C)
Polyurethane 	Limited chemical resistance
	Excellent abrasion resistance for slurries with small and medium particles
	Process temperature: 0 to +140 °F (-18 to +60 °C)
	Typically applied in clean water
Neoprene 	Very good abrasion resistance for small and medium particles
	Better chemical resistance than polyurethane
	Typically applied in water with chemicals, and sea water
	Preferred liner for high pressure > ASME B16.5 Class 900
	Process temperature: 0 to +176 °F (-18 to +80 °C)
Linatex Rubber 	Limited chemical resistance especially in acids
	Very good abrasion resistance for large particles
	Softer material than polyurethane and neoprene
	Typically applied in mining slurries
	Process temperature: 0 to +158 °F (-18 to +70 °C)
Adiprene 	Ideal for applications with high salinity and/or hydrocarbon carryover
	Excellent abrasion resistance
	Typically used for water injection, recovered water, and coal gasification slurries
	Preferred liner for high pressure > ASME B16.5 Class 900
	Process temperature: 0 to +200 °F (-18 to +93 °C)
PEX 	Typically applied in general purpose water, wastewater, sea water, including applications where chemicals may be present
	Excellent abrasion resistance
	Good high temperature capabilities
	Process temperature: 0 to +203 °F (-18 to +95 °C)

Electrodes

Table 3-4: Electrode Material

Electrode material	General characteristics
316L stainless steel	Good corrosion resistance
	Good abrasion resistance
	Not recommended for sulfuric or hydrochloric acids
Nickel alloy 276	Better corrosion resistance
	High strength
	Good in slurry applications
	Effective in oxidizing fluids
Tantalum	Excellent corrosion resistance
	Not recommended for hydrofluoric acid, fluorosilic acid, or sodium hydroxide
80% platinum 20% iridium	Best chemical resistance
	Expensive material
	Not recommended for aquaregia
Titanium	Better chemical resistance
	Better abrasion resistance
	Good for sea water applications
	Not recommended for hydrofluoric or sulfuric acid
Tungsten-carbide coated	Limited chemical resistance
	Best abrasion resistance
	High concentration slurries
	Preferred electrode for oil and gas fracturing applications

Table 3-5: Electrode Type

Electrode type	General characteristics
Standard measurement	Lowest cost
	Good for most applications
Measurement + third electrode	Best performing grounding option for lined or non-conductive piping
	Low cost grounding option especially for large line sizes
Bullet-nose	Extended head protrudes into the flow stream for self-cleaning
	Best option for coating processes
Flat head	Low profile head
	Best option for abrasive slurries

Sensor process reference grounding

In addition to grounding required by applicable safety/electrical standards or codes, a reliable process reference ground path is required between the sensor and the process fluid.

Emerson provides grounding straps with every sensor to establish a process reference between the fluid and the transmitter.

Optional process reference electrode, grounding rings, and lining protectors are available with the sensor to ensure proper process reference grounding.

Process reference electrode (optional)

A process reference electrode can be installed similarly to the two measurement electrodes through the sensor lining. It is made of the same material as the measurement electrodes and utilizes floating reference ground.

Grounding rings (optional)

Grounding rings can be installed between the flange and the sensor face on both ends of the sensor. Single ground rings can be installed on either end of the sensor.

Grounding rings have an inner dimension (I.D.) slightly larger than the sensor I.D. and an external tab to attach ground straps. Grounding rings are available in 316L SST, Nickel Alloy 276, titanium, and tantalum.

Lining protectors (optional)

Lining protectors can be installed between the flange and the sensor face on both ends of the sensor.

The leading edge of lining material is protected by the lining protector; lining protectors cannot be removed once they are installed. Lining protectors are available in 316L SST, Nickel Alloy 276, and titanium.

Table 3-6: Process Reference Options

Grounding options	General characteristics
No grounding options (grounding straps)	Acceptable for conductive unlined pipe
	Grounding straps provided at no cost
Reference electrode	Same material as measurement electrodes
	Best performing grounding option for lined or non-conductive piping
	Acceptable in electrolytic and galvanic corrosion applications
Grounding rings	Low conductivity process fluids
	Cathodic or electrolysis applications that may have stray currents in or around the process
	Variety of materials for process fluid compatibility
Lining protectors	Protect upstream edge of sensor from abrasive fluids
	Permanently installed on sensor
	Protect liner material from over torquing of flange bolts
	Provide ground path and eliminate need for grounding rings or reference electrode
	Required for applications where Flexitallic gaskets are used

Table 3-7: Process Reference Installation

Type of pipe	Grounding straps	Reference electrode	Ground rings	Lining protectors
Conductive unlined pipe	Acceptable	Acceptable	Acceptable	Acceptable
Conductive lined pipe	Not acceptable	Acceptable	Acceptable	Acceptable
Non-conductive pipe	Not acceptable	Acceptable	Acceptable	Acceptable

Flange availability

Flange selection is dependent on line size, flange type, flange face and flange rating. Consult the Emerson Sizing and Selection tool for valid combinations.

Flange type slip-on raised or flat faced

Table 3-7: Process Reference Installation

	Flange code and rating								
	1	3	6	D	E	F	H	K	L
Size Code	ASME Class 150	ASME Class 300	ASME Class 600 Derated	EN PN10	EN PN16	EN PN25	EN PN40	AS2129 Table D	AS2129 Table E
005	★	★	★				★	★	★
010	★	★	★				★	★	★
015	★	★	★				★	★	★
020	★	★	★		★		★	★	★
025	★	★	★		★		★	★	★
030	★	★	★		★		★	★	★
040	★	★	★		★		★	★	★
050	★	★	★		★		★	★	★
060	★	★	★		★	★	★	★	★
080	★	★	★	★	★	★	★	★	★

Weld neck flanges

Table 3-9: Weld Neck Flange Options by Line Size

	Flange code and rating						
	1	3	6	D	E	F	H
Size Code	ASME Class 150	ASME Class 300	ASME Class 900	EN PN10	EN PN16	EN PN25	EN PN40
005	★	★					★
010	★	★	★				★
015	★	★	★				★
020	★	★	★		★		★
025							
030	★	★	★		★		★
040	★	★	★		★		★
050							
060	★	★	★		★	★	★
080	★	★	★	★	★	★	★

Coil housing

Materials of construction	General characteristics
Aluminum	Standard offering Type 6P IP 66/67/68/69 rating
300 Series SST	All welded, coil housing construction Type 6P IP 66/67/68/69 rating
316 SST	All welded, coil housing construction for robust protection in corrosive and nearshore or offshore marine environments Type 6P IP 66/67/68/69 rating

Mounting configuration

Materials of construction	General characteristics
Integral	Compact installation, transmitter mounted directly on the sensor
Remote with core processor assembly	Flexible installation, transmitter mounted remotely from the sensor, sensor replacement with core processor assembly
Remote without core processor assembly	Flexible installation, transmitter mounted remotely from the sensor, sensor replacement without core processor assembly

Junction box material

Materials of construction	General characteristics
Aluminum	Standard offering Type 6P IP 66/67/68/69 rating
316 SST	Robust protection in corrosive and nearshore or offshore marine environments Type 6P IP 66/67/68/69 rating

Conduit entry

- ½" NPT
- M20

Safety approvals

Safety approvals	General characteristics
Ordinary location	IEC 61010-1
US and Canada	Class I Div 1, Class I Div 2, Class II Div 1, Class I Zone 0, Class I Zone 21
IECEx and ATEX	Zone 0, 1, 2, Zone 20, 21, 22

Remote cables

10 foot standard cable provided for all sensors with remote configurations. If other cable lengths or armored cable is required, consult either the Table 3-10 table or the Table 3-11.

Table 3-10: Standard remote cable

Length	Part number
10ft (3m)	CMVDSZZ010
15ft (4.5m)	CMVDSZZ015
35ft (10m)	CMVDSZZ035
50ft (15m)	CMVDSZZ050
65ft (19.8m)	CMVDSZZ065
115ft (35m)	CMVDSZZ115
150ft (45m)	CMVDSZZ150
185ft (55m)	CMVDSZZ185
250ft (75m)	CMVDSZZ250
325ft (99m)	CMVDSZZ325
500ft (150m)	CMVDSZZ500
650ft (198m)	CMVDSZZ650
1000ft (300m)	CMVDSZZ01K

Table 3-11: Armored remote cable

Length	Part number
10ft (3m)	CMVDAZZ010
15ft (4.5m)	CMVDAZZ015
35ft (10m)	CMVDAZZ035
50ft (15m)	CMVDAZZ050
65ft (19.8m)	CMVDAZZ065
115ft (35m)	CMVDAZZ115
150ft (45m)	CMVDAZZ150
185ft (55m)	CMVDAZZ185
250ft (75m)	CMVDAZZ250
325ft (99m)	CMVDAZZ325
500ft (150m)	CMVDAZZ500
650ft (198m)	CMVDAZZ650
1000ft (300m)	CMVDAZZ01K

Ground ring or lining protectors

Refer to [Table 3-6](#).

Calibration options

Table 3-12: Non-standard calibration verification

Option code	General characteristics
PS	For applications that require Five Velocity Calibration points and certification
EC	For applications that require Expanded Calibration and Certificate (9 points total)
IC	For applications that require ISO 17025 Accredited Calibration and Certificate (9 points total)

Table 3-13: Calibration option

Option code	General characteristics
D1	For applications that require high accuracy (0.15% of rate) performance

Ordering flow meter equipment

For full model validation, use the online configurator.

Ordering procedure

To order, select the desired sensor by specifying model codes from the ordering tables.

Standard tagging

Customer tag

- A customer-specified sensor tag name can be laser printed on the main product label.
- 1 line, 25 characters maximum text height 5 pt (0.05 in, 1.3 mm)

Wire-on tag (available)

- 316 SST laser etched tag
- 5 lines, 17 characters per line, text height 9 pt. (0.125in., 3.2mm)

Ordering 9205 Sensor



- A. Base model
- B. Lining size
- C. Revision level
- D. Lining material
- E. Electrode material
- F. Electrode type
- G. Line size
- H. Flange material
- I. Flange rating
- J. Coil housing material
- K. Mounting configuration
- L. Junction box material
- M. Conduit entry
- N. Safety approvals
- O. Ordering option

Required selections

Features A through N are required selections.
Select one from each table.

Note:

The starred offerings (★) represent the most common options and should be selected for the fastest delivery. The non-starred offerings are subject to additional delivery lead time.

Model

Code	Description	Common Option
9205	Rosemount 9205 Magnetic Flow Sensor	★

Line size

Code	Description	Common Option
005	½ in. (15 mm)	★
010	1 in. (25 mm)	★
015	1½ in. (40 mm)	★
020	2 in. (50 mm)	★
030	3 in. (80 mm)	★
040	4 in. (100 mm)	★
060	6 in. (150 mm)	★
080	8 in. (200 mm)	★

Revision level

Code	Description	Common Option
A	Revision level A	★

Lining material

Code	Description	Common Option
T	PTFE	
N	Neoprene - hard rubber	
P	Polyurethane	
K	PFA+	
L	Linatex - natural rubber	
H	PEX	
D	Adiprene	

Electrode material

Code	Description	Common Option
S	316L stainless steel	★
H	Nickel alloy 276 (UNS N10276)	★
T	Tantalum	
P	80% platinum, 20% iridium	
N	Titanium	
W	Tungsten-carbide coated 316L SST	
Y	Tungsten-carbide coated nickel alloy 276	

Electrode type

Code	Description	Common Option
A	2 measurement electrodes - standard	★
B	2 measurement electrodes - bulletnose	
T	2 measurement electrodes - flat	
E	2 measurement electrodes plus 1 reference electrode - standard	
F	2 measurement electrodes plus 1 reference electrode - bulletnose	
U	2 measurement electrodes plus 1 reference electrode - flat	

Flange material

Code	Description	Common Option
C	Carbon steel	★
S	304/304L stainless steel	
P	316/316L stainless steel	

Flange type

Code	Description	Common Option
A	Slip-on raised face	★
B	Slip-on flat face	
C	Weld-neck raised face	
E	Weld-neck RTJ groove	

Flange rating

Code	Description	Common Option
1	ASME B16.5, Class 150	★
3	ASME B16.5, Class 300	★
6	ASME B16.5, Class 600 derated 1000psi @ 100F	
D	EN1092-1, PN10	
E	EN1092-1, PN16	
F	EN1092-1, PN25	
H	EN1092-1, PN40	
K	AS2129, Table D	
L	AS2129, Table E	

Coil housing material

Code	Description	Common Option
A0	Aluminum	★
S0	300 Series stainless steel	★
P0	316/316L stainless steel	★

Mounting configuration

Code	Description	Common Option
T	Integral field mount configuration (does not include transmitter)	★
R	Remote mount configuration with core processor assembly (does not include transmitter)	★
L	Remote mount configuration (does not include transmitter or core processor assembly)	★

Junction box material

Code	Description	Common Option
Z	None, integral field mount configuration	★
A	Aluminum junction box	★
P	Stainless steel junction box, cast CF-3M (316L equivalent)	

Conduit entry

Code	Description	Common Option
Z	None, integral field mount configuration	★
1	½-inch - 14 NPT	★
2	M20	★

Safety approvals

Code	Description	Common Option
NH	Ordinary location (non-hazardous)	★
ND	ATEX Dust (Ex tb)	★
NF	IECEx Dust (Ex tb)	★
N1	ATEX Intrinsically Safe (Ex ic); Dust (Ex tb)	★
N5	US Class I Div 2 Groups ABCD; DIP Class II/III Div 1 Groups EFG	★
N6	CAN Class I Div 2 Groups ABCD; DIP Class II/III Div 1 Groups EFG	★
N7	IECEx Intrinsically Safe (Ex ic); Dust (Ex tb)	★
NC	US/CAN Class I Zone 2 (Ex ic); Class I Zone 21 (Ex tb)	★
E1	ATEX Intrinsically Safe (Ex ia); Dust (Ex tb)	★
E5	US Class I Div 1 Groups ABCD; Class I Div 2 Gr ABCD; Class II/III Div 1 Groups EFG	★
E6	CAN Class I Div 1 Groups ABCD; Class I Div 2 Gr ABCD; Class II/III Div 1 Groups EFG	★
E7	IECEx Intrinsically Safe (Ex ia); Dust (Ex tb)	★
EC	US/CAN Class I Zone 0 (Ex ia); Dust Class I Zone 21 (Ex tb)	★

Ordering option

Code	Description	Common Option
Z	Standard product	★

Optional selections

Grounding rings or lining protectors

Code	Description	Common Option
G1	Ground ring - 316L stainless steel (quantity 2)	
G2	Ground ring - nickel alloy C-276; (quantity 2)	
G3	Ground ring - titanium (quantity 2)	
G4	Ground ring - tantalum (quantity 2)	
G5	Ground ring - 316L stainless steel (quantity 1)	
G6	Ground ring - nickel alloy C-276; (quantity 1)	
G7	Ground ring - titanium (quantity 1)	
G8	Ground ring - tantalum (quantity 1)	
L1	Lining protector - 316L stainless steel (quantity 2)	
L2	Lining protector - nickel alloy C-276; (quantity 2)	
L3	Lining protector - 316L stainless steel (quantity 1)	
L5	Lining protector - 316 stainless steel (quantity 1)	
L6	Lining protector - nickel alloy C-276; (quantity 1)	
L7	Lining protector - titanium (quantity 1)	

Non-standard calibration verification

Code	Description	Common Option
P5	Five Velocity Calibration Verification Report (1 point each at 2, 4, 6, 8, 10 ft/sec)	
EC	Expanded Calibration and Certificate (9 points total)	
IC	International Organization for Standardization (ISO) 17025 accredited Calibration and Certificate (9 points total)	

Calibration option

Code	Description	Common Option
D1	High accuracy calibration	

Pressure standard

Code	Description	Common Option
CR	Canadian Registration Number (CRN) Certification	
PD	European Pressure Equipment Directive Certification (PED)	
TS	China Manufacturing License Certification (TS)	

Lay length

Code	Description	Common Option
H4	Custom length matching ISO 20456	

Calibration certificate (Q4)

Code	Description	Common Option
Q4	Calibration Certificate per ISO 10474 3.1/EN 10204 3.1	

Quality Certificate (Q5)

Code	Description	Common Option
Q5	Hydrostatic Test Certificate	

Quality Certificate (Q8)

Code	Description	Common Option
Q8	Material Traceability per ISO 10474 3.1/EN 10204 3.1	

Quality Certificate (Q25)

Code	Description	Common Option
Q25	Certificate of Compliance to NACE MR0175 and MR0103	

Quality Certificate (Q66)

Code	Description	Common Option
Q66	Welding Certificates (PQR, WPQ, WPS)	

Quality Certificate (Q70-Q71)

Code	Description	Common Option
Q70	Inspection Certificate Weld Examination per ISO 10474 3.1	
Q71	Inspection Certificate Weld Examination per ISO 10474 3.1 (includes X-ray images)	

Quality Certificate (Q76-Q77)

Code	Description	Common Option
Q76	Positive material identification (PMI) on flange and pipe per ASTM E1476-97	

Witness general

Code	Description	Common Option
WG	Witness general	

QSG language options

Code	Description	Common Option
YF	French	★
YG	German	★
YI	Italian	★
YJ	Japanese	★
YK	Korean	★
YM	Chinese (Mandarin)	★
YP	Portuguese (Brazil)	★
YR	Russian	★
YS	Spanish	★

Technical specifications

The following information outlines some of the basic functional, performance, and physical specifications of the 9000 Series Magnetic Flow Sensor.

For transmitter features and ordering information consult the Rosemount 9000 Series: Magnetic Flow Transmitter PDS MS-00813-0100-9000.

Functional specifications

Service

Conductive liquids and slurries

Conductivity limits

Minimum conductivity of 2 μ S/cm (2 micromho/cm)

- Minimum conductivity of 1 μ S/cm (1 micromho/cm) with fluouopolymer (PTFE and PFA) liners

Line sizes

Line Size	Line Size Code
½ in. (15 mm)	005
1 in. (25 mm)	010
1½ in. (40 mm)	015
2 in. (50 mm)	020
3 in. (80 mm)	030
4 in. (100 mm)	040
6 in. (150 mm)	060
8 in. (200 mm)	080

Process temperature limits

Liner material	Liner Code	Process temperature range
PTFE	T	–58 to +350 °F (–50 to +177 °C)
PFA+	K	–58 to +350 °F (–50 to +177 °C)
Polyurethane	P	0 to +140 °F (–18 to +60 °C)
Neoprene	N	0 to +176 °F (–18 to +80 °C)
Linatex	L	0 to +158 °F (–18 to +70 °C)
Adiprene	D	0 to +200 °F (–18 to +93 °C)
PEX	H	0 to +203 °F (–18 to +95 °C)

Sensors ordered with hazardous area certifications may have different maximum process temperature limits. The sensors must be installed and used as directed by the installation drawing number noted on the serial nameplate. For detailed approval certification information and installation drawings, see the appropriate document:

- Approvals Document: *IECEX and ATEX - Magnetic Flow Meter - Model 9732 and 9205* | Rosemount, Document Number 00825-MA00-0015
- Approvals Document: *Class Division - Magnetic Flow Meter - Model 9732 and 9205* | Rosemount, Document Number 00825-MA00-0016
- Approvals Document: *North American Zone - Magnetic Flow Meter - Model 9732 and 9205* | Rosemount, Document Number 00825-MA00-0017

Flange materials

Code	Description	Temperature range
C	Carbon steel	-20 to +356 °F (-29 to 180 °C)
S	304/304L	-58 to 356 °F (-50 to +180 °C)
P	316/316L	-58 to 356 °F (-50 to +180 °C)

Pressure limits

Rosemount magnetic flow meters are designed to the standards defined in ASME B31.3. This standard is used as the basis for all other pressure vessel certifications, such as CRN and PED.

European Pressure Directive (PED) Carbon steel flanges have a minimum process temperature limit of +32 °F (0 °C).

Canadian Registration CRN#0F24561

Table 1: Temperature vs. Pressure Limits for ASME B16.5 class flanges¹

Up to 36-in. line sizes

Flange material	Flange rating	Pressure			
		@ -20 to +100 °F (-29 to +38 °C)	@ +200 °F (+93 °C)	@ +300 °F (+149 °C)	@ +350 °F (+177 °C)
Carbon Steel	Class 150	285 psi	260 psi	230 psi	215 psi
	Class 300	740 psi	680 psi	655 psi	645 psi
	Class 600 ²	1000 psi	800 psi	700 psi	650 psi
	Class 600 ³	1480 psi	1350 psi	1315 psi	1292 psi
	Class 900	2220 psi	2025 psi	1970 psi	1935 psi
	Class 1200	3705 psi	3375 psi	3280 psi	3225 psi
	Class 2500	6170 psi	5625 psi	5470 psi	5375 psi
304/304L Stainless Steel 316/316L Stainless Steel	Class 150	275 psi	235 psi	205 psi	190 psi
	Class 300	720 psi	620 psi	530 psi	500 psi
	Class 600 ²	1000 psi	800 psi	700 psi	650 psi
	Class 600 ³	1440 psi	1200 psi	1055 psi	997 psi
	Class 900	2160 psi	1800 psi	1585psi	1497 psi
	Class 1200	3600 psi	3000 psi	2640 psi	2495 psi
	Class 2500	6000 psi	5000 psi	4440 psi	4160 psi

- (1) Liner temperature limits must also be considered.
- (2) Flange rating Code 6.
- (3) Flange rating Code 7.

Table 2: Temperature vs. Pressure Limits for EN 1092-1 flanges¹

Flange material	Flange rating	Pressure			
		@ -29 to 50 °C (-20 to 122 °F)	@ 100 °C (212 °F)	@ 150 °C (302 °F)	@ 175 °C (347 °F)
Carbon Steel	PN 10	10 bar	10 bar	9.7 bar	9.5 bar
	PN 16	16 bar	16 bar	15.6 bar	15.3 bar
	PN 25	25 bar	25 bar	24.4 bar	24.0 bar
	PN 40	40 bar	40 bar	39.1 bar	38.5 bar
304/304L Stainless Steel 316/316L Stainless Steel	PN 10	9.1 bar	7.5 bar	6.8 bar	6.5 bar
	PN 16	14.7 bar	12.1 bar	11.0 bar	10.6 bar
	PN 25	23 bar	18.9 bar	17.2 bar	16.6 bar
	PN 40	36.8 bar	30.3 bar	27.5 bar	26.5 bar

(1) Liner temperature limits must also be considered.

Table 3: Temperature vs. Pressure Limits for AS2129 Table D and E Flanges¹

4 to 24 in. line sizes

Flange material	Flange rating	Pressure			
		@ -29 to 50 °C (-20 to 122 °F)	@ 100 °C (212 °F)	@ 150 °C (302 °F)	@ +200 °C (+392 °F)
Carbon Steel	D	101.6 psi (7 bar)	101.6 psi (7 bar)	101.6 psi (7 bar)	94.3 psi (6.5 bar)
	E	203.1 psi (14 bar)	203.1 psi (14 bar)	203.1 psi (14 bar)	188.6 psi (13 bar)

(1) Liner temperature limits must also be considered.

Vacuum limits

Table 4: Allowable Vacuum /Temperature Limits of Teflon (PTFE) in Inches of Mercury

Pipe size	20 to 100 degF	200 degF	250 degF	300 degF
.5 in.	FULL	FULL	FULL	FULL
1 in.	FULL	FULL	FULL	FULL
1.5 in.	FULL	FULL	FULL	FULL
2 in.	FULL	FULL	FULL	FULL
3 in.	FULL	FULL	FULL	FULL
4 in.	FULL	FULL	FULL	FULL
6 in.	FULL	FULL	FULL	24
8 in.	FULL	FULL	24	22

Submergence rating

The 9000 Series Magnetic Sensor is rated IP68 for continuous submergence. Tested to a depth of 33 ft. (10 m) for a period of 48 hours. Installer must use IP68 approved cable glands, conduit connections, and/or conduit plugs. For continuous submergence Emerson recommends using the welded coil housing designs option codes S0 or P0 with a remote mounted transmitter.

Performance specifications

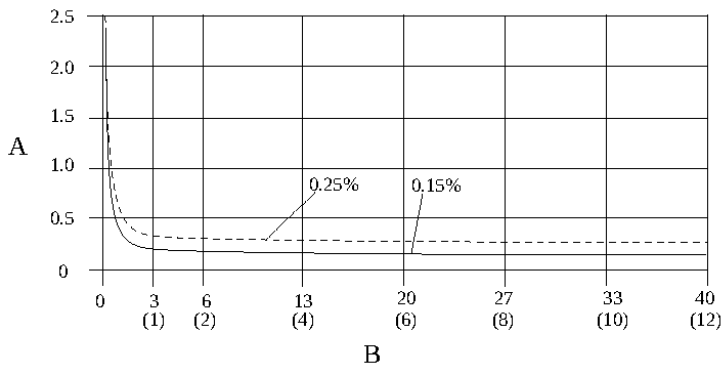
System specifications are given using the frequency output and with the unit at reference conditions.

Accuracy

Includes the combined effects of linearity, hysteresis, and repeatability.

Rosemount 9205 Sensor

- Standard system accuracy:
 - $\pm 0.25\%$ of rate ± 1.0 mm/s for full range, 0.01-39.37 ft/sec (0.003-12 m/s)
- Optional high accuracy:⁽¹⁾
 - $\pm 0.15\%$ of rate ± 1.0 mm/s for full range, 0.01-13 ft/sec (0.003-4 m/s)
- Short Run Install installation effect⁽²⁾
 - Up to $\pm 0.50\%$ of rate



- A. Percentage of rate
- B. Velocity in ft/sec (m/sec)

Physical specifications

Rosemount magnetic flow meters are designed to the standards defined in ASME B31.3. This standard is used as the basis for all of our other pressure vessel certifications, such as CRN and PED.

Wetted and non-wetted components

Process wetted components	Non-wetted components
Flanges - RTJ only	Flanges - raised-face and flat-faced
Liner	Sensor pipe
Electrodes	Coil housing
Ground ring/Lining protector	Lifting lugs
	Tube adaptor
	Remote junction box

(1) Requires High Accuracy option code D1
(2) Require Short Run Install option code SR1

Materials by code

Table 6: Materials of Construction

Flange code	Flanges (1)	Pipe (2)	Lift lugs (3)
C	Carbon steel ASTM A105	304 SST	Carbon steel
S	304 SST	304 SST	304 SST
P	316 SST	316 SST	316 SST
Code	Coil housing (4)	Tube adapter (5)	Screws (4a, 5a)
A0	Aluminum with Silicon Gasket	304 SST	300 SST
S0	300 Series SST - welded	316 SST - welded	n/a
P0	316 SST - welded	316 SST - welded	n/a
Code	Remote junction box, cover and clamp (6)	Cover o-rings (6a)	Ground lugs (6b)
A	Aluminum	Buna-N	SST
P	CF-3M; 316 SST equivalent	EPDM	SST

Liner code	Liner materials
T	PTFE
K	PFA+
P	Polyurethane
N	Neoprene
L	Linatex
D	Adiprene
H	PEX

Electrode code	Electrode material
S	316L stainless steel
H	Nickel Alloy C-276
T	Tantalum
P	80% Platinum-20% Iridium
N	Titanium
W	Tungsten-Carbide Coated 316L SST
Y	Tungsten-Carbide Coated Nickel Alloy C-276

Electrode code	Electrode type
A, E	Button - Standard
B, F	Bullet nose
T, U	Flat head

(6) Requires Calibration Option code D1 on Rosemount 9205 Mag Flow Sensor.

Process connections

ASME B16.5	- Class 150: ½ inch to 8 inch (15 mm to 200 mm) - Class 300: ½ inch to 8 inch (15 mm to 200 mm) - Class 600 derated: ½ inch to 8 inch (15 mm to 200 mm)⁽¹⁾
EN 1092-1	- PN10: 8 in. (200) - PN16: 50 mm to 200 mm (2 inch to 8 inch) - PN25: 150 mm to 200 mm (6 inch to 8 inch) - PN40: 15 mm to 900 mm (½ inch to 36 inch)
AS2129	- Table D: ½ inch to 8 inch (15 mm to 200 mm) - Table E: ½ inch to 8 inch (15 mm to 200 mm)
Flat-faced flanges	Sensors ordered with flat-faced flanges and neoprene or Linatex liners are manufactured with the liner extending to the outer dimension of the flange. All other liner selections extend to the diameter of raised face dimension and create a raised surface on the flange face.

(1) For PTFE, PFA, PFA+, and ETFE, maximum working pressure is derated to 1000 psig.

Electrical connections

Conduit entries	Available with ½-inch NPT and M20
Terminal block screws	6-32 (No. 6) suitable for up to 14 American Wire Gauge (AWG) wire
Safety grounding screws	External stainless assembly, M5; internal 8-32 (No. 8)

Installation Temperature Limits

The following tables provides graphs that define the allowable installation temperature ranges based on line size, sensor material, transmitter/junction box material, mounting configuration, and installation orientation.

Installation temperature limits

The following tables provide graphs that define the allowable installation temperature ranges based on line size, sensor material, transmitter/junction box material, mounting configuration, and installation orientation.

Key for Installation Temperature Limits graphs

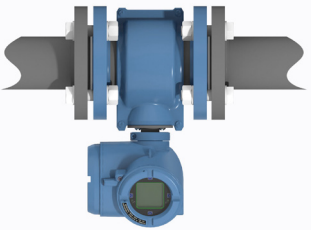
Installation orientation	Image	Installation temperature limits graph key
Heads up position:		View of sensor mounted right side up, showing the light blue area in each graph.
Heads down position		View of sensor mounted at upside down, showing the light and darker blue area in each graph.

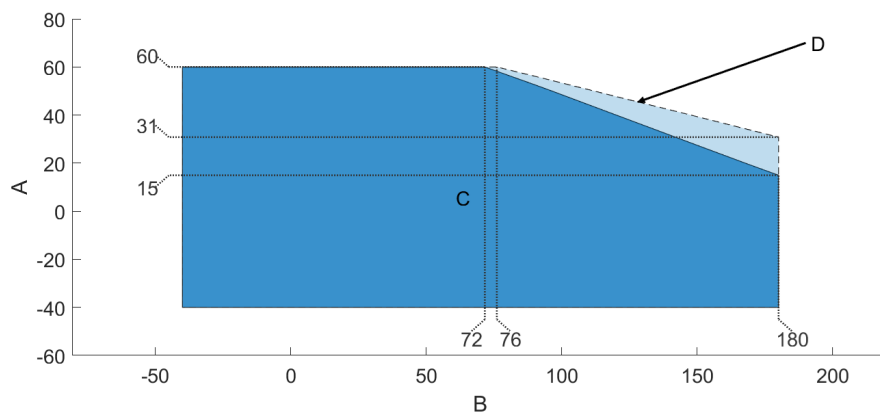
Table 5: Callouts for all sensor and electronics housing tables

Callout	Description
A	Ambient Temperature (°C)
B	Process Temperature (°C)
C	Head Up
D	Head Down

Installation temperature limits graphs

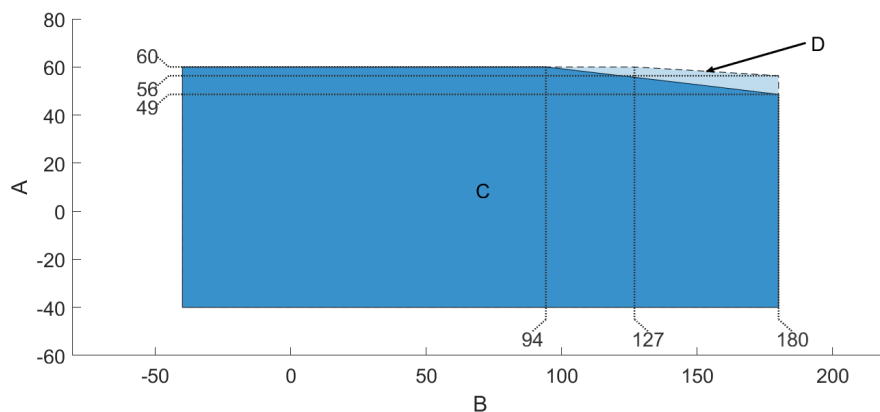
½-inch (15 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



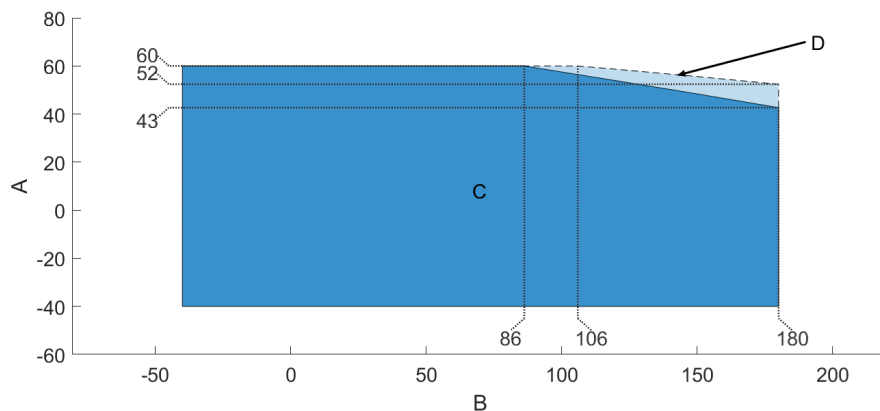
½-inch (15 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



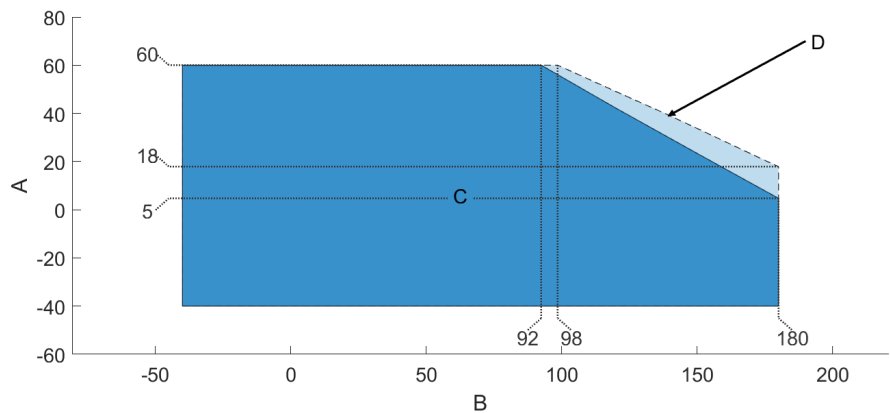
½-inch (15 mm) stainless steel sensor and stainless steel sensor transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



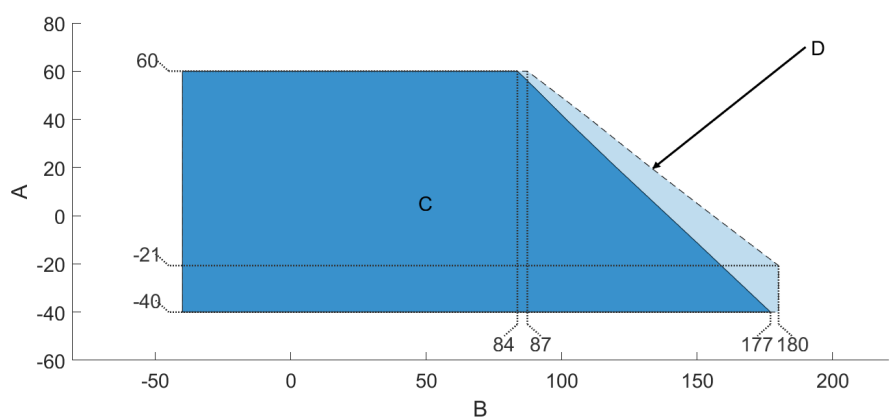
½-inch (15 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



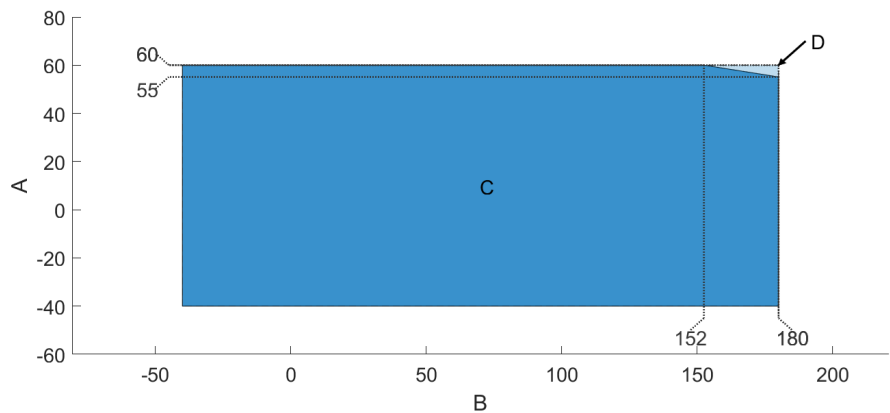
½-inch (15 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



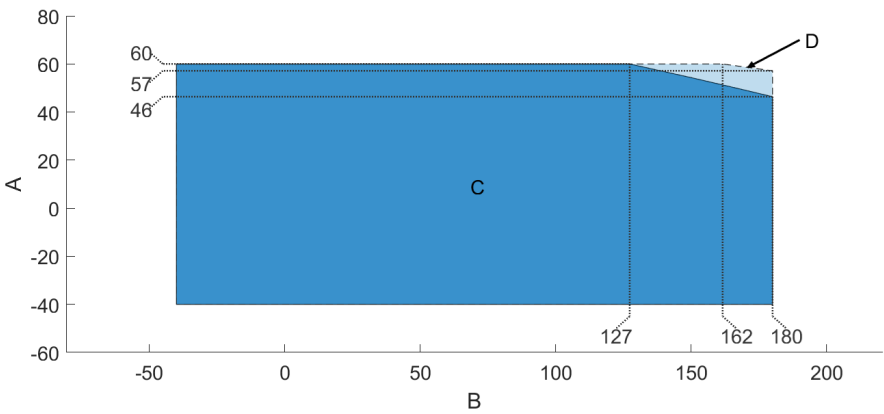
½-inch (15 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



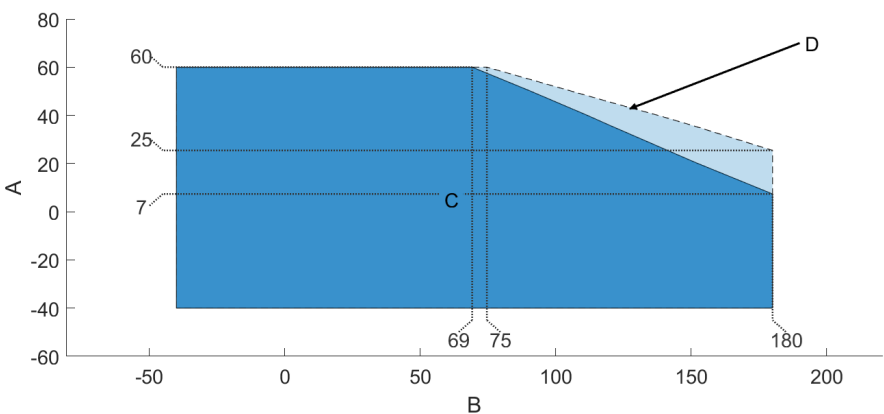
½-inch (15 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



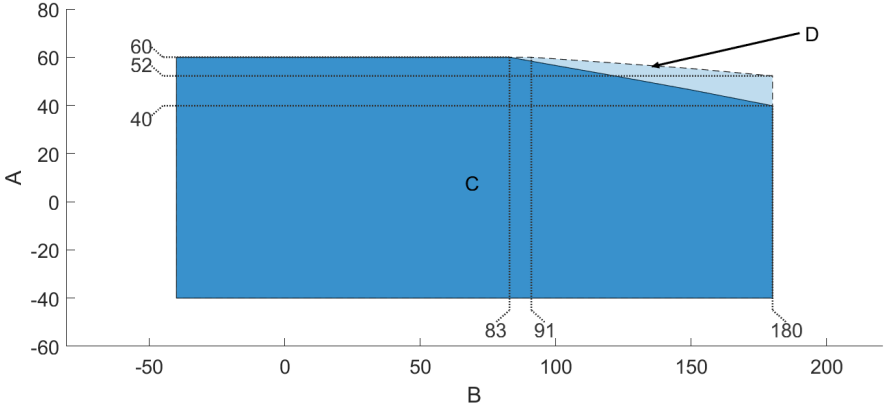
1-inch (25 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



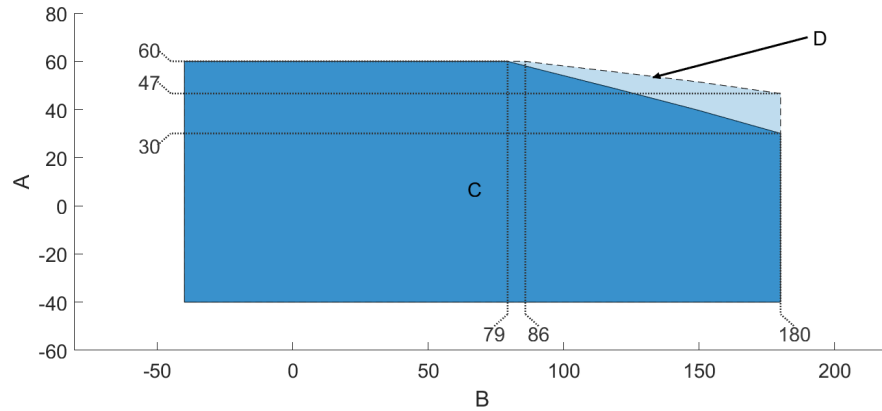
1-inch (25 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



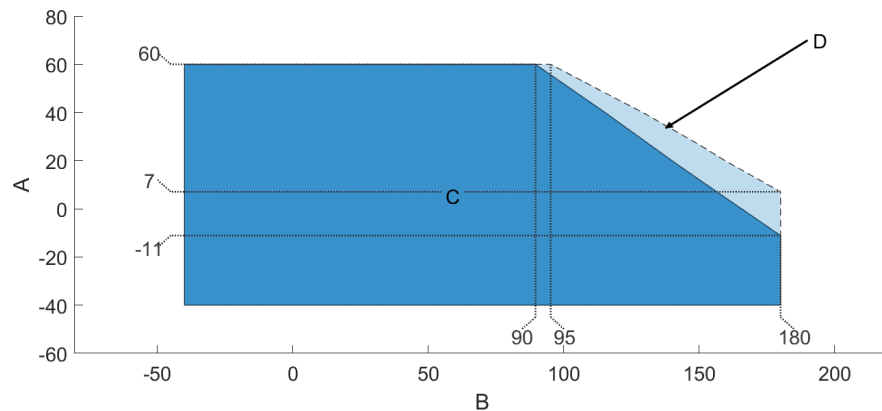
1-inch (25 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



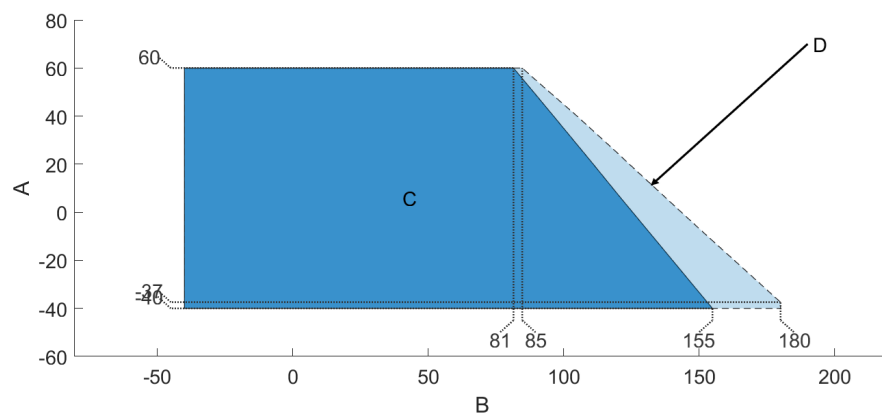
1-inch (25 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



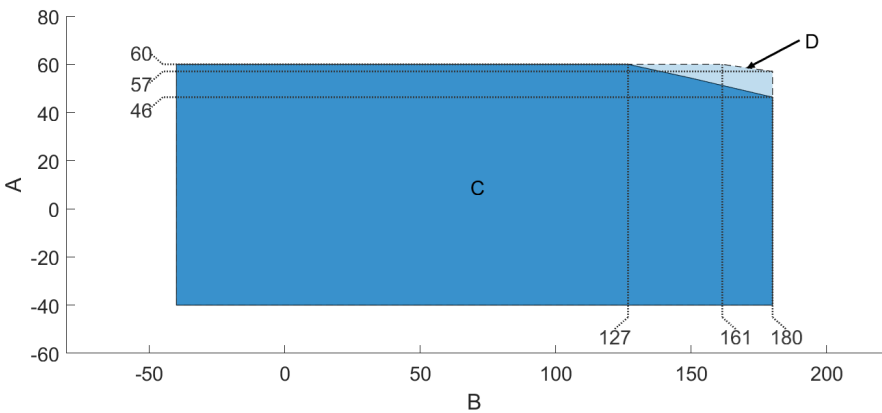
1-inch (25 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



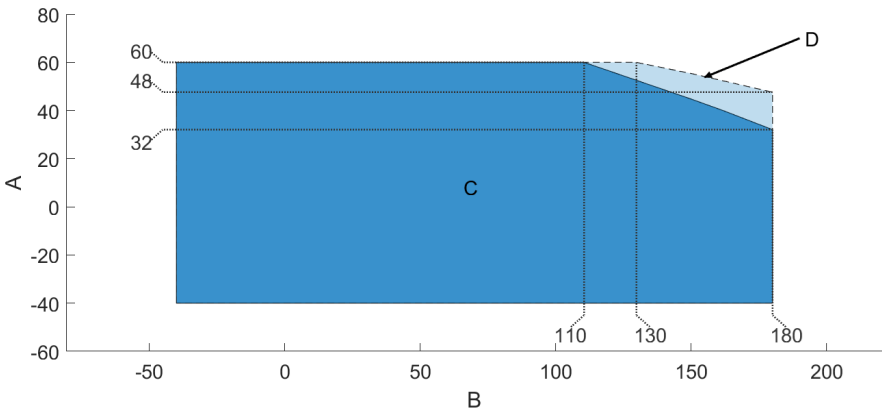
1-inch (25 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



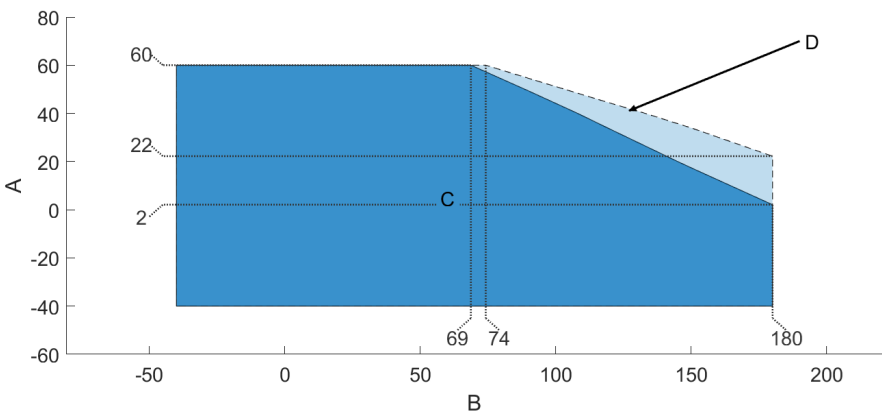
1-inch (25 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation temperature limits](#).



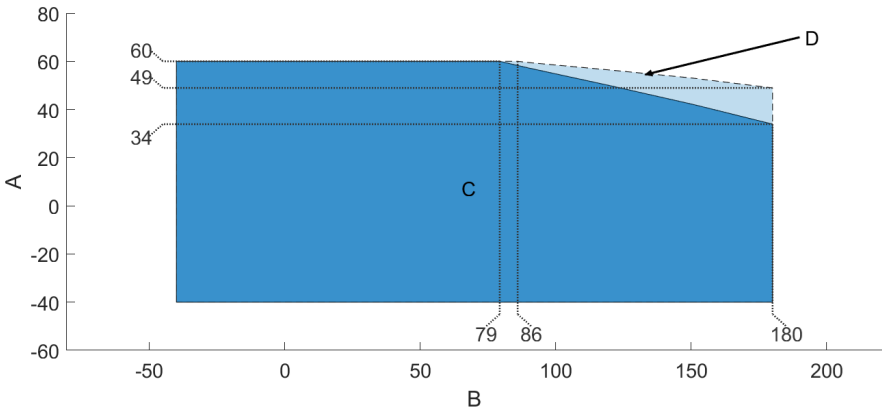
1.5-inch (40 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation temperature limits](#).



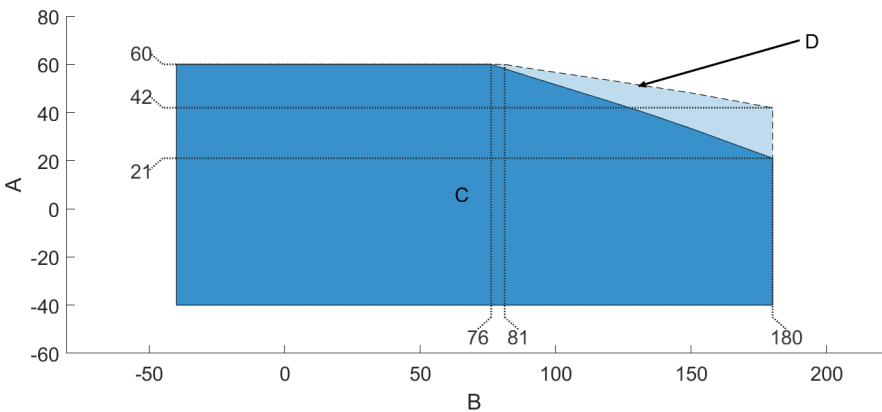
1.5-inch (40 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



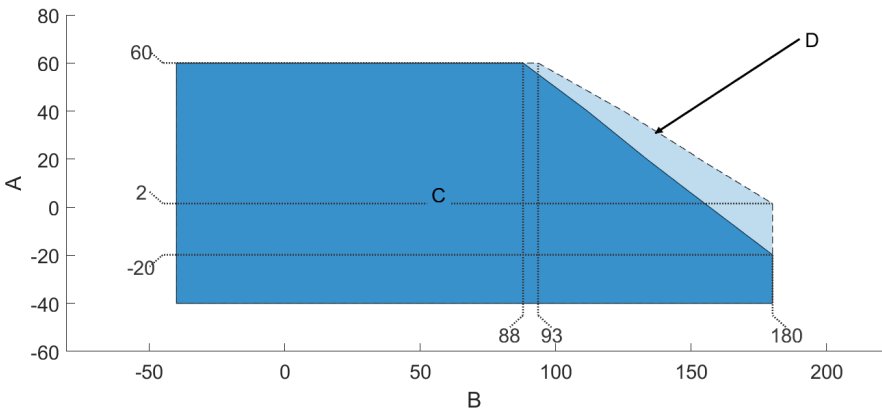
1.5-inch (40 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



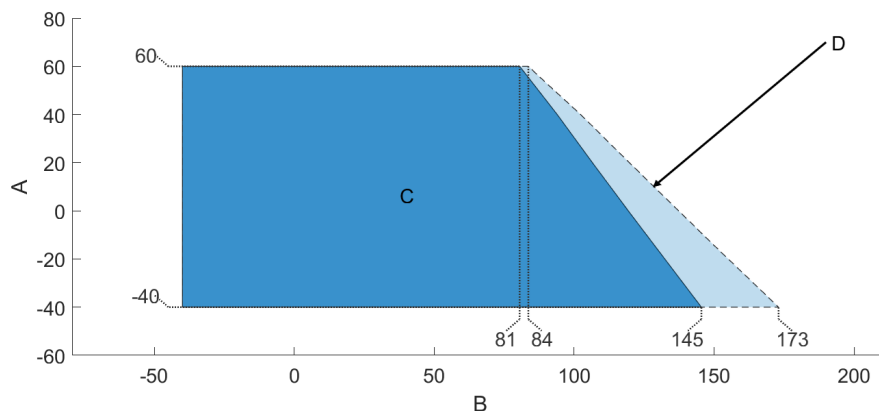
1.5-inch (40 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



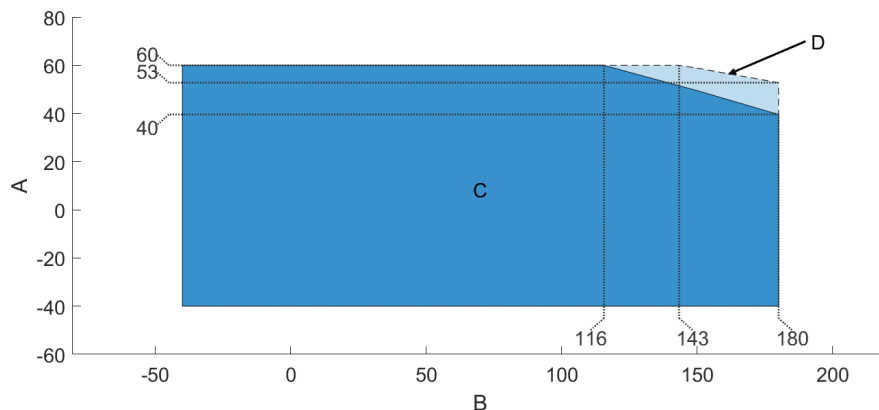
1.5-inch (40 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



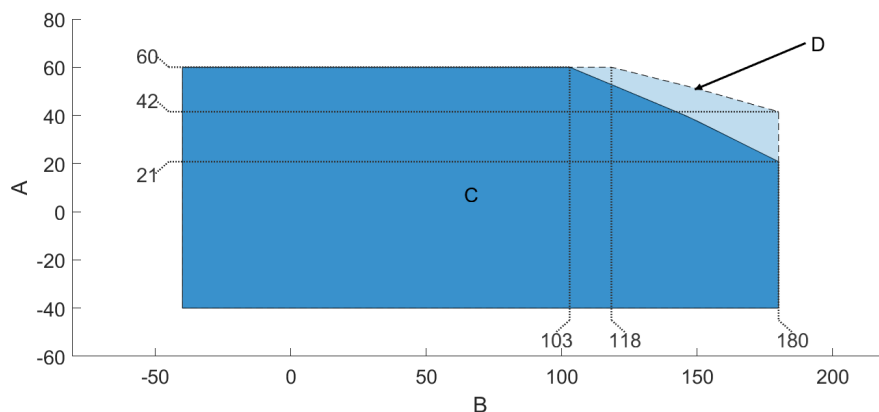
1.5-inch (40 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



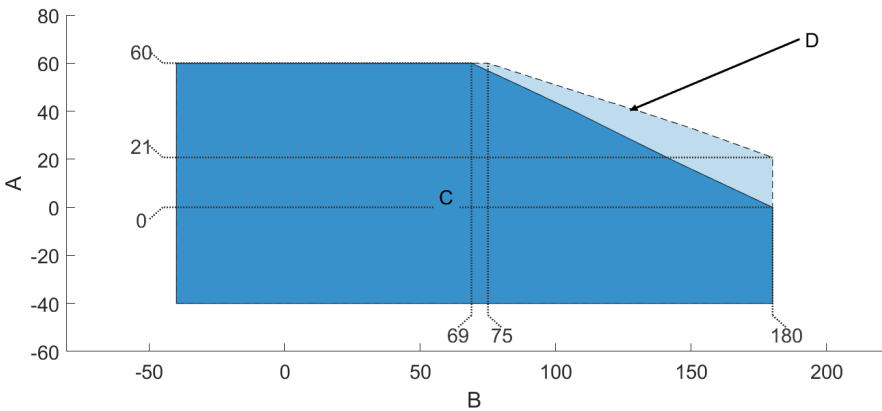
1.5-inch (40 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



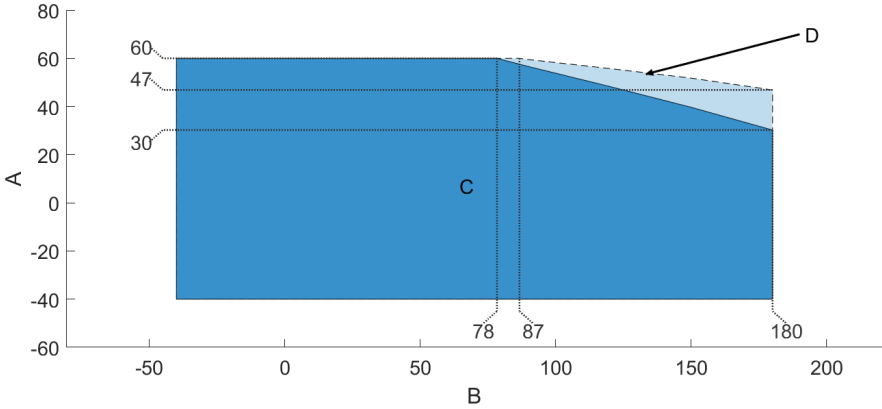
2-inch (50 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



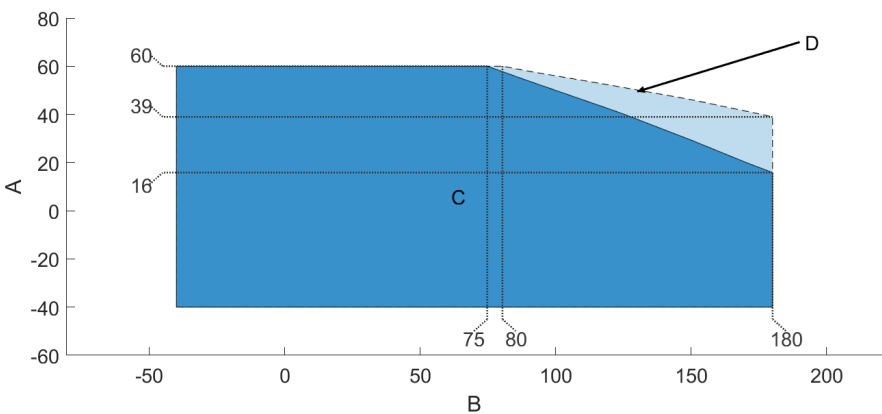
2-inch (50 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



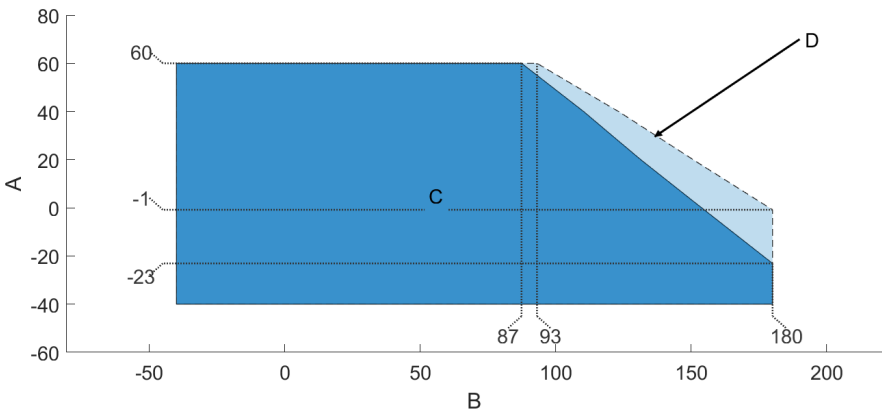
2-inch (50 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



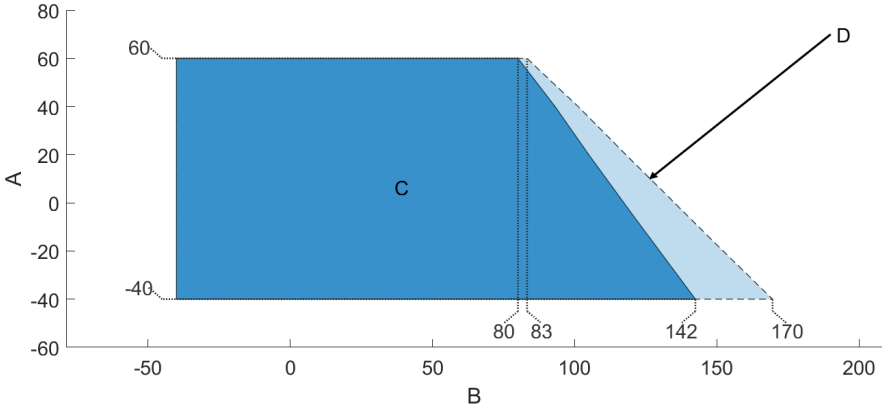
2-inch (50 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



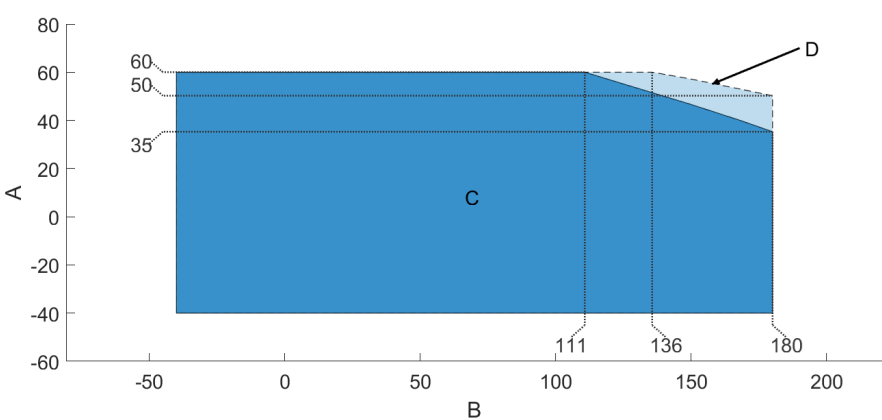
2-inch (50 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



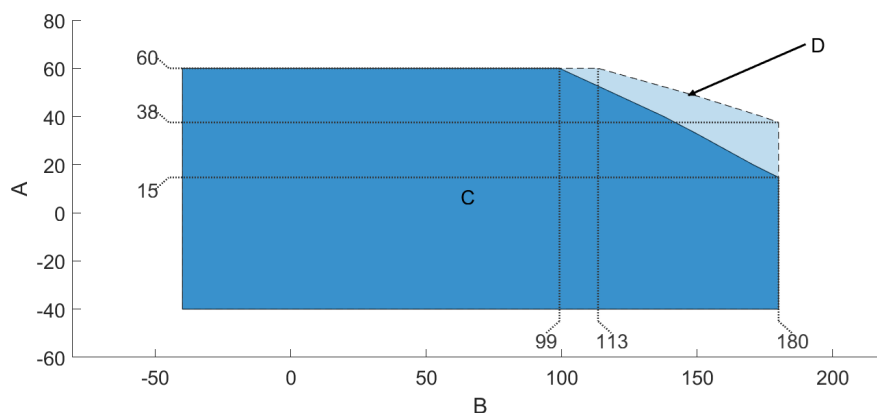
2-inch (50 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



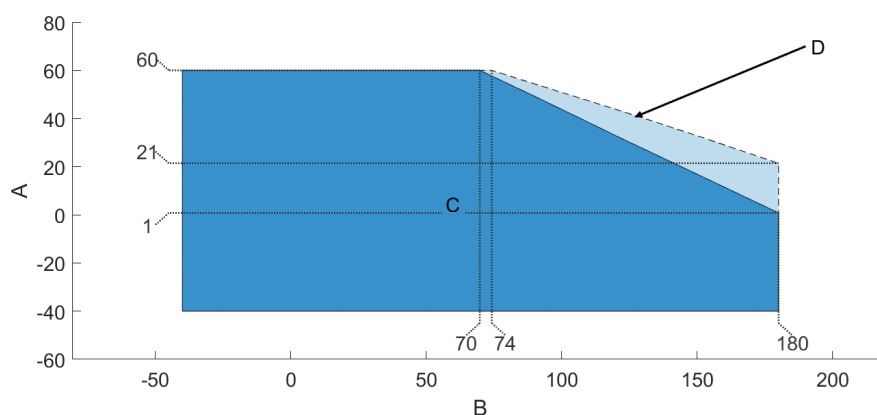
2-inch (50 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



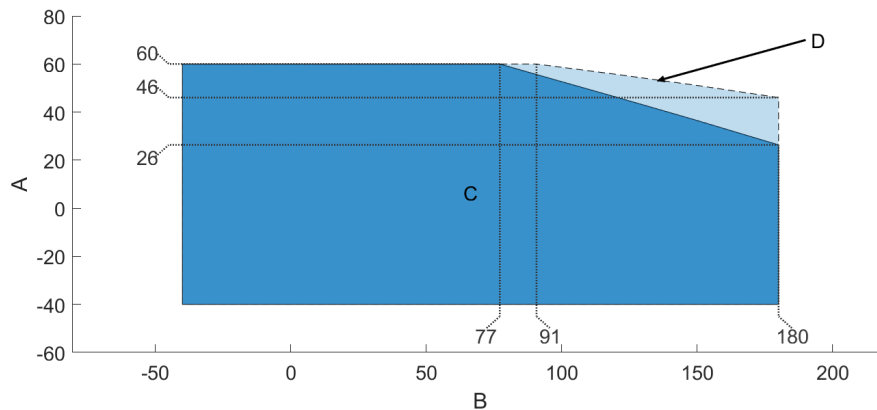
3-inch (80 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



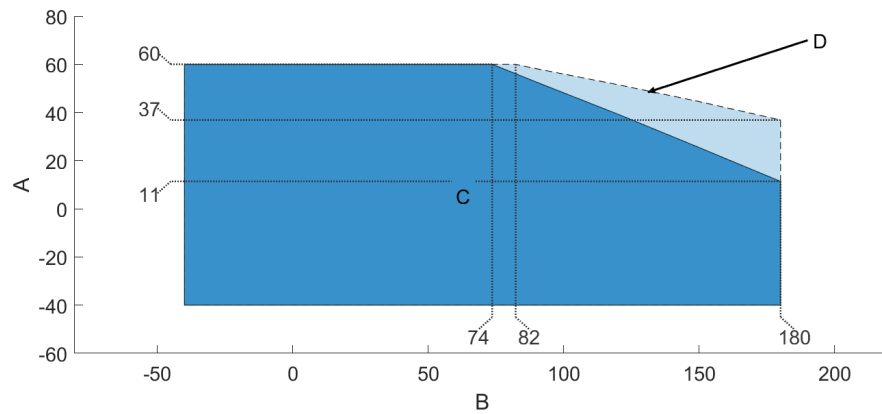
3-inch (80 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



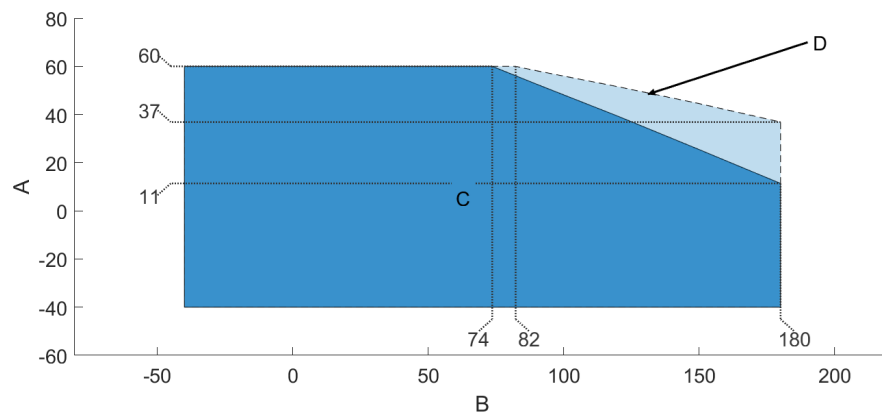
3-inch (80 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



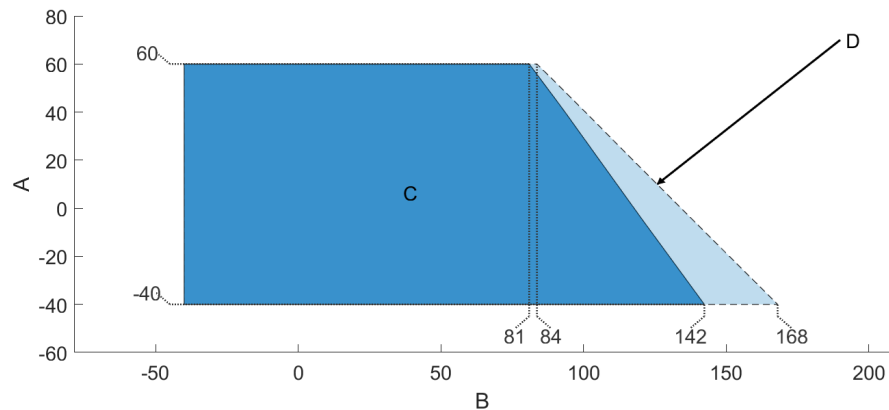
3-inch (80 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



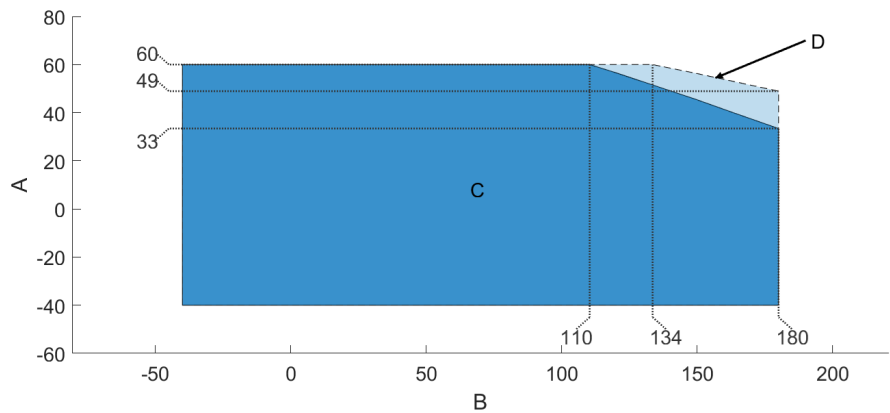
3-inch (80 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



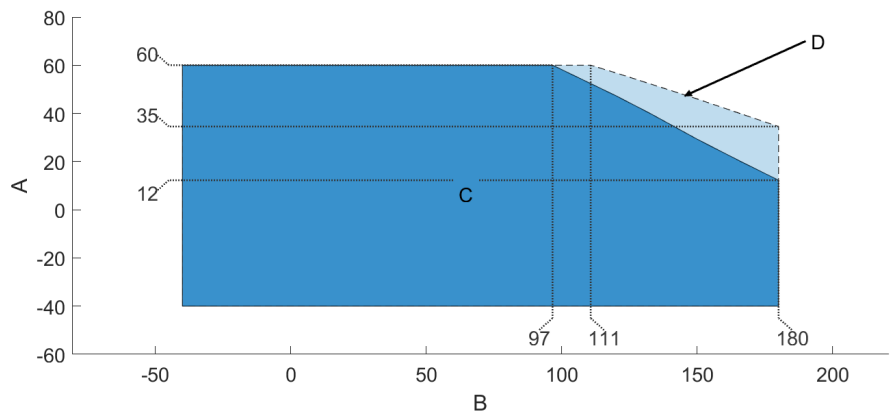
3-inch (80 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



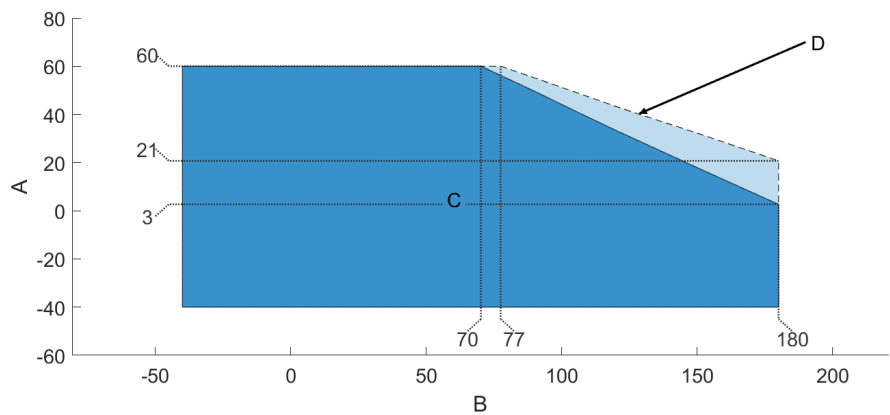
3-inch (80 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



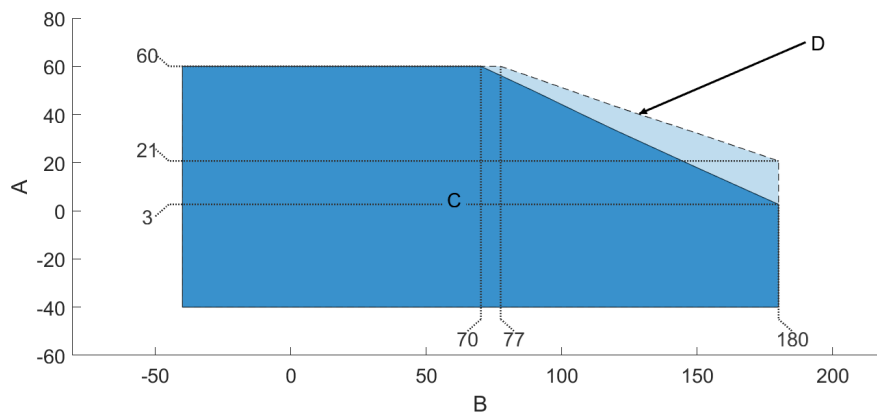
4-inch (100 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



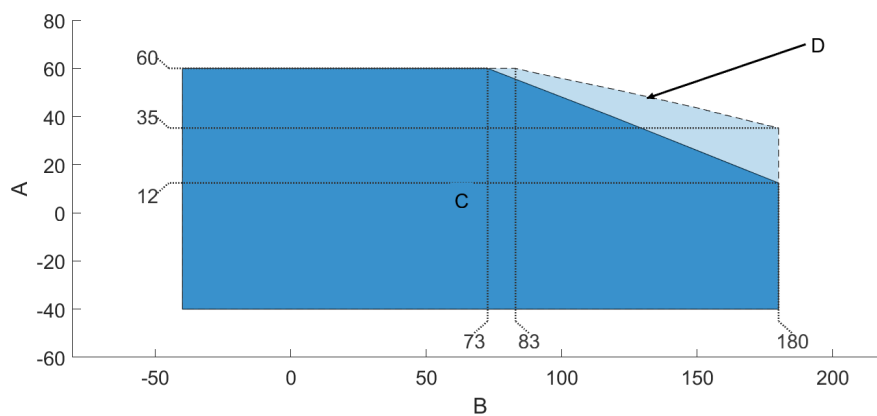
4-inch (100 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



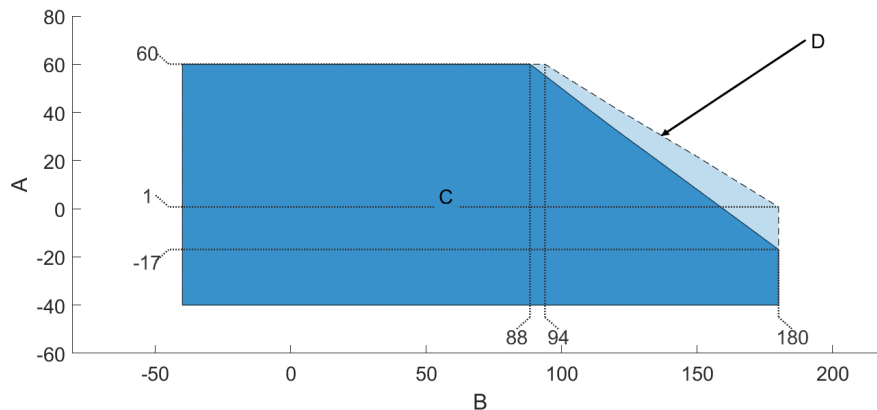
4-inch (100 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



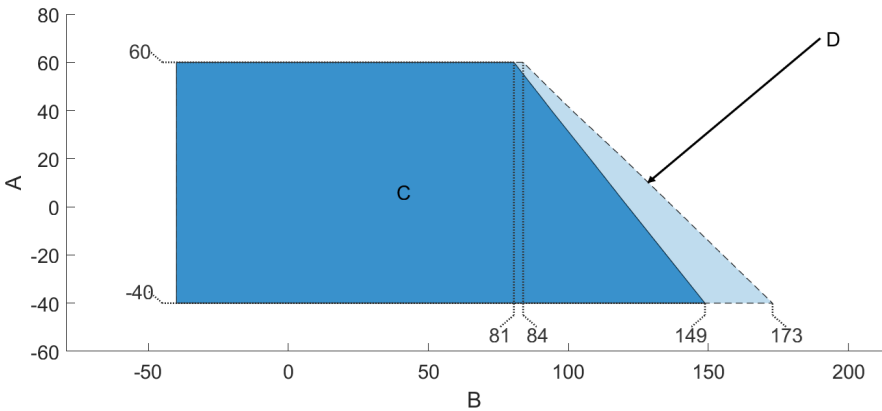
4-inch (100 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



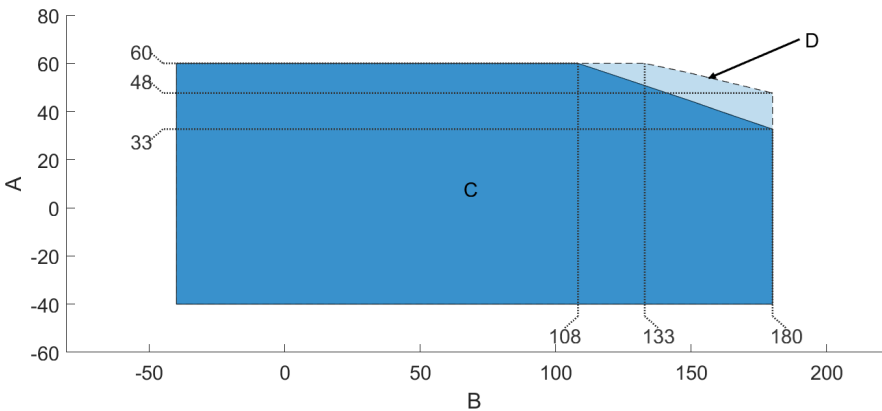
4-inch (100 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



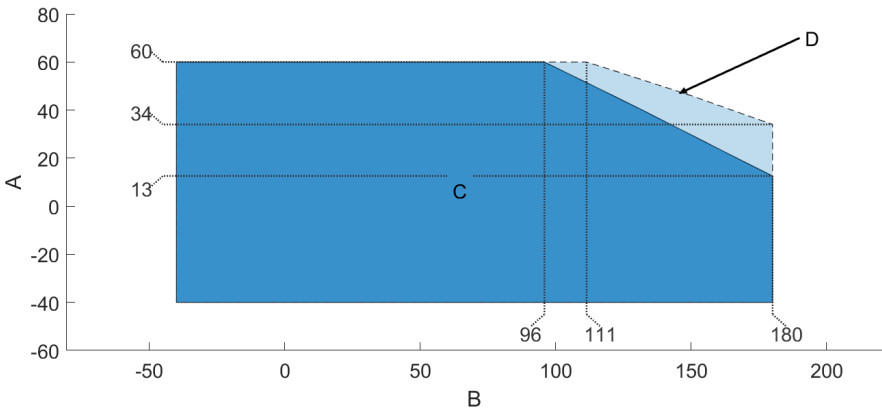
4-inch (100 mm) stainless steel and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



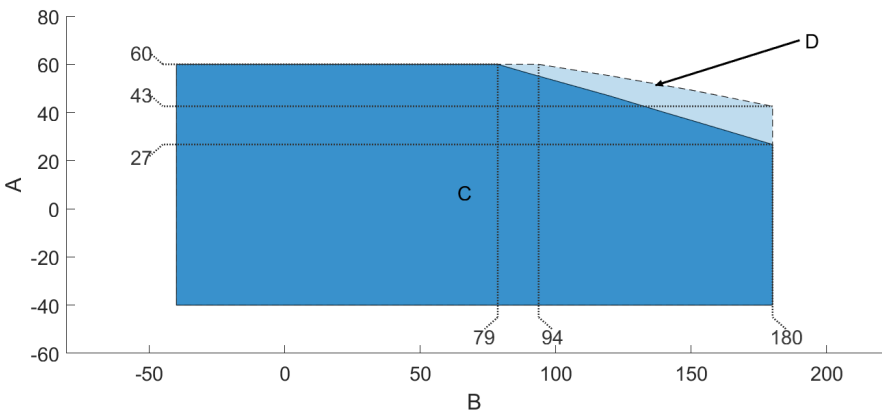
4-inch (100 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



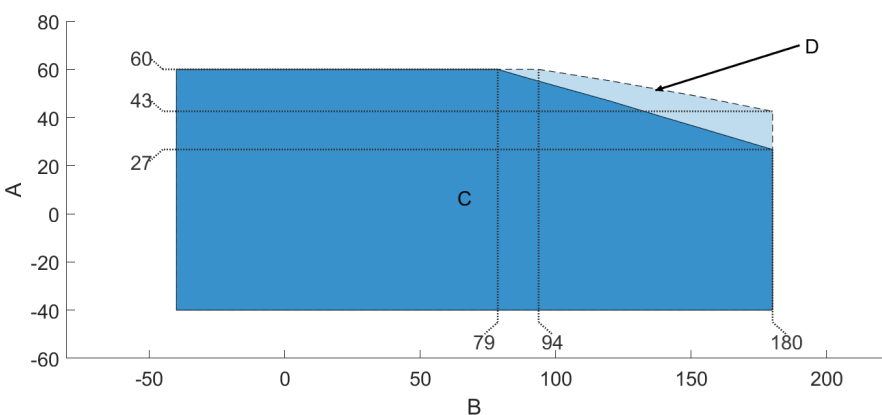
6-inch (150 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



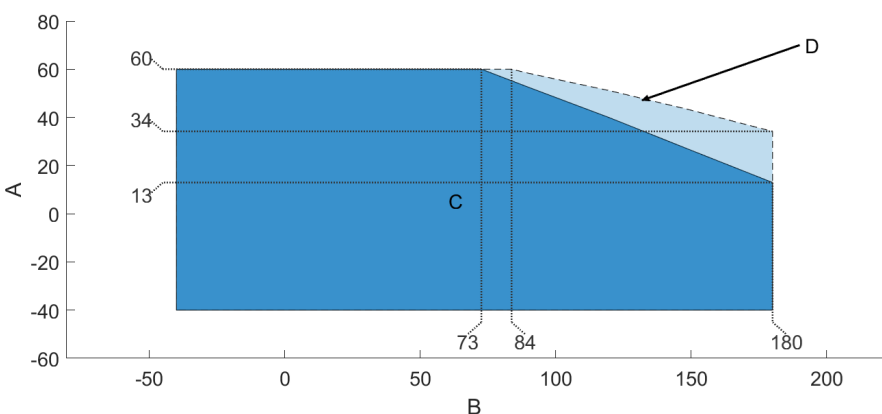
6-inch (150 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



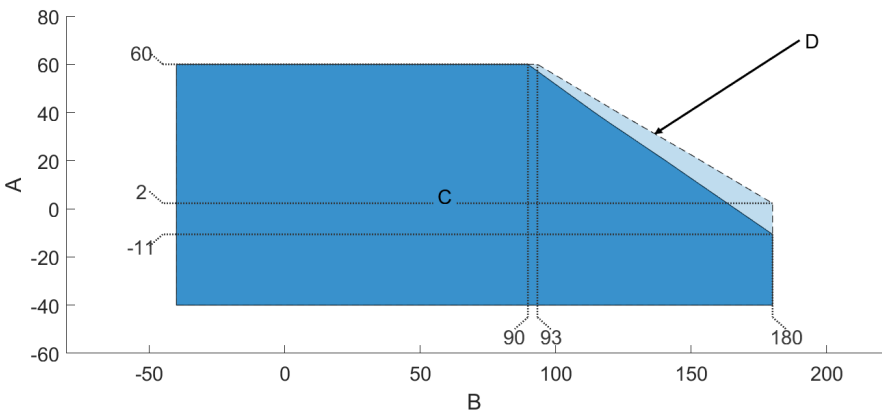
6-inch (150 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



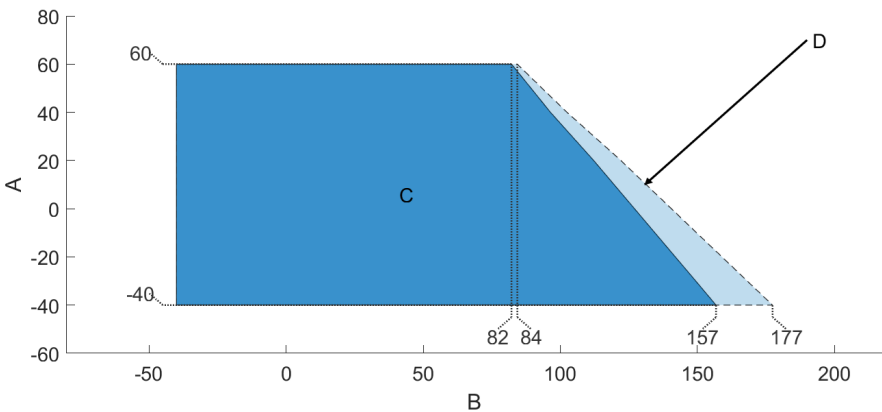
6-inch (150 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



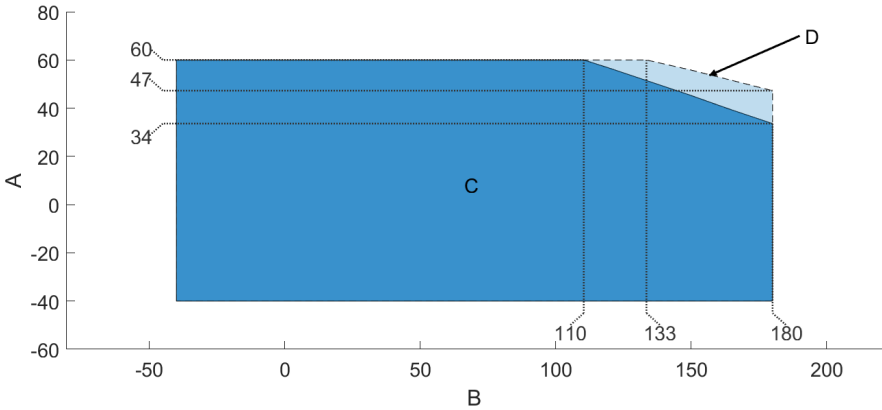
6-inch (150 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



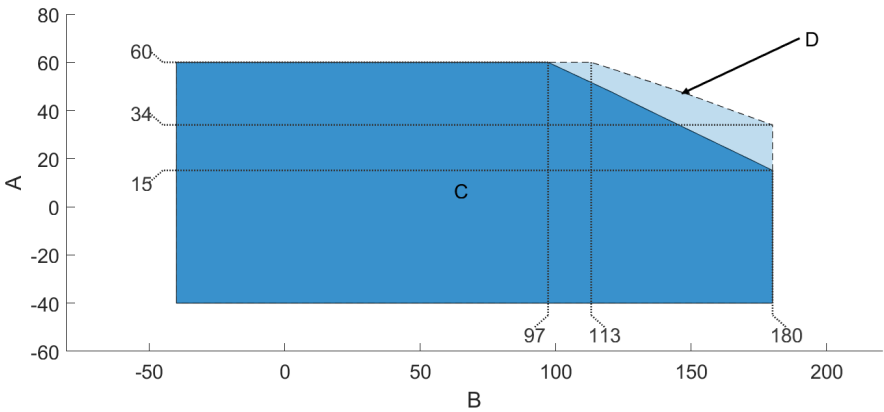
6-inch (150 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



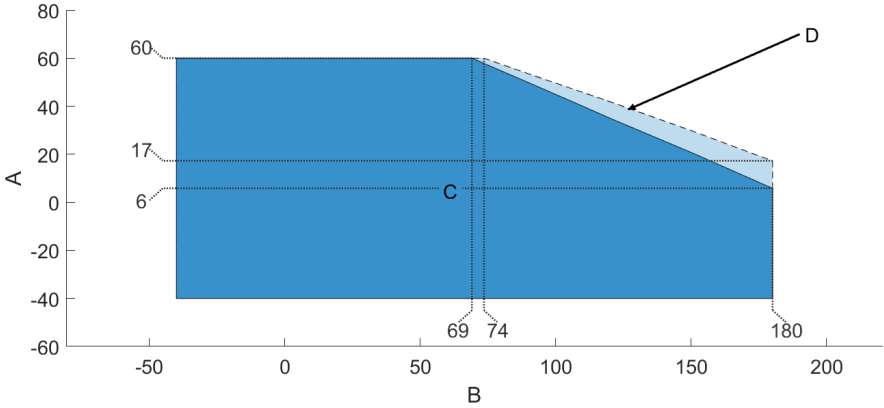
6-inch (150 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



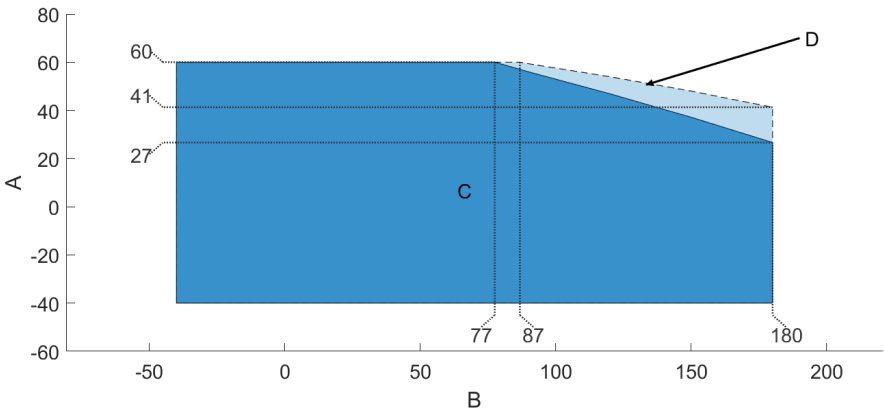
8-inch (200 mm) aluminum sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



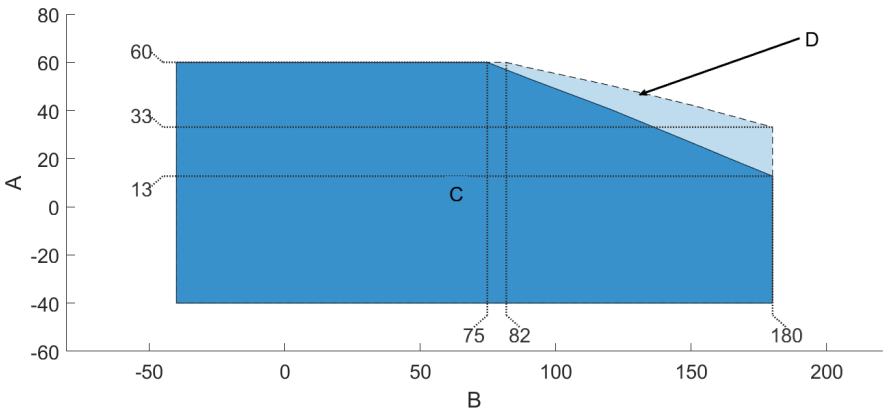
8-inch (200 mm) stainless steel sensor and aluminum transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



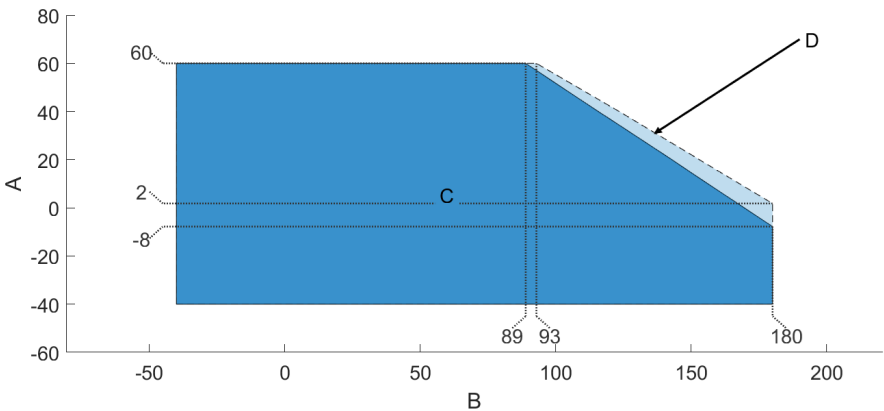
8-inch (200 mm) stainless steel sensor and stainless steel transmitter, integral mount

For values in the graph, refer to [Installation Temperature Limits](#).



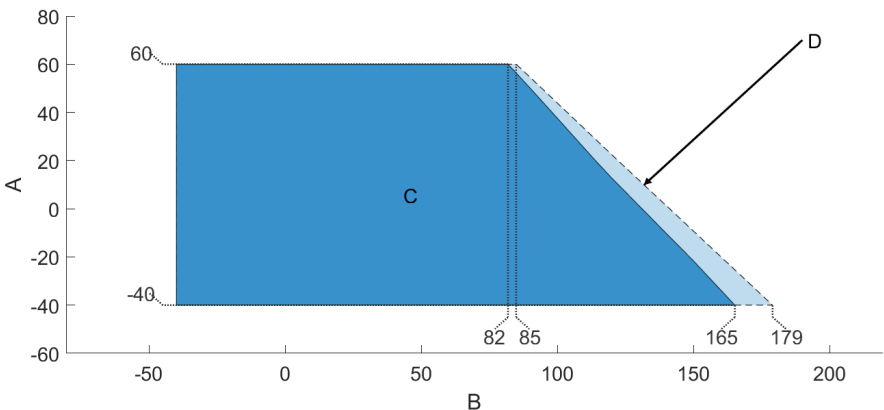
8-inch (200 mm) aluminum sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



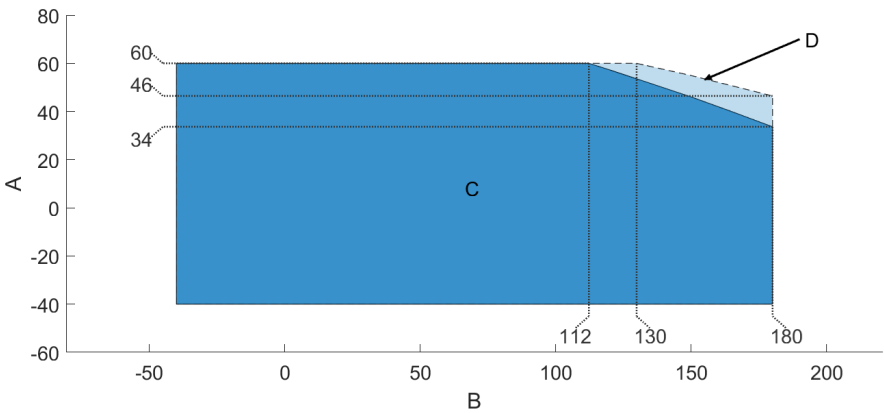
8-inch (200 mm) aluminum sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



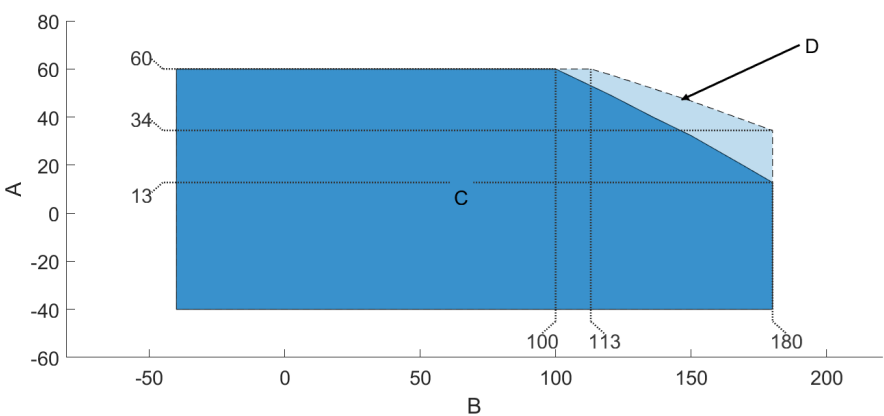
8-inch (200 mm) stainless steel sensor and aluminum junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



8-inch (200 mm) stainless steel sensor and stainless steel junction box, remote mount

For values in the graph, refer to [Installation Temperature Limits](#).



Product certifications

For detailed approval certification information and installation drawings, see the appropriate document:

- Approvals Document: *IECEX and ATEX - Magnetic Flow Meter - Model 9732 and 9205* | Rosemount, Document Number 00825-MA00-0015
- Approvals Document: *Class Division - Magnetic Flow Meter - Model 9732 and 9205* | Rosemount, Document Number 00825-MA00-0016
- Approvals Document: *North American Zone - Magnetic Flow Meter - Model 9732 and 9205* | Rosemount, Document Number 00825-MA00-0017

Dimensional drawings

For dimensional drawings, please refer to 09205-0024. This document can be found in the Drawings section of the Rosemount 9205 Magnetic Flow Sensor Product Page.

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