S1 Pressure Transducer

Features

- Compact and highly configurable; wide selection of pressure connections, electrical terminations and outputs
- Designed for mid-high volume OEM applications
- Stainless steel sensing element
- Field proven polysilicon thin film pressure sensor
- Pressure ranges from VAC to 10,000 psi

Typical Uses

- Off road vehicles
- Construction machinery
- Hydraulic and pneumatic sensing
- Performance racing
- Transportation
- Agriculture implements
- Compressor control
- HVAC/R
- Process automation and control
- Pump monitoring

S1 High
Pressure Transducers

S1 Low
Pressure Transducer

Key Benefits

- Compact & rugged design
- Variety of housing and connection material options
- High EMI/RFI immunity ratings

Specifications

Reference Temperature:	72 °F ±2 °F (22 °C ±1 °C)
Accuracy Class:	±1.0% Span (±0.50% Optional): Includes non-linearity, hysteresis. non-repeatability, zero offset and span setting errors at reference temperature.
Total Error Band Accuracy (TEB):	±1.0% of Span: From 0 ºC to 85 ºC (32 ºF to 185 ºF) ±2.0% of Span: From 85 ºC to 125 ºC (185 ºF to 257 ºF) ±2.0% of Span: From -40 ºC to 0 ºC (-40 ºF to 32 ºF) Includes the combined effects of non-linearity (Terminal Point Method), hysteresis, non-repeatability, temperature and zero offset and span setting errors
Stability:	≤ ±0.25% of span/year
Durability:	50 million cycles
Approvals:	CE, ROHS, UL Recognized component per UL 61010-1, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

Environmental Specifications

Temperature Limits:	Storage: -58 °F to 257 °F (-50 °C to +125 °C) Operating: -40 °F to 257 °F (-40 °C to +125 °C) Ambient: -40 °F to 221 °F (-40 °C to +105 °C)
Humidity Effects:	0 to 100% R.H., ± .05% typical

Functional Specifications

Vibration Effects:	Random vibration (20 g) RMS; 20-2000 Hz per IEC 60068-6-4
Shock Effects:	100 Gs, 6 msec
Drop Test:	Withstands 1 meter on concrete

Functional Specifications

Response Time:	< 5 msec
Warm-up Time:	< 20 msec
Position Effect:	< ±0.015% span typical

Electrical Specifications

Insulation Withstand Voltage:	500 Vac
Insulation Resistance:	>100 MOhms @ 100 Vdc
Circuit Protection:	Reverse polarity and miswire protection (excludes ratiometric output)

Continued on page 2

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S1 Pressure Transducer

Output Signals Available

Voltage Output	Excitation	Max Supply Current
0-5 Vdc, 3 wire	9-32 Vdc	11 mA
0-10 Vdc, 3 wire	14-32 Vdc	11 mA
1-5 Vdc, 3 wire	9-32 Vdc	5 mA
1-6 Vdc, 3 wire	9-32 Vdc	5 mA
1-10 Vdc, 3 wire	14-32 Vdc	11 mA
0.1-10 Vdc, 3 wire	14-32 Vdc	11 mA
0.5-4.5 Vdc, 3 wire	9-32 Vdc	5 mA
Ratiometric Output		
0.5-4.5 Vdc, 3 wire	5 Vdc ±0.5 Vdc	5 mA
Current Output		
4-20 mA, 2 wire	9-32 Vdc	

Environmental Rating

Rating:	Electrical Connections
IP67, NEMA 6X	Metri-Pack® shielded cable, Deutsch®, DT/DTM, AMP® Econoseal®/Superseal®, and M12
IP65, NEMA 4X	EN 175301-803 Form A & C (DIN 43650 A & C)

Wetted Components

Sensor Diaphragm:	17-4 PH with 303 stainless steel adapter for 304 stainless steel process connection and housing. 316L with 316L stainless steel adapter for 316L stainless steel process connection and housing
Process Connection	304 or 316 stainless steel. Contact Ashcroft for additional material options.

Non-Wetted Components

Housing:	304 or 316 stainless steel. Contact Ashcroft for additional material options.

EMC Testing

EMC:	Directive 2014/30/EU, and EN61326-1, EN61326-2-3 (Industrial Env.)	
Immunity:	61000-4-2 (ESD)	±4 kV/±8 kV (Contact/Air)
	61000-4-3 (Radiated RF)	10 V/m to 1 GHZ, 3 V/m to 2 GHz, 1 V/m to 2.7 GHz
	61000-4-4 (EFT/Burst)	±1 kV (5/50 msec, 5 kHz)
	61000-4-5 (Surge)	±1 kV, Earth to Shield over all I/O lines
	61000-4-6 (Conducted RF)	3 V/ (0.15 to 80 MHz)
	61000-4-8 (Line Freq. Magnetic)	30 A/m
Emissions:	EN 55011 (CISPR 11) Class A, Group 1 & FCC (47 CFR 15)	

TruAccuracy™ What Does It Mean?

Ashcroft's TruAccuracy™ specification is exclusively based on terminal point methodology instead of statistically derived schemes like 'best fit straight line'.

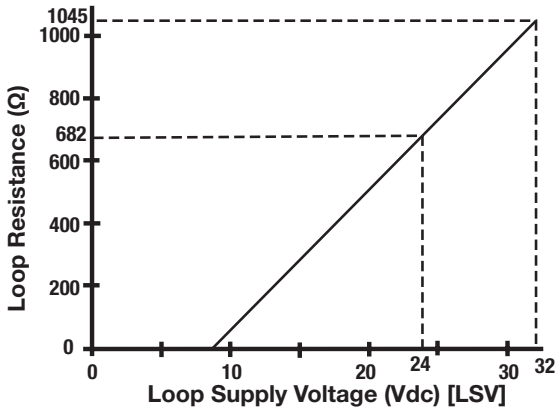
TruAccuracy™ means the Ashcroft S1 has standard span accuracy of ±1.00% with option to purchase as ±0.50% out of the box. Zero and span setting errors are already included in the standard ±1.00% or optional ±0.50% of span accuracy spec

The S1 is ready to be installed with no additional calibration adjustments required.

A unit from another manufacturer advertised as ±0.25% best fit straight line may actually be a ±1.25% to ±2.25% device. Using best fit straight line method, the accuracy spec does not include zero and span setting errors, which can be as much as ±1.00% each.

Power Supply & Load Resistance

Power Supply Voltage vs. Loop Resisitance (4-20 mA ONLY)



V_{MIN} = 9V + [0.022A* x (R_L)]
(*includes a 10% safety factor)
$R_L = R_S + R_W$
R_L = Loop Resistance (Ohms)
R_S = Sense Resistance (Ohms)
Rw = Wire Resistance (Ohms)
Rw's w is a subscript

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S1 Pressure Transducer

Ordering Code Example:	S1	7	S	0	MEK	42	GN	60#	XTU
Model									
S1 - Pressure Transducer	S1								
Accuracy									
5 - ± 0.50% span									
7 - ± 1.00% span		7							
Fitting Material									
L - 316 Stainless steel (max pressure range 3,000 psi)									
S - 304 Stainless steel (max pressure range 10,000 psi)			S						
Fitting Finish									
0 - No Plating				0					
Pressure Connection Size									
FGA - G ¼ A - Female									
FS7 - 7/16-20 UNF-2B Female (¼ in. SAE) Flare Internal Thread w/Schrader Depressor									
F01 - ⅛ NPT - Female									
F02 - ¼ NPT - Female									
F09 - 9/16-18 - Female (¼ HiP)									
MB1 - M10x1.25 Banjo - Single									
MEK - 7/16 20 SAE #4 - Male					MEK				
MEH - 9/16-18 UNF-2A SAE J1926-2 “Heavy w/Buna-N O-ring Duty” - Male									
MEV - 9/16-18 SAE #6 Male w/Buna-N O-ring									
MGA - G ¼ A - Male									
MG1 - G ⅛ B - Male									
MG2 - G ¼ B - Male									
MG4 - G ½ B - Male									
MM4 - M14x1.5 ISO 6149-2 “Heavy Duty” - Male									
M01 - ⅛ NPT - Male									
M02 - ¼ NPT - Male									
M04 - ½ NPT - Male									
M15 - M14 x 1.5 [Form E]									
M45 - 7/16-20 Flare 45°									
M76 - 7/16-20 Flare 37°									
Output Signal									
05 - 0-5 Vdc									
09 - 1-10 Vdc									
10 - 0-10 Vdc									
12 - 0.1-10 Vdc									
15 - 1-5 Vdc									
16 - 1-6 Vdc									
42 - 4-20 mA						42			
RM - 0.5 - 4.5 Vdc Ratiometric to 5 Vdc supply									

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S1 Pressure Transducer

Ordering Code (continued) Example:	S1	7	S	0	MEK	42	GN	60#	XTU
Electrical Termination (See PINOUTS and DIMENSIONS sections for specific part code pinout descriptions)									
EN 175301-803 Form C (DIN 43650, Form C) elec conn add conn part code:									
DC - No mating connector									
N1 - With matting connector (PG 7 cable gland outlet)									
EN 175301-803 Form A (DIN 43650, Form A) elec conn add part codes:									
DA - No mating connector									
D0 - With mating connector (PG 9 cable gland outlet)									
CD - With mating connector (½ NPT female conduit cable outlet)									
M12 - 4 Pin with molded thread									
EW - M12 (no mating connector)									
GW - M12 (no mating connector)									
LW - M12 (no mating connector)									
RW - M12 (no mating connector)									
M12 - 4 Pin with metal thread									
EX - M12 with Pin 3 as Common (no mating connector)									
GX - M12 (no mating connector)									
LX - M12 (no mating connector)									
RX - M12 with Pin 4 as Common (no mating connector)									
Shielded cable with PVC jacket and 24 AWG leads									
FA - 1 foot									
FB - 1 meter									
FC - 10 feet									
FD - 5 Meters									
FE - 20 feet									
Metri-Pack®									
GN - No mating connection							GN		
AMP® Econoseal®									
JN - No mating connection									
Deutsch® DT Series DT04-3P									
DT - Without mating connector									
DR - Without mating connector									
AMP® Superseal®									
AP - No mating connector									
Deutsch® DT Series DT04-4P									
DU- Without mating connector									
Deutsch® DTM Series DTM04-3P									
DS - Without mating connector									
Pressure Ranges (see range table on page 4)									
60# - 60 psi								60#	
Option (if including an option(s) must include an "X")									X __ _
TU- Throttle plug									TU
P9 - Individual packing									
6B - Clean for oxygen service									

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S1 Pressure Transducer

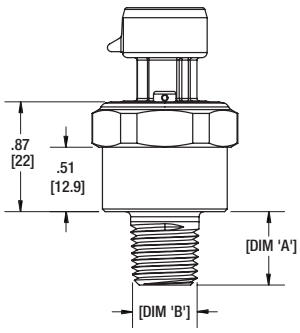
S1 Pressure Range Table

Operating Pressure Range (PSI)	Fitting Material		Overpressure	
	S 304 SS	L 316L SS	Proof	Burst
0 psi/-14.7 psi	X	X	2X	50X
15 psi/-14.7 psi	X	X	2X	50X
30 psi/-14.7 psi	X	X	2X	50X
45 psi/-14.7 psi	X	X	2X	50X
60 psi/-14.7 psi	X	X	2X	50X
75 psi/-14.7 psi	X	X	2X	50X
100 psi/-14.7 psi	X	X	2X	5X
150 psi/-14.7 psi	X	X	2X	5X
200 psi/-14.7 psi	X	X	2X	5X
300 psi/-14.7 psi	X	X	2X	5X
15 psi	X	X	2X	50X
30 psi	X	X	2X	50X
45 psi	X	X	2X	50X
50 psi	X	X	2X	50X
60 psi	X	X	2X	50X
75 psi	X	X	2X	50X
100 psi	X	X	2X	5X
150 psi	X	X	2X	5X
200 psi	X	X	2X	5X
250 psi	X	X	2X	5X
300 psi	X	X	2X	5X
400 psi	X	X	2X	5X
500 psi	X	X	2X	5X
650 psi	X	X	2X	5X
750 psi	X	X	2X	5X
1,000 psi	X	X	2X	5X
1,500 psi	X	X	2X	5X
2,000 psi	X	X	2X	5X
2,500 psi	X	X	2X	5X
3,000 psi	X	X	2X	5X*
4,000 psi	X		1.5X	4X
5,000 psi	X		1.5X	4X
6,000 psi	X		1.5X	3X
7,500 psi	X		1.5X	3X
10,000 psi	X		1.2X	3X

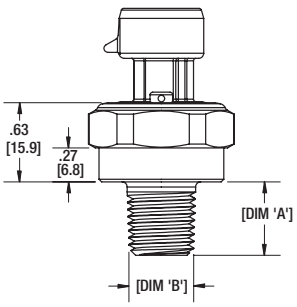
- ksc, bar, kPa, and mPa ranges also available.
- Enhanced proof and burst overpressure may be available on request.
- *Burst rating for 3000 psi with 316L SS is 3X

Dimensions are identified in inches and [millimeters]

For reference only, consult Ashcroft for specific dimensional drawings.



LOW PRESSURE
(RANGES LESS THAN 100 PSI)



HIGH PRESSURE
(RANGES GREATER THAN
OR EQUAL TO 100 PSI)

Pressure Connection General Dimensions

Pressure Conn. Code	Thread	Dimension A in [mm]	Dimension B in [mm]	Max Pressure (material not considered)
FGA	G ¼ A - Female	.78 [19.7]	.87 [22.1]	10,000 psi
FS7	7/16-20 UNF-2B Schrader - Female	.75 [19.2]	.75 [19.1]	2,000 psi
F01	1/8-27 NPT - Female	.71 [18.0]	.75 [19.1]	10,000 psi
F02	¼-18 NPT - Female	.68 [17.3]	.75 [19.1]	10,000 psi
F09	9/16-18 UNF-2B - Female	.69 [17.5]	.81[20.6]	10,000 psi
MB1	M10x1.25 Banjo - Single	.79 [20.0]	.39 [9.9]	6,000 psi
MEH	9/16-18 UNF-2A SAE J1926-2 "Heavy Duty" - Male	.47 [12.0]	.48 [12.2]	10,000 psi
MEK	7/16-20 UNF-2A SAE #4 - Male	.43 [11.0]	.44 [11.2]	10,000 psi
MEV	9/16-18 UNF-2A SAE #6 - Male	.47 [12.0]	.56 [14.2]	10,000 psi
MGA	G ¼ A - Male	.58 [14.7]	.52 [13.2]	10,000 psi
MG1	G 1/8 B - Male	.39 [10.0]	.38 [9.7]	5,800 psi
MG2	G ¼ B - Male	.59 [15.0]	.52 [13.2]	10,000 psi
MG4	G ½ B - Male	.90 [22.9]	.71 [18.0]	10,000 psi
MM4	M14x1.5 ISO 6149-2 "Heavy Duty" - Male	.43 [11.0]	.46 [11.7]	10,000 psi
M01	1/8-27 NPT - Male	.47 [12.0]	.42 [10.7]	10,000 psi
M02	¼-18 NPT - Male	.58 [14.7]	.53 [13.5]	10,000 psi
M04	1/2-14 NPT- Male	.78 [19.7]	.84 [21.3]	10,000 psi
M15	M14 x 1.5 [Form E] (DIN 3852-11/ISO 9974-2)	.47 [12.0]	.46 [11.7]	10,000 psi
M45	7/16-20 Flare 45°	.55 [14.0]	.44 [11.2]	10,000 psi
M76	7/16-20 Flare 37°	.55 [14.0]	.55 [14.0]	10,000 psi

Note 1: Dim 'B' Measured to thread OD
Note 2: Dimensions in [ ] are millimeters

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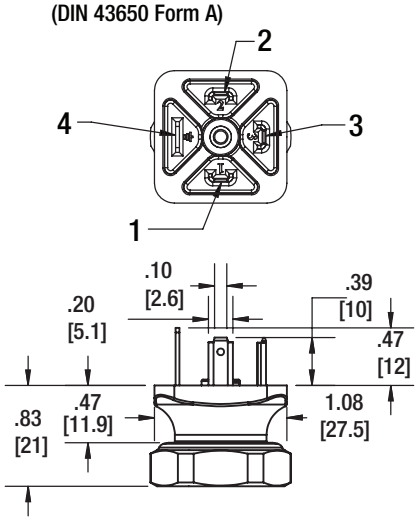
Dimensions are identified in inches and [millimeters]

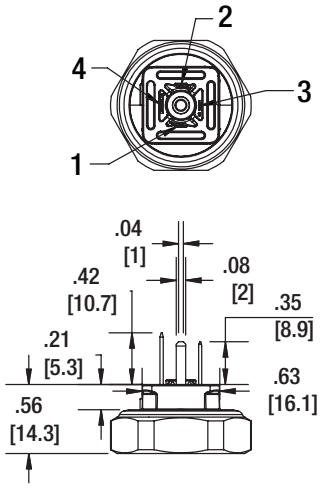
For reference only, consult Ashcroft for specific dimensional drawings.

DA - EN17530-803 Form A (DIN 43650 Form A)



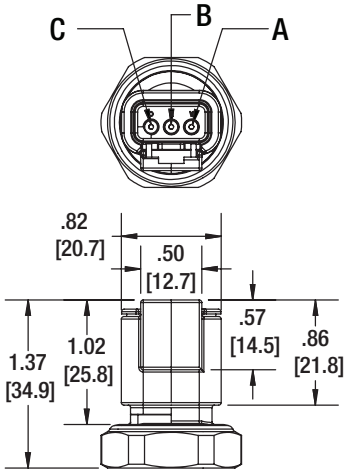
Din Form A		
Pin #	Voltage Function	Current Function
1	V+	V+
2	V- (Common)	V-
3	Output	V-
4	Ground	Ground

DC - EN17530-803 Form C (DIN 43650 Form C)



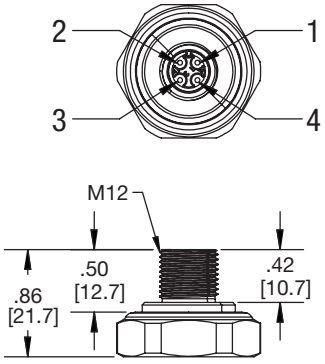
Din Form C		
Pin #	Voltage Function	Current Function
1	V+	V+
2	V- (Common)	V-
3	Output	V-
4	Ground	Ground

DS - Deutsch® DTM04-3P

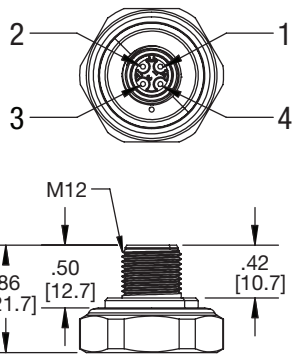


Deutsch® DTM04-3P		
Pin #	Voltage Function	Current Function
A	V+	V+
B	V- (Common)	V-
C	Output	V-

EW/RW/GW/LW (Plastic Threads)



EX/RX/GX/LX (Metal Threads)



M12-4P Pin-out Type 1 (EW/EX))		
Pin #	Voltage Function	Current Function
1	V+	V+
2	Ground	Ground
3	V-	V-
4	Output	V-

M12-4P Pin-out Type 2 (RW/RX)		
Pin #	Voltage Function	Current Function
1	V+	V+
2	Output	V-
3	Ground	Ground
4	V-	V-

M12-4P Pin-out Type 3 (GW/GX)		
Pin #	Voltage Function	Current Function
1	V+	V+
2	V-	V-
3	Ground	Ground
4	Output	V-

M12-4P Pin-out Type 4 (LW/LX)		
Pin #	Voltage Function	Current Function
1	V+	V+
2	Output	V-
3	V-	V-
4	V-	V-

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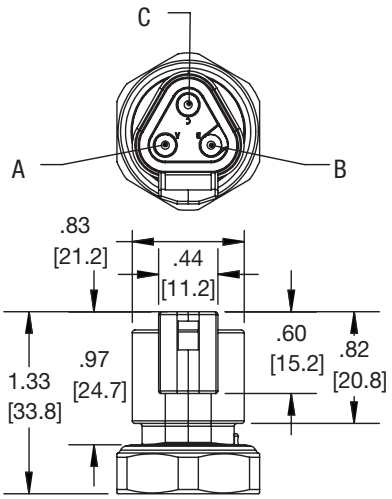
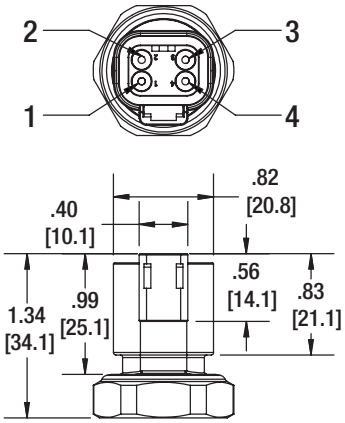
Deutsch® DT04-3P



DU - Deutsch® DT04-4P

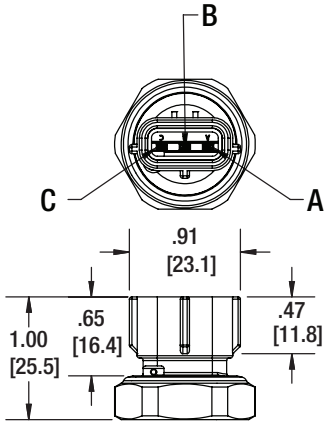


Pin-out Type 1 (DT)		
Pin #	Voltage Function	Current Function
A	V+	V+
B	V-	V-
C	Output	V-

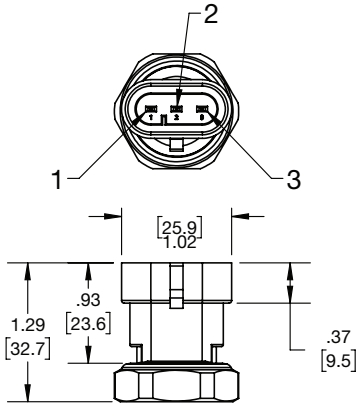
Pin-out Type 2 (DR)		
Pin #	Voltage Function	Current Function
A	V+	V+
B	Output	V-
C	V-	V-

Deutsch® DT04-4P		
Pin #	Voltage Function	Current Function
1	V- (Common)	V-
2	V+	V+
3	Ground	Ground
4	Output	V-

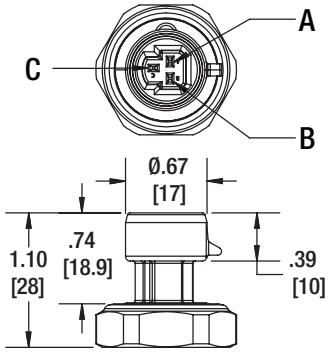
JN - AMP® Econoseal®



AMP Superseal



GN - Metri-Pack®



AMP® Econoseal®		
Pin #	Voltage Function	Current Function
A	V+	V+
B	V- (Common)	V-
C	Output	V-

AMP Superseal		
Pin #	Voltage Function	Current Function
1	V-	V-
2	Output	V-
3	V+	V+

Metri-Pack®		
Pin #	Voltage Function	Current Function
A	V- (Common)	V-
B	V+	V+
C	Output	V-

For Pinouts, use either V- termination on S1 with 4-20mA output

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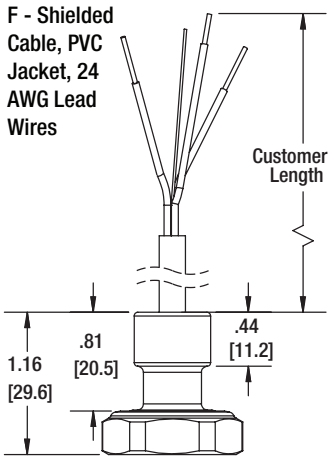
S1 Pressure Transducer

Dimensions are identified in inches and [millimeters]



Shielded Cable		
Pin #	Voltage Function	Current Function
Red	V+	V+
Black	Common	V-
White	Output	n/a
Drain	n/a	n/a