

## Data Sheet

# 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 sensor element
- Field proven polysilicon thin film pressure sensor
- Ranges 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

### SPECIFICATIONS

Reference Temperature: 72 °F ±2 °F (21 °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 °C to 85 °C (32 °F to 185 °F)  
±2.0% of Span: From 85 °C to 125 °C (185 °F to 257 °F)  
±2.0% of Span: From -40 °C to 0 °C (-40 °F to 32 °F)  
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/UKCA, 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 60068-64

Shock Effects: 100 gs, 6 ms

Drop Test: Withstands 1 meter on concrete



S1 Pressure Transducer



### KEY BENEFITS

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

### FUNCTIONAL SPECIFICATIONS

Response Time: < 5 msec

Warm-up Time: < 20 msec

Position Effect: < ±0.015% span typical

Overpressure (F.S):	Proof	Burst
<100 psi	2 X Range	50 X Range
≥100 to 3,000 psi	2 X Range	5 X Range
≥3,000 to 5,000 psi	1.5 X Range	4 X Range
≥5,000 to 7,500 psi	1.5 X Range	3 X Range
≥7,500 to 10,000 psi	1.2 X Range	3 X Range

### ELECTRICAL SPECIFICATIONS

Insulation Withstand Voltage: 500 Vac

Insulation Resistance: >100 MOhms @ 100 Vdc

Circuit Protection: Reverse polarity and miswire protection (excludes ratiometric output)

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# Data Sheet

## S1 Pressure Transducer

### OUTPUT SIGNALS AVAILABLE

Voltage Output	Excitation	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
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®, 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 aluminum, brass, carbon steel & 304 stainless steel process connections and housings. 316L with 316L stainless steel adapter for 316L stainless steel process connection and housing
Process Connection	Options of aluminum, brass, carbon steel, 304 or 316L stainless steel

### NON-WETTED COMPONENTS

Housing:	Options of aluminum, brass, carbon steel, 304 or 316L stainless steel
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### 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 ns, 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'.

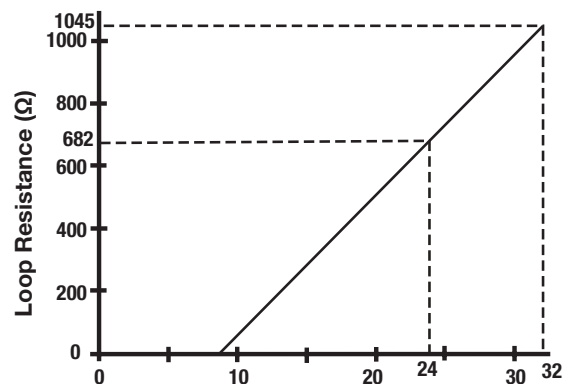
TruAccuracy™ means the Ashcroft S1 has standard span accuracy of ±1.00% with option to purchase as ±0.50% out of the box. Zero and span setting errors are already included in the standard ±1.00% or optional ±0.50% of span accuracy spec

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 Resistance (4-20 mA ONLY)



$$V_{\text{MIN}} = 9V + [0.022A * x (R_L)]$$

(\*includes a 10% safety factor)

$$R_L = R_S + R_W$$

$R_L$  = Loop Resistance (Ohms)

$R_S$  = Sense Resistance (Ohms)

# Data Sheet

## S1 Pressure Transducer

ORDERING CODE	Example:	S1	7	S	0	MEK	42	GN	60#	XTU
<b>Model</b>										
S1 - Pressure Transducer		S1								
<b>Accuracy</b>										
5 ± 0.50% span										
7 ± 1.00% span			7							
<b>Fitting Material</b>										
A - Aluminum (max pressure range 3000 psi)										
B - Brass (max pressure range 4000 psi)										
C - Low carbon steel (max pressure range 10,000 psi)										
L - 316 Stainless steel (max pressure range 3,000 psi)										
S - 304 Stainless steel (max pressure range 10,000 psi)				S						
<b>Fitting Finish</b>										
B - Anodized Blue (Only available with A fitting material - Aluminum)										
Z - Zinc Chromate (Only available with C fitting material - Low carbon steel)										
C - Custom										
0 - No Plating					0					
<b>Pressure Connection Size</b>										
FGA - G ¼ A - Female										
FS7 - 7/16-20 UNF-2B Female (¼ in. SAE) Flare Internal Thread w/Schrader Depressor										
F02 - ¼ NPT - Female										
F09 - 9/16-18 - Female (¼ HiP)										
MB1 - M10x1.25 Banjo - Single										
MEK - 7/16 20 SAE #4 - Male						MEK				
MEV - 9/16-18 SAE #6 Male w/Buna-N O-ring										
MGA - G ¼ A - Male										
MG1 - G ¼ B - Male										
MG2 - G ¼ B - Male										
MG4 - G ½ B - Male										
M01 - ¼ NPT - Male										
M02 - ¼ NPT - Male										
M45 - 7/16-20 Flare 45°										
M76 - 7/16-20 Flare 37°										
<b>Output Signal</b>										
05 - 0-5 Vdc										
10 - 0-10 Vdc										
15 - 1-5 Vdc										
16 - 1-6 Vdc										
42 - 4-20 mA							42			
RM - 0.5 - 4.5 Vdc Ratio metric to 5 Vdc supply										
45 - 0.5 - 4.5 Vdc Non-Ratio metric to 9-32 Vdc supply										
<b>Electrical Termination (See PINOUTS and DIMENSIONS sections for specific part code pinout descriptions)</b>										
<b>EN 175301-803 Form C (DIN 43650, Form C)</b>										
DC - No mating connector										
<b>EN 175301-803 Form A (DIN 43650, Form A)</b>										
DA - No mating connector										
<b>M12 - 4 Pin with molded thread</b>										
EW - M12 (no mating connector)										
GW - M12 (no mating connector)										
LW - M12 (no mating connector)										
RW - M12 (no mating connector)										
<b>M12 - 4 Pin with metal thread</b>										
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)										
<b>Shielded cable with PVC jacket and 24 AWG leads</b>										
FA - 1 foot										
FB - 1 meter										
FC - 10 feet										
FD - 5 Meters										
FE - 20 feet										
<b>Metri-Pack®</b>										
GN - No mating connection								GN		
<b>AMP® Econoseal®</b>										
JN - No mating connection										
<b>Deutsch® DT Series DT04-3P</b>										
DT - Without mating connector										
DR - Without mating connector										
<b>Deutsch® DT Series DT04-4P</b>										
DU - Without mating connector										
<b>Deutsch® DTM Series DTM04-3P</b>										
DS - Without mating connector										
<b>Pressure Ranges (see range table on page 4)</b>										
60# - 60 psi									60#	
<b>Option (if including an option(s) must include an "X")</b>										
TU - Throttle Plug										X
P9 - Individual Packing										TU

# S1 Pressure Transducer

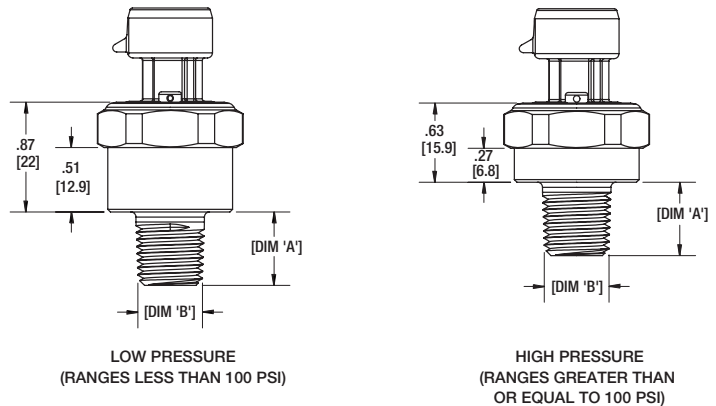
## S1 RANGE TABLE

PSI	A Aluminum	B Brass	C Carbon Steel	S 304 SS	L 316L SS
0 psi/-14.7 psi	X	X	X	X	X
15 psi/-14.7 psi	X	X	X	X	X
30 psi/-14.7 psi	X	X	X	X	X
45 psi/-14.7 psi	X	X	X	X	X
60 psi/-14.7 psi	X	X	X	X	X
75 psi/-14.7 psi	X	X	X	X	X
100 psi/-14.7 psi	X	X	X	X	X
150 psi/-14.7 psi	X	X	X	X	X
200 psi/-14.7 psi	X	X	X	X	X
300 psi/-14.7 psi	X	X	X	X	X
15 psi	X	X	X	X	X
30 psi	X	X	X	X	X
45 psi	X	X	X	X	X
50 psi	X	X	X	X	X
60 psi	X	X	X	X	X
75 psi	X	X	X	X	X
100 psi	X	X	X	X	X
150 psi	X	X	X	X	X
200 psi	X	X	X	X	X
250 psi	X	X	X	X	X
300 psi	X	X	X	X	X
400 psi	X	X	X	X	X
500 psi	X	X	X	X	X
650 psi	X	X	X	X	X
750 psi	X	X	X	X	X
1,000 psi	X	X	X	X	X
1,500 psi	X	X	X	X	X
2,000 psi	X	X	X	X	X
2,500 psi	X	X	X	X	X
3,000 psi	X	X	X	X	X
4,000 psi		X	X	X	X
5,000 psi			X	X	
6,000 psi			X	X	
7,500 psi			X	X	
10,000 psi			X	X	

ksc, bar, kPa, and mPa ranges also available

## DIMENSIONS are identified in inches and [millimeters]

For reference only, consult Ashcroft for specific dimensional drawings.



## 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
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
MEK	7/16-20 UNF-2B 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 ½ 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
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
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

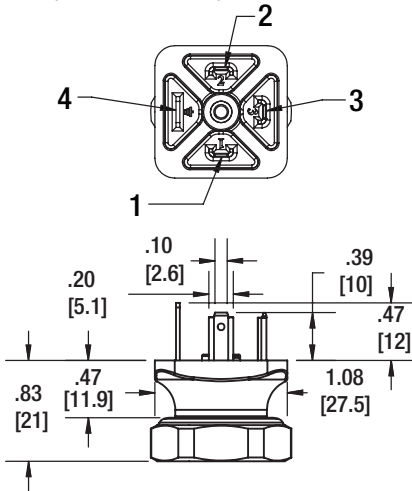
# Data Sheet

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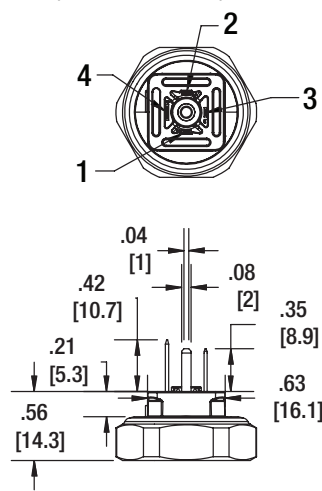
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DA - EN17530-803 Form A  
(DIN 43650 Form A)



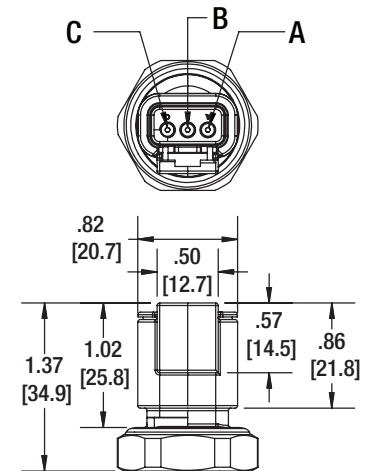
Din Form A		
Pin #	Voltage Function	Current Function
1	V+	V+
2	V- (Common)	V-
3	Output	V-
4	Ground	Ground

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



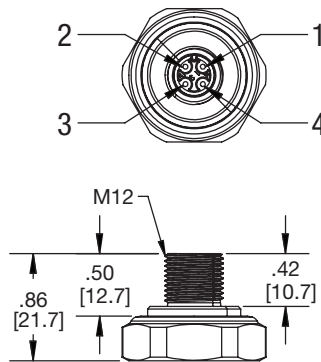
Din Form C		
Pin #	Voltage Function	Current Function
1	V+	V+
2	V- (Common)	V-
3	Output	V-
4	Ground	Ground

DS - Deutsch® DTM04-3P

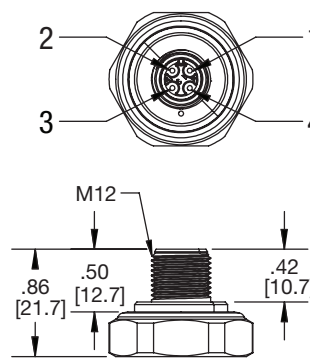


Deutsch® DTM04-3P		
Pin #	Voltage Function	Current Function
A	V+	V+
B	V- (Common)	V-
C	Output	V-

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-

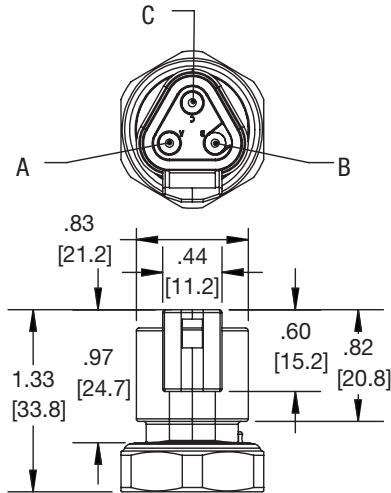
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## S1 Pressure Transducer

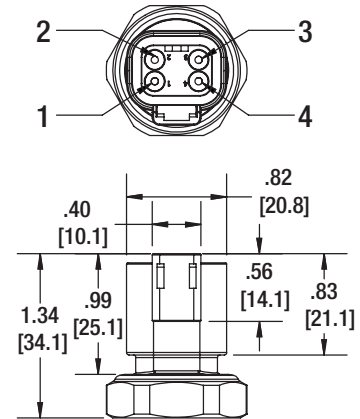
**DIMENSIONS** are identified in inches and [millimeters]

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Deutsch® DT04-3P



DU - Deutsch® DT04-4P

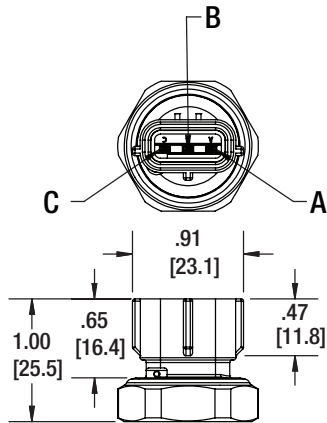


Pin-out Type 1 (DT)		
Pin #	Voltage Function	Current Function
A	V+	V+
B	V-	V-
C	Output	V-

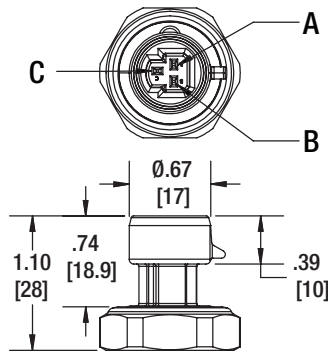
Pin-out Type 2 (DR)		
Pin #	Voltage Function	Current Function
A	V+	V+
B	Output	V-
C	V-	V-

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

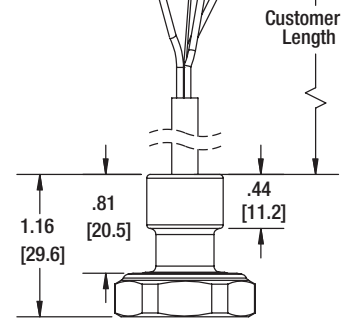
JN - AMP® Econoseal®



GN - Metri-Pack®



F - Shielded Cable, PVC Jacket, 24 AWG Lead Wires



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

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

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

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