ULTRA | Energy

DTC3 differential pressure transmitter

Key features

- True analog design – no microprocessor or firmware/software
- Dustproof and waterproof construction, no humidity effect
- Mounted using the Rosemount 1151 mounting bracket
- Local test points for field adjustability
- No special tools required for installation

Overview

The DTC3 is an analog differential pressure transmitter designed and manufactured by Ultra Energy for non-safety nuclear applications. It is a drop-in replacement for the almost ubiquitous but now discontinued Rosemount™ 1151 analog pressure transmitter. The DTC3 provides precision pressure measurements in applications requiring reliable performance and functional safety. It has a true analog design with no microprocessors, firmware or required software and was developed to offer differential, gauge and absolute pressure measurement. With reduced calibration times, the DTC3 offers significantly reduced installation times.

ULTRA | Energy

Technical data

Feature	Description
Reference accuracy	±0.2% span, includes combined effects of linearity, hysteresis, deadband, settability and repeatability
Drift	±0.25% of URL for six months
Temperature effects	±0.5% URL +0.5% of span temperature effect per 100°F (56°C)
Overpressure effects (per 1000 psi)	±0.25% URL ±1.0 % URL two-way
Overpressure and static pressure limit	2550 psi
High static line pressure zero effect	±0.25% URL for 1,000 psi (6.89 MPa) static pressure change, correctable by re-zeroing at line pressure
Electromagnetic compatibility	European EMC Directive 2014/30/EU by conforming to applicable EN and IEC Standards: compliance testing to the EN 61000 Series standards, CE Marking, declaration of conformity
Power supply effects	0.005% of calibration span/volt
Load effect	With limits set by the line voltage, the output current is independent of load resistance
Power supply and load limits (10-50 mA option available)	Operating region: 4-20 mA: 12-45 VDC, 10-50 mA: 30-85 VDC
Span and zero	Continuously adjustable external to the electronics, non-interacting
Zero elevation, zero suppression	Elevated zero and zero suppression must be factory set in order to achieve the specified temperature performance

ULTRA | Energy

Technical data

Feature	Description
Direct or reverse acting	Factory set
Range-down	6 to 1 (Min. span is 16.7% URL)
Output 4-20 mA standard	Low saturation <3.8 mA, high saturation 21 mA
Output 10-50 mA option	Low saturation <8 mA, high saturation 52.5 mA
Temperature limits	0°F-185°F (-17.8°C to 85°C). Storage limits: -40°F to 212 °F (-40°C to 100°C)
Volumetric displacement	Less than 0.1 cubic inches (1.6 cubic centimeters)
Enclosure Rating	NEMA 4X (IP 66)
Response Time	To 50% with a 100% of span step change @100°F (37.8°C); 30 inH2O, 2.5 seconds; 150 inH2O, 0.7 seconds; 750 inH2O, 0.4 seconds; 1000 inH2O and 100 psi, 0.25 seconds
Damping	Electronic damping continuously adjustable from 0 to 1.67 seconds
Humidity limits	0 to 100% relative humidity (NEMA 4X)
Turn-on time	5 seconds for 99%;1 minute for rated accuracy
Isolating Diaphragms	Hastelloy™ Alloy-C, Stainless 17-7 PH
Drain vent valve	316 SST
Process flange	316 SST

ULTRA | Energy

Technical data

Feature	Description
Process seal	EPDM
Electronics housing O-ring	BUNA-N
Fill Fluid	Silicone oil: DC550 standard, DC200 optional (faster response)
Sensor module housing	316 SST
Flange Bolt	Medium carbon alloy steel, SAE J429, grade 8, zinc yellow-chromate plated finish per ASTM B633
Electronics housing	Low-copper aluminum with polyurethane paint
Mounting bracket	304 SST
Mounting bolts	300 series stainless steel, ASTM F593
Process connections	¼-18 NPT standard, optional welded fittings or process adapters; IEC 61518 compliant
Electrical Connections	Half inch NPT conduit with screw terminals, standard
Weight (transmitter only)	14.7 lbs (6.7 kg)
Cable	Quick disconnect connector (QDC) mating cable
Gauge sensor technology	Advanced thin film metal strain
Further options	Loop powered, 2 wire, 4-20 mA, 10-50mA available

ULTRA | Energy

DTC3 model matrix

Model	Transmitter type	DP	GP	AP
DTC3DP	Differential pressure transmitter [1]	●		
DTC3GP	Gauge pressure transmitter [2]		●	
DTC3AP	Absolute pressure transmitter [2]			●
Capsule URL		**DP**	**GP**	**AP**
10	30 inH2O, 7.46kPa, 74.6 mBar	●	● [3]	
20	150 inH2O, 37.3 kPa, 373 mBar	●	● [3]	
30	750 inH2O, 186.5 kPa, 1865 mBar	●	● [3]	
40	2770 inH2O (100 psi) , 689.5 kPa, 6.895 Bar		●	●
50	300 psia/g, 2.068 MPa, 20.68 Bar		●	●
60	1000 psia/g, 6.895 MPa, 68.95 Bar		●	●
70	3000 psia/g, 20.68 MPa, 206.8 Bar		●	●
80	6000 psia/g, 41.4 MPa, 414 Bar		●	●
Transmitter output (select one)		**DP**	**GP**	**AP**
E	4-20 mA output with variable damping	●	●	●
G	10-50 mA output with variable damping	●	●	●

1. Transmitter is supplied with aluminum housing, 316 SS Flange and Diaphragm, 316 SS Bleed Valves, Plated Carbon Steel Bolts, and Silicone Fill Fluid.
2. Transmitter is supplied with aluminum housing, 316 SS Flange, 15/5 SS Diaphragm, Plated Carbon Steel Bolts, and Silicone Fill Fluid (GP only).
3. DP transmitter with low side screen vented to atmosphere in order to function as a GP transmitter.
4. Transmitter is supplied with direct acting output standard.
5. Transmitter is supplied with a terminal block electrical connection standard.
6. Transmitter is supplied with a 1/4" NPT process connection standard.
7. Transmitter is supplied with bleed valves installed and no side drain/vent standard.

ULTRA | Energy

DTC3 model matrix

Options		DP	GP	AP
Transmitter output action [4]				
R	Reverse acting output	●	●	●
Electrical Connection with dual cavity Al housing [5]				
C1	QDC	●	●	●
C2	Seal gland	●	●	●
C3	Souriau 8N45 connector	●	●	●
C4	Harting connector	●	●	●
Mounting bracket				
B0	4-20 mA output with variable damping	●	●	●
Process connection [6]				
P1	Welded 3/8" Swagelok process fitting	●	●	●
P2	1/2" process connection adapter (football)	●	●	●
P3	1/4" Pprocess connection adapter (football)	●	●	●
Drain/vent [7]				
D1	Side drain/vent top	●	●	●
D2	Side drain/vent bottom	●	●	●
Remote seals/capillaries				
RS	Consult factory (additional information required)	●	●	●

ultra.energy

DTC3DP - 30 G R - B0 P2 D1
DTC3 Differential Pressure Transmitter, 750 inH2O Range, 10-50 mA Output, Reverse Acting, Terminal Block Electrical Connection (no code), Universal Mounting Bracket, 1/2" Process Connection Adapter, Side Drain/Vent Top.

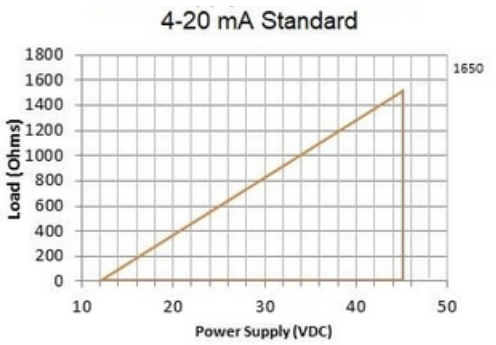
DTC3GP - 50 E - C1 B0 P1
DTC3 Gauge Pressure Transmitter, 300 psi Range, 4-20 mA output, Direct Acting (no code), EGS Connector, Universal Mounting Bracket, Welded 3/8" Swagelok Process Fitting.

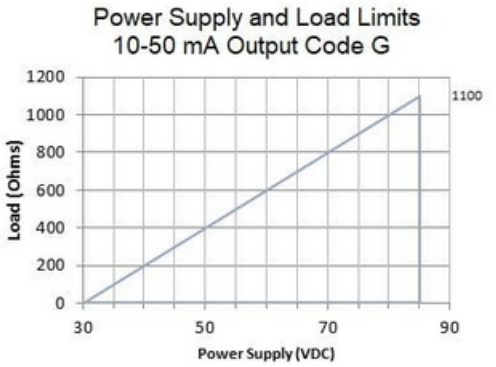
DTC3AP - 70 E - B0 D2
DTC3 Gauge Pressure Transmitter, 3000 psi Range, 4-20 mA output, Direct Acting (no code), Terminal Block Electrical Connection (no code), Universal Mounting Bracket, Side Drain/Vent Bottom.

ULTRA | Energy

Technical specifications

Power supply and load limits





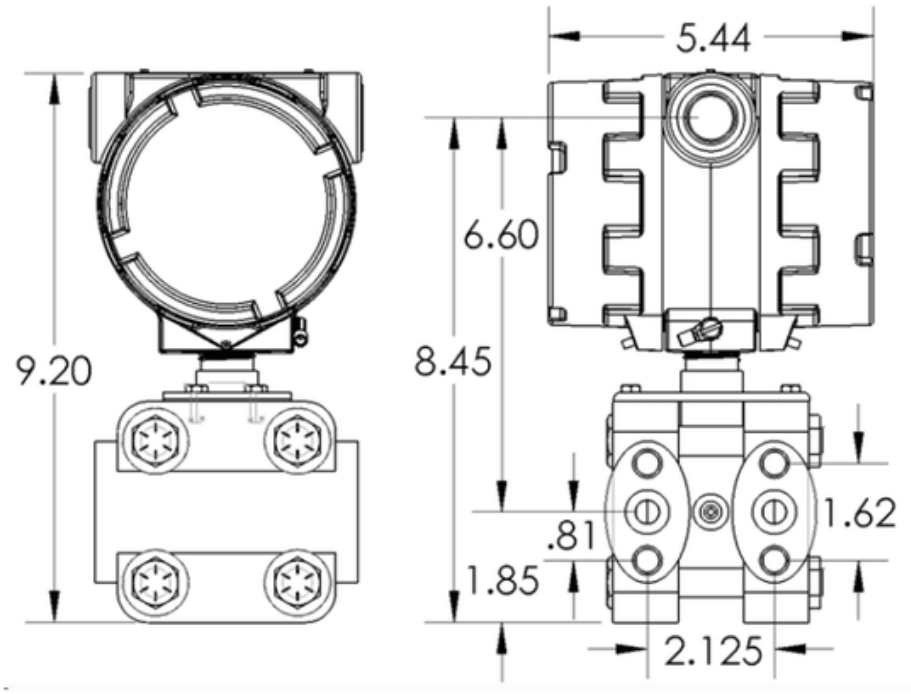
Can high static line pressure zero effect be calibrated out?

Yes, it can be calibrated out by the customer. If it is not calibrated out, the error associated with the effect is as follows: ±0.25% URL for 1,000 psi (6.89 MPa) static pressure change. Please note that suppressed or elevated zero ranges (where LRV is not 0) can't easily have their static pressure effect calibrated out.

DP ranges and limits

	Range Code	URL	Span Range	Static Pressure / Overpressure Limit
DP	10	± 30 inH2O	5 to 30 inH2O	2550 psi
DP	20	± 150 inH2O	25 to 150 inH2O	2550 psi
DP	30	± 750 inH2O	125 to 750 inH2O	2550 psi
DP	40	± 2770 inH2O	461.7 to 2770 inH2O	2550 psi
	Range Code	**URL**	**Span Range**	**Static Pressure / Overpressure Limit**
DP	10	± 7.46 kPa	1.24 to 7.46 kPa	17.58 MPa
DP	20	± 37.3 kPa	6.2 to 37.3 kPa	17.58MPa
DP	30	± 186.5 kPa	31.1 to 186.5 kPa	17.58 MPa
DP	40	± 689.5 kPa	114.9 to 689.5 kPa	17.58 MPa
	Range Code	**URL**	**Span Range**	**Static Pressure / Overpressure Limit**
DP	10	± 74.6 mBar	12.4 to 74.6 mBar	175.8 Bar
DP	20	± 373 mBar	.062 to .373 Bar	175.8 Bar
DP	30	± 1.865 Bar	.311 to 1.865 Bar	175.8 Bar
DP	40	± 6.895 Bar	1.15 to 6.895 Bar	175.8 Bar

DTC3 dimensions



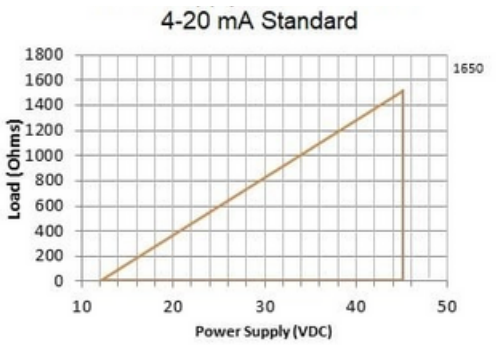
Specifications subject to change

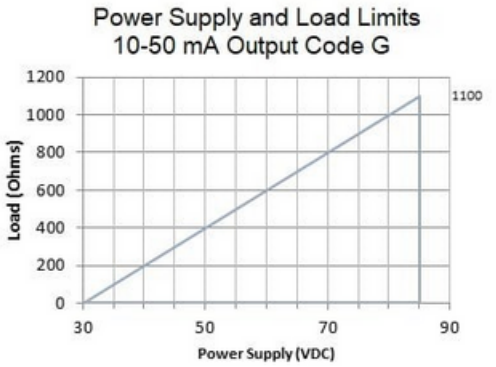
Specification is subject to change without notice. Transmitters are factory calibrated to the customer's specified range. If calibration is not specified, the transmitters are calibrated at maximum range. Calibration is performed at ambient temperature and pressure.

ULTRA | Energy

Technical specifications

Power supply and load limits





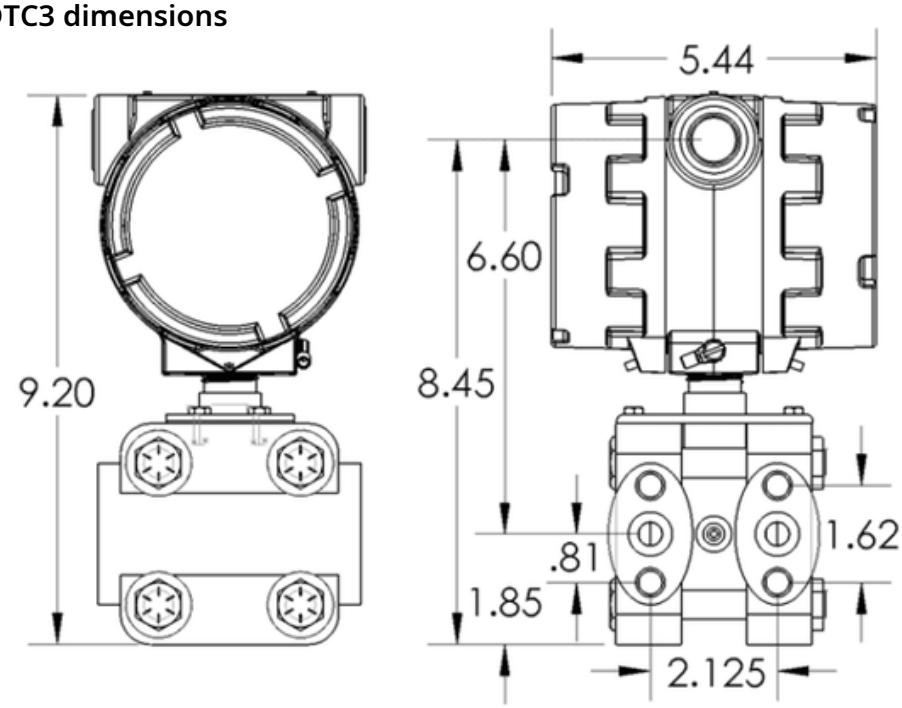
Can high static line pressure zero effect be calibrated out?

Yes, it can be calibrated out by the customer. If it is not calibrated out, the error associated with the effect is as follows: ±0.25% URL for 1,000 psi (6.89 MPa) static pressure change. Please note that suppressed or elevated zero ranges (where LRV is not 0) can't easily have their static pressure effect calibrated out.

DP ranges and limits

	Range Code	URL	Span Range	Static Pressure / Overpressure Limit
DP	10	± 30 inH2O	5 to 30 inH2O	2550 psi
DP	20	± 150 inH2O	25 to 150 inH2O	2550 psi
DP	30	± 750 inH2O	125 to 750 inH2O	2550 psi
	Range Code	**URL**	**Span Range**	**Static Pressure / Overpressure Limit**
DP	10	± 7.46 kPa	1.24 to 7.46 kPa	17.58 MPa
DP	20	± 37.3 kPa	6.2 to 37.3 kPa	17.58MPa
DP	30	± 186.5 kPa	31.1 to 186.5 kPa	17.58 MPa
	Range Code	**URL**	**Span Range**	**Static Pressure / Overpressure Limit**
DP	10	± 74.6 mBar	12.4 to 74.6 mBar	175.8 Bar
DP	20	± 373 mBar	.062 to .373 Bar	175.8 Bar
DP	30	± 1.865 Bar	.311 to 1.865 Bar	175.8 Bar

DTC3 dimensions



Specifications subject to change

Specification is subject to change without notice. Transmitters are factory calibrated to the customer's specified range. If calibration is not specified, the transmitters are calibrated at maximum range. Calibration is performed at ambient temperature and pressure.

ULTRA | Energy

About Ultra Energy

Organizations working with nuclear and industrial technologies must deliver reliable production at the same time as safeguarding people, the environment and infrastructure. We develop and manufacture measurement and control solutions that give our customers complete, long-term control over systems operating in harsh environments, helping them operate safely and increasing the value derived from their investments over their total lifespan.

Part of Ultra Group, a global electronics company, Ultra Energy has worked with nuclear and industrial customers for over 60 years. We support customers across the world from facilities located in the US and UK. Our solutions are embedded in strategic national infrastructure and our people are active partners in customer programs that are focused on delivering advanced future nuclear and industrial capabilities.

United States of America

707 Jeffrey Way
Round Rock
Texas 78665-2408
USA

Tel: +1 512-434-2800

United Kingdom

Innovation House
Lancaster Road
Ferndown Industrial Estate
Wimborne
Dorset BH21 7SQ
UK

Tel: +44 (0) 1202 850 450

For more information

Web: ultra.energy
Email: sales@ultra-nspi.com