

# C320 Booster Pump Controller

C320 – ensuring a continuous quality product every time



**Protection for the pasteurization process**

– ensuring a high quality, safe product for your customers

**High visibility LED displays**

– continuous indication of Raw and Pasteurization pressures

**IP66 (NEMA4X) enclosure**

– suitable for use in hosedown areas

**Dual analog output**

– for raw, pasteurization or differential pressure

**Three (5A) relays included as standard**

– booster pump, bypass valve and alarm

**Front face deviation bargraph**

– shows at a glance difference between raw and pasteurized signals

**Inbuilt transmitter power supplies**

– ability to power both loops in standard unit

**Range of hygienic pressure transducers**

– complete solution from one supplier

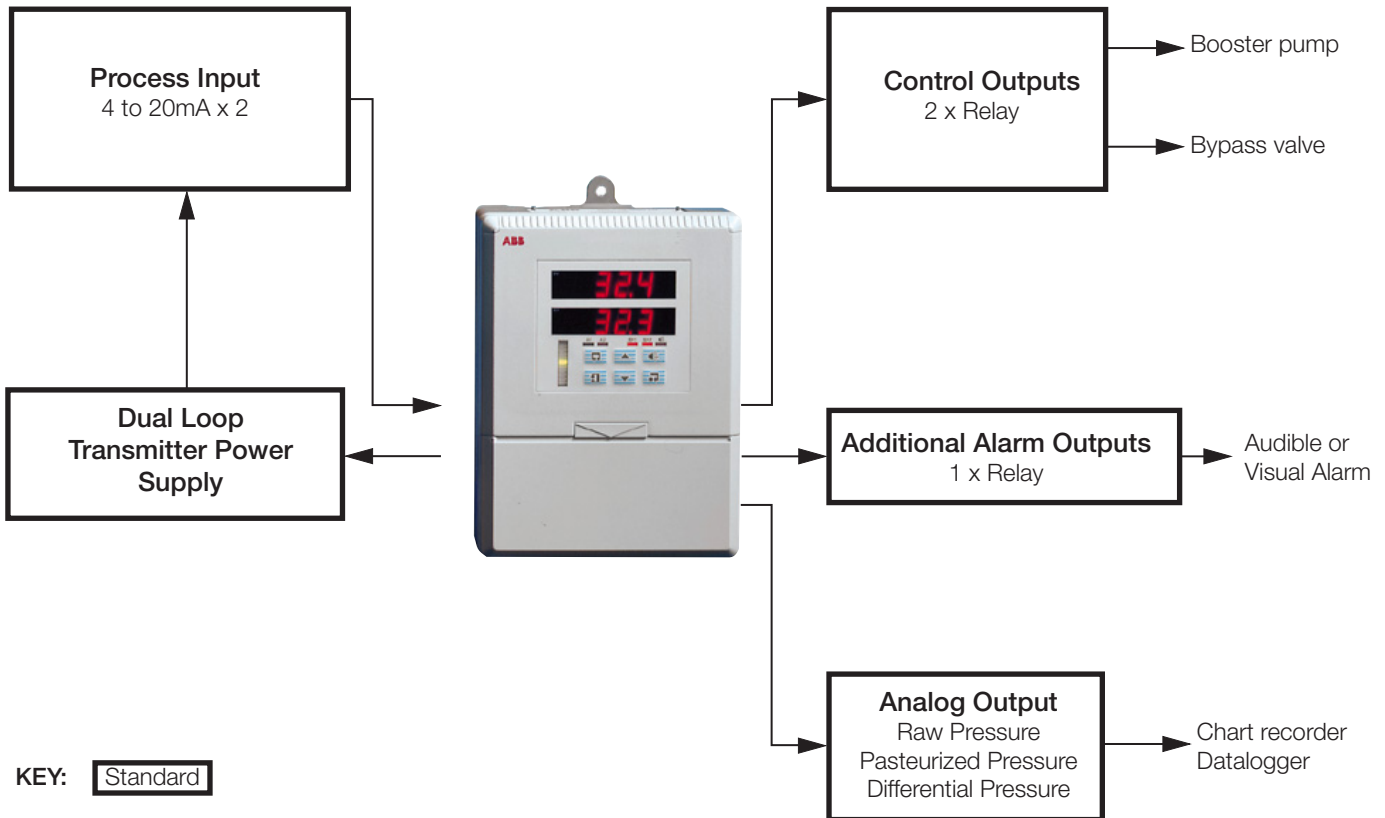


**C320**

The C320 is designed to act as a differential pressure switch for use in the regeneration section of a pasteurizer. The C320 is connected to two hygienic pressure sensors, one on the raw product side of the regenerator, the other on the pasteurized product side. If the difference in pressure falls below a preset value the C320 will stop the booster pump and switch the bypass valve.

Also included is an additional relay to activate a visual, or audible, alarm which can be acknowledged and de-energized via a dedicated button on the front facia.

Both of the input signals are also available as 4 to 20mA retransmission signals for datalogger or chart recorder.



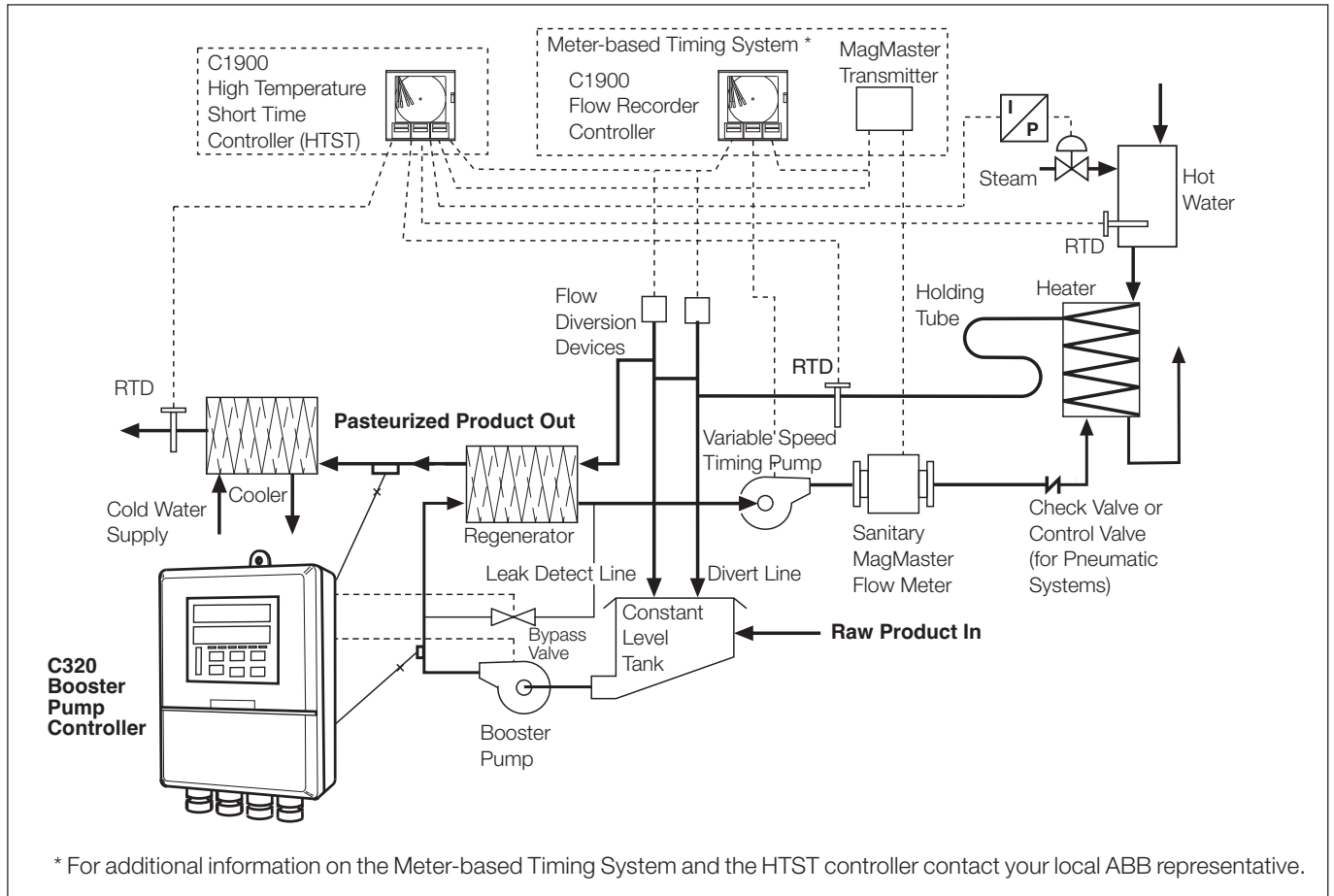
### Pasteurization Pressure Control

The C320 Booster Pump Controller has been specifically designed for use in the regeneration part of the pasteurization process. The regeneration unit is normally a heat exchanger, with the Raw product on one side being preheated by the pasteurized product on the other side. This system is designed to save money and process time by re-using heat already in the system.

The main drawback is that untreated product is very close to pasteurized product, only separated by a thin plate. Over time these plates can crack and untreated product could mix

with the pasteurized product. To stop this happening the pasteurized product is pressurized above the untreated product pressure; therefore if the plate does crack only pasteurized product can mix with untreated product.

The C320 is used in conjunction with the two Hygienic pressure transmitters to measure both pasteurized and untreated product pressures. If the difference falls below a preset level it stops the Booster pump and the activates bypass valve, thereby preventing the possible supply of untreated product.



Pasteurization Pressure Control Schematic

### Pasteurization – Control and Recording

Raw product is pumped from the constant level tank to the heating section where the temperature is raised to exceed the pasteurization low limit. The hot product temperature is measured and recorded at the end of the holding tube. Until the pasteurization limit is exceeded, the product is recycled to the constant level tank by the Flow Diversion Device. Once pasteurization temperature is exceeded, the hot product, through the forward flow port, is routed to the regenerator and

cooling sections of the heat exchanger. The red pen records and monitors the hot product pasteurization temperature. The violet pen records the position of the flow diversion valve, FDD. Both of these pens record on the same time line. The green pen records the selected diversion temperature, on multiple divert systems, where up to eight may be selected. The event pen can also indicate when the process is in CIP or secondary divert due to low pressure.



## Specification – C320

### Summary

C320 Booster Pump Controller  
Two analog inputs  
Three relays  
Two analog outputs  
IP66 (NEMA 4X) housing

### Operation

#### Display

High-intensity, 7-segment, 0.56 in. (14mm),  
2 x 6 red LED display  
11-element l.e.d. deviation bargraph

#### Configuration

User-defined via front panel

### Analog Inputs

#### Number

Two 4 to 20mA signals

#### Input sampling rate

160ms per channel

#### Input impedance

10 $\Omega$

#### Broken sensor protection

Programmable Up/Downscale or None

#### Input noise rejection

Common mode rejection >140dB at 50/60Hz with 500 $\Omega$   
imbalance  
Series mode rejection >60dB at 50/60Hz

#### Accuracy

Measurement error  $\leq \pm 0.2\%$  of reading or  $\pm 0.5\mu\text{A}$   
Display range -9999 to +9999

### Transmitter power supply

24V 60mA max. powers two loops, fitted as standard

### Outputs/Inputs

#### Relay outputs

Three relays – SPDT 5A 120/240V AC normally open or normally closed:

Relay 1 – for booster pump or bypass valve control  
Relay 2 – for booster pump or bypass valve control  
Relay 3 – for warning light or horn

#### Retransmission

4 to 20mA for Raw and Pasteurized Product or pressure differential

Max. load 15V (750 $\Omega$  at 20mA)  
Accuracy  $\leq 0.1\%$  of span

#### Logic input – for manual switching of Pump or Valve

TTL or Volt-free  
Minimum pulse 250ms

### Electrical

#### Voltage

115V  $\pm 15\%$  or 230V  $\pm 15\%$  50/60Hz (link selectable)

#### Power consumption

<10VA

#### Power interruption protection

<60ms/<3 cycles, no effect  
>60ms/>3 cycles, controlled reset

### Environmental

#### Operating limits

14° to 131°F (-10° to 55°C), 0 to 95%RH non-condensing

#### Temperature stability

<0.02% of reading or 0.5 $\mu\text{V}/^\circ\text{F}$  (1 $\mu\text{V}/^\circ\text{C}$ )

#### Housing dust/water protection

IP66 (NEMA 4X)

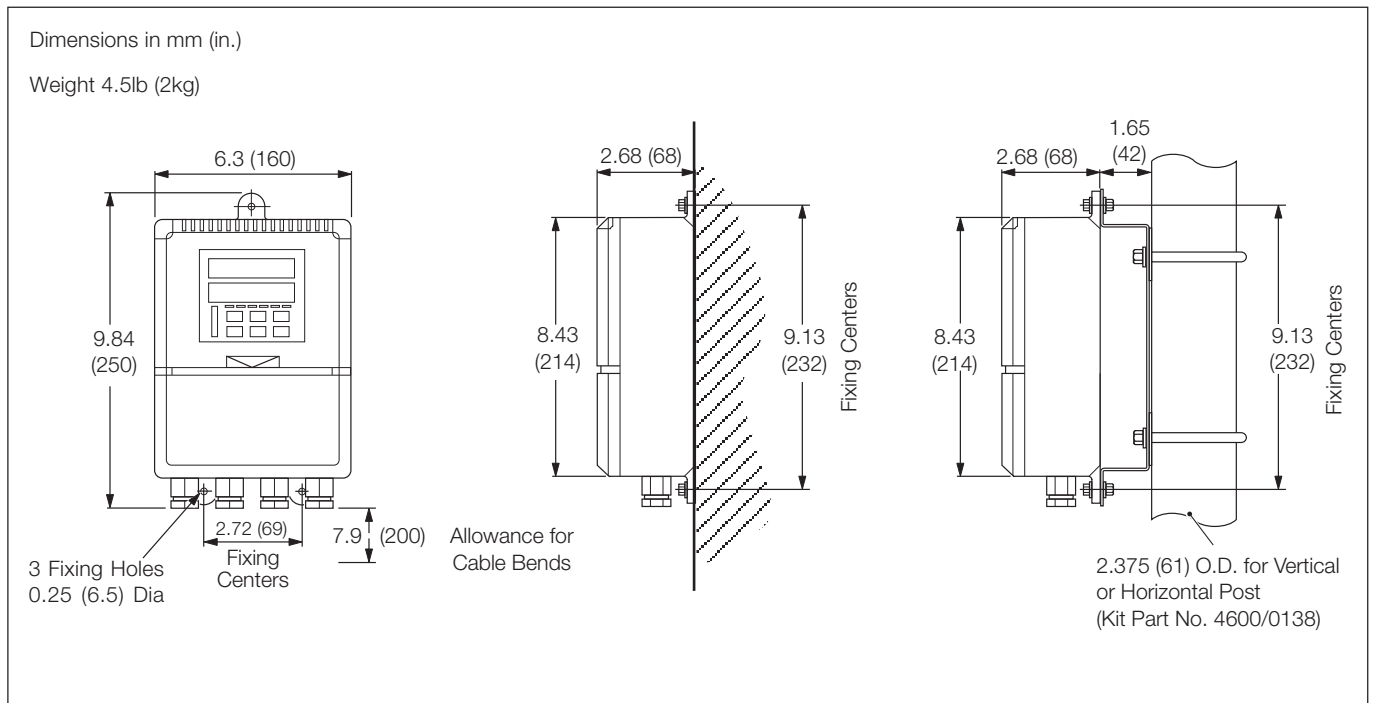
### EMC

#### Emissions and Immunity

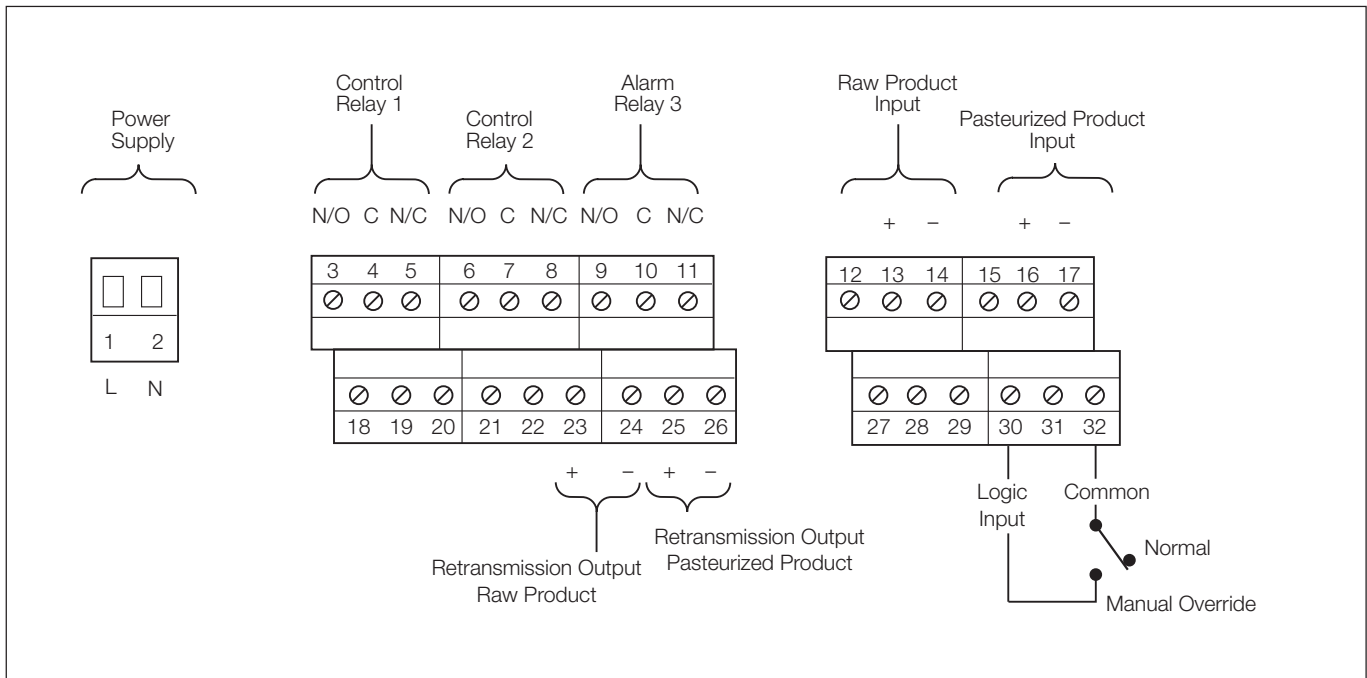
Meets requirements of IEC 61326 for an Industrial Environment  
CE marked



### Overall Dimensions – C320



**Electrical Connections – C320**



**Ordering Guide – C320**

<b>C320 Booster Pump Controller</b>	<b>C320 /</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Option Board</b>								
None		0						
<b>Power Supply</b>								
115V AC				1				
230V AC				2				
<b>Build</b>								
Standard					0			
<b>Programming/Special Features</b>								
Configured to factory standard							S	T D
Configured to customer details							C	U S



## 50T Series Transmitters

### Model 54G/A Gauge/Absolute Pressure Transmitter for Sanitary Use

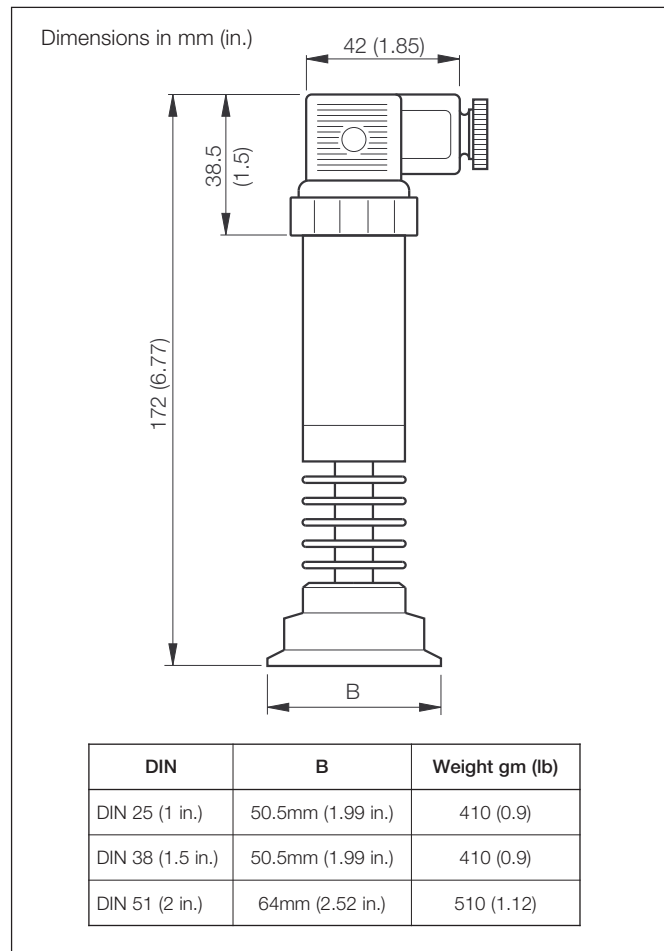
The hygienic flush diaphragm transmitters are ideally suited to fulfill the pressure measurement requirements of the food, dairy and pharmaceutical industries among others.

The cleaning requirements of the food processing industry have dictated the 'hygienic' design of these transmitters. They can also withstand without damage the various cleaning phases specific to these industries: sterilizing cycles, autoclaving and steam flushing.

Ranges:

- 100 to 4000 kPa
- 1 to 40 bar
- 14.5 to 600 psi

## Overall Dimensions and Weights – 50T





## Specification – 50T

### Range

0 to 100 psig standard  
Other ranges available

### Zero adjustment

± 15% of full scale

### Temperature limits

Ambient –25 and +85°C (–13 and +185°F)  
(can be limited by intrinsically safe application)

Process –25 and +130°C (–13 and +266°F)  
for ambient ≤ +50°C (≤ +120°F)

–25 and +180°C (–13 and +356°F)  
for ambient ≤ +30°C (≤ +86°F)

Compensated –10 and +70°C (+14 and +160°F)

Sterilizing temperature 140°C (284°F) max. for 30 minutes

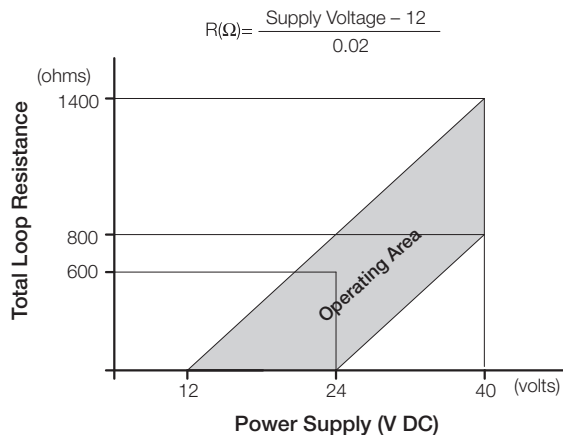
### Response time

≤ 3 ms

### Power supply

The transmitter operates from 12 up to 40V DC and is protected against reverse polarity connection (see drawing below for load limitation).

### Load limitations – total loop resistance



### Fatigue life

greater than 10 million cycles  
(pressure reversal, 20 to 80% of range; f = 1 Hz)

### Insulation resistance

> 100 MΩ @ 250V DC

### Output signal

4 to 20 mA DC

### Performance

Unless otherwise specified, errors are quoted as % of full scale

### Accuracy rating\*

≤ 0.2% of BFSL

\* Including combined effects of linearity, hysteresis and repeatability

### Ambient temperature

Per °C (1.8°F) change between the limits of –10°C to +70°C  
(+14 to +160°F)

Zero error ±0.015%  
±0.025% (for 100 kPa, 1 bar, 15 psi ranges)

Span error ±0.01%

### EMI/RFI

Meets EN50081 for emission and EN50082 for immunity

### Stability

< 0.20% over a twelve-month period

### Vibrations effect (meets IEC 68-2-6)

Total effect ± 0.1% from 10 to 2000 Hz and acceleration up to 200 m/s<sup>2</sup> (20g) in any axis

## Physical

### Process wetted parts

Flush diaphragm	AISI 316L (1.4404) stainless steel
Housing	AISI 304 (1.4301) stainless steel
Tagging	Aluminium plate fixed to housing
Filling	Filling oil codex

### Environmental protection

The transmitter is dust and sand tight  
Enclosure class IP65 (with 4 pin DIN 43650 connector)

### Process connections

Clamp ISO 2852 DN 25  
Clamp ISO 2852 DN 38  
Clamp ISO 2852 DN 51

### Electrical connections

4-pin connector ISO 4400 / DIN 43650

### Weight

From 0.410 kg to 0.810 kg

### Packing

Carton 14.5 x 6.5 x 4 cm approx. (5.5 x 2.5 x 1.6 in)



**Ordering Guide – 50T**

<b>Fixed Range Gauge Pressure Transmitter</b>	54G	XXX	X	X	X	X	X	X	X	X	X
<b>Range</b> 0 to 100 psi For other ranges refer to the 54G/A specification sheet – SS/54GA	E26										
<b>Pressure Connection</b> Clamp ISO DN 25 Clamp ISO DN 38 Clamp ISO DN 51			F G J								
<b>Code</b> Code											2
<b>Output Signal</b> 4 – 20 mA											3
<b>Electrical Certification</b> General purpose											1
<b>Electrical Connection</b> 4-pin connector ISO 4400 / DIN 43650											4
<b>Surge Protection</b> None											1
<b>Calibration Certificate</b> Not required Yes											1 2
<b>Service</b> High temperature version											4

All other parameters are preset



**Notes**