Data sheet DS/C320–EN Rev. F

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

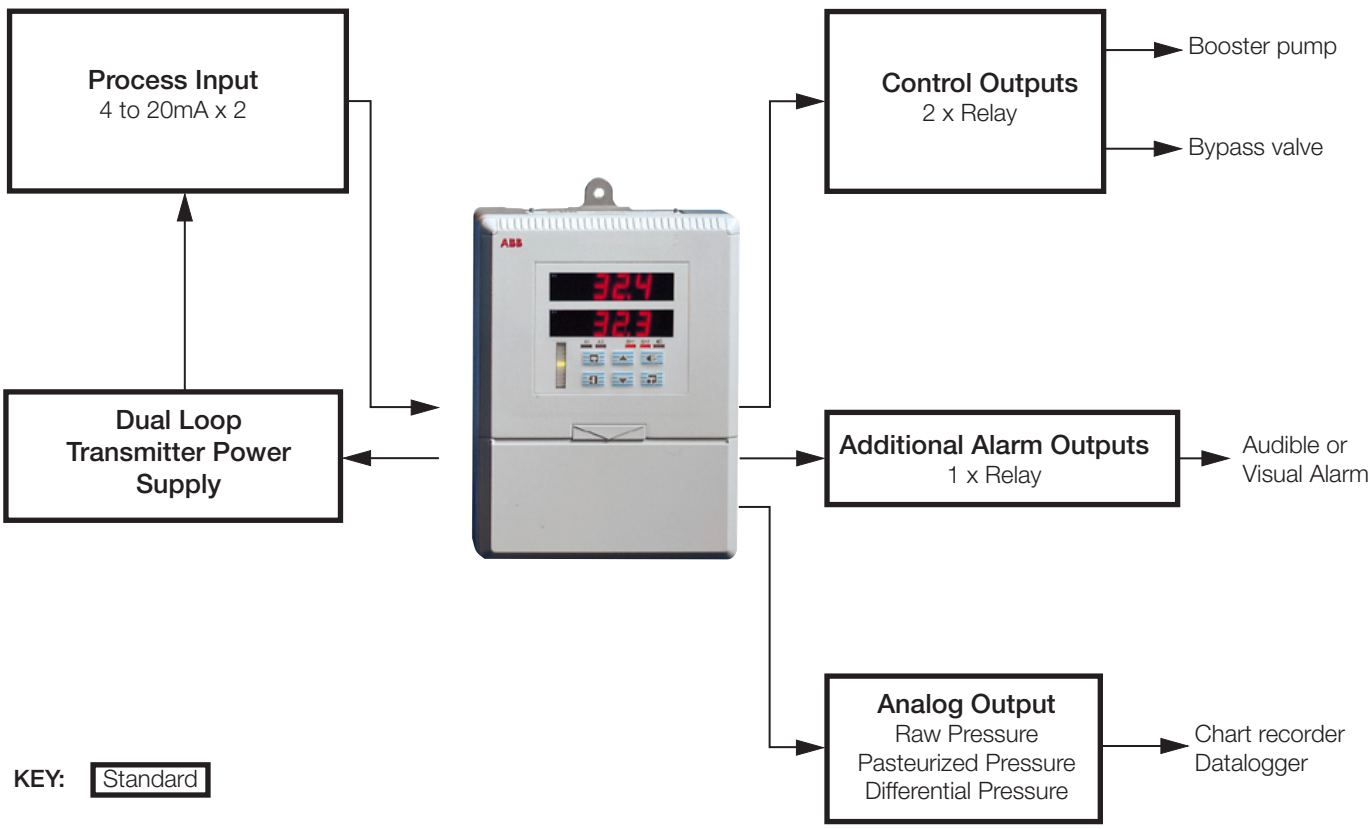
Power and productivity
for a better world™

C320

TThe 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.

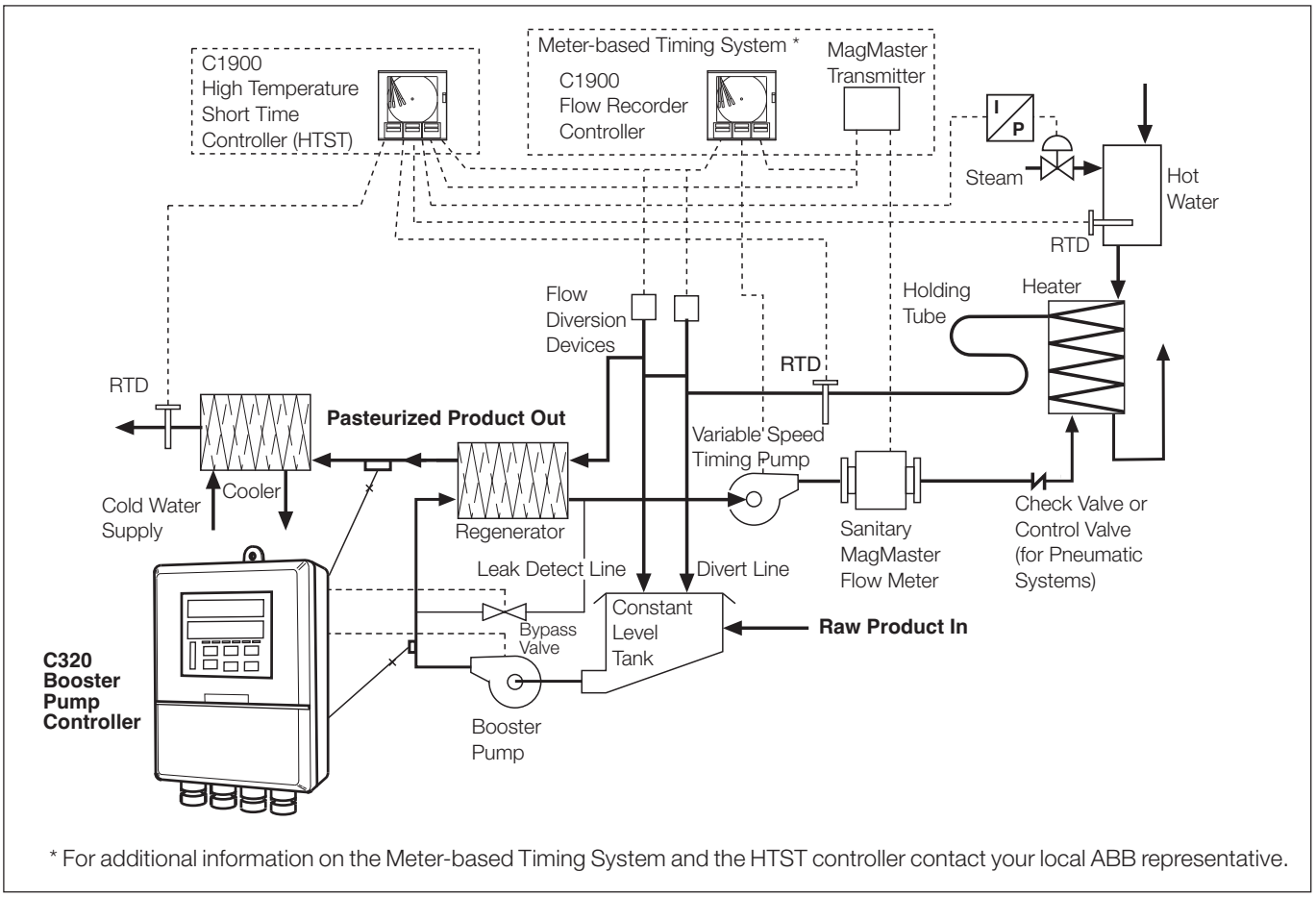


Pasteurization Pressure Control

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.



* For additional information on the Meter-based Timing System and the HTST controller contact your local ABB representative.

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

10Ω

Broken sensor protection

Programmable Up/Downscale or None

Input noise rejection

Common mode rejection	>140dB at 50/60Hz with 500Ω imbalance
Series mode rejection	>60dB at 50/60Hz

Accuracy

Measurement error	<±0.2% of reading or ±0.5μA
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 (750Ω at 20mA)
Accuracy	≤0.1% of span

Logic input – for manual switching of Pump or Valve

TTL or Volt-free

Minimum pulse 250ms

Electrical

Voltage

115V ±15% or 230V ±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 0.5μV/°F (1μV/°C)

Housing dust/water protection

IP66 (NEMA 4X)

EMC

Emissions and Immunity

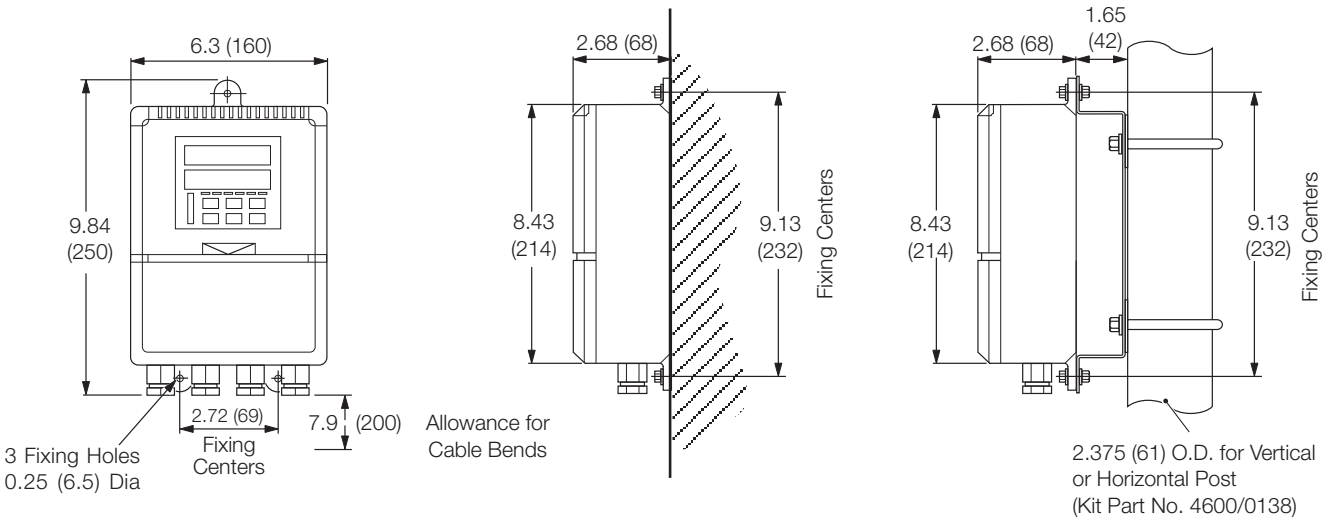
Meets requirements of IEC 61326 for an Industrial Environment

CE marked

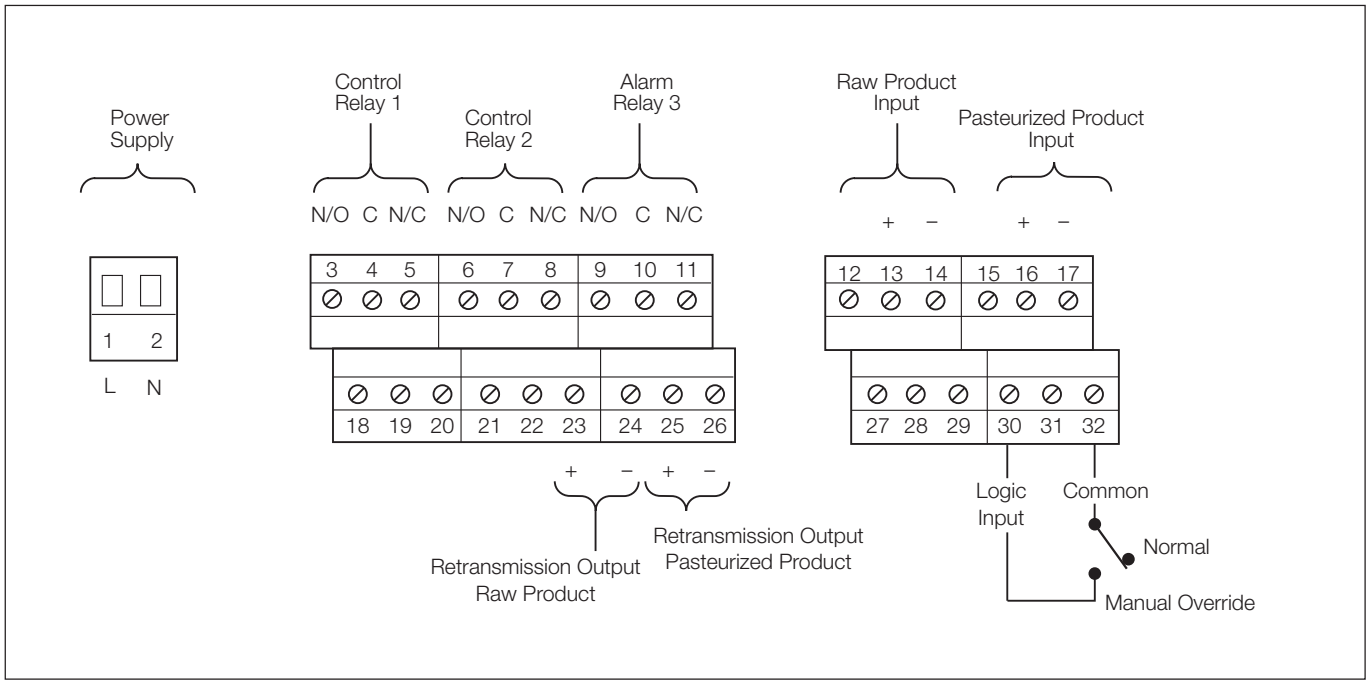
Overall Dimensions – C320

Dimensions in mm (in.)

Weight 4.5lb (2kg)



Electrical Connections – C320



Ordering Guide – C320

C320 Booster Pump Controller	C320 /	X	X	X	X	X	X	X
Option Board								
None		0						
Power Supply								
115V AC			1					
230V AC			2					
Build								
Standard				0				
Programming/Special Features								
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.

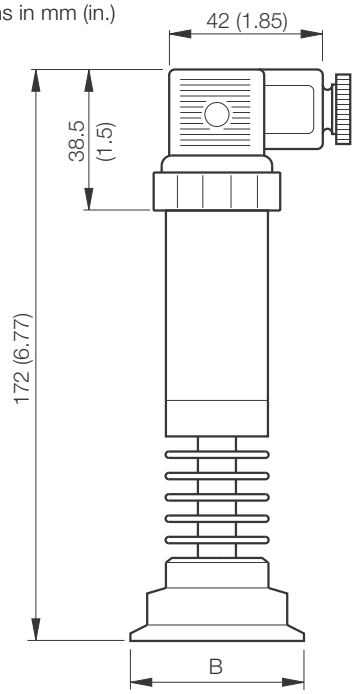
The cleaning requirements of the food processing industry have dictated the 'hygienic' design of these transmitters. They can also withstand without damage the various cleaning phases specific to these industries: sterilizing cycles, autoclaving and steam flushing.

Ranges:

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

Overall Dimensions and Weights – 50T

Dimensions in mm (in.)



DIN	B	Weight gm (lb)
DIN 25 (1 in.)	50.5mm (1.99 in.)	410 (0.9)
DIN 38 (1.5 in.)	50.5mm (1.99 in.)	410 (0.9)
DIN 51 (2 in.)	64mm (2.52 in.)	510 (1.12)

Specification – 50T

Range

0 to 100 psig standard

Other ranges available

Zero adjustment

± 15% of full scale

Temperature limits

Ambient	–25 and +85ºC (–13 and +185ºF) (can be limited by intrinsically safe application)
Process	–25 and +130ºC (–13 and +266ºF) for ambient ≤ +50ºC (≤ +120ºF)
	–25 and +180ºC (–13 and +356ºF) for ambient ≤ +30ºC (≤ +86ºF)
Compensated	–10 and +70ºC (+14 and +160ºF)
Sterilizing temperature	140ºC (284ºF) max. for 30 minutes

Response time

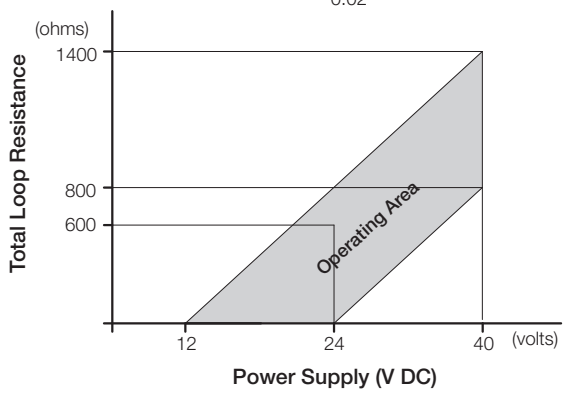
≤ 3 ms

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

$$R(\Omega) = \frac{\text{Supply Voltage} - 12}{0.02}$$



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 ºC (1.8ºF) change between the limits of –10ºC to +70ºC (+14 to +160ºF)

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^2 (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

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

All other parameters are preset

Notes

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