

Clearscan M140 Indicating Pneumatic Controller



Clearway M140 Indicating Pneumatic Controller



The Clearway M140 is a sophisticated pneumatic controller with robust mechanical sensing systems for temperature and pressure.

The M140 is available with the following control options:

On/off

Proportional (differential gap)

Proportional + Integral

Proportional + Derivative

The controller operates on the motion balance principle, i.e. motion from the pneumatic feedback unit balances the motion from the process variable measuring element (bourdon tube systems for temperature and pressure, hygroscopic element for humidity).

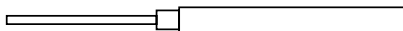
The controller can be set for use with either direct or reverse acting pneumatic valves by changing the position of the nozzle-flapper assembly and feedback unit.

The controller works from an air supply pressure of 1.4 bar (20 psi) and provides air output signal pressures between 0.2 and 1 bar (3 and 15 psi).

■ Bulb Types (for temperature instruments)

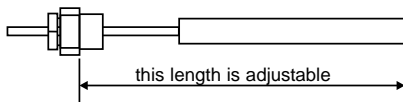
Type 301

This bulb is used when no fitting is required. The bulb may be held in place by a bracket or a clip (not supplied by Rototherm).



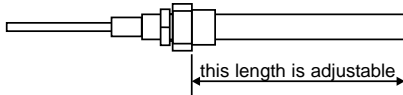
Type 302

This bulb has a fitting which slides along the capillary and is tightened into the required position. Bulb length cannot be specified.



Type 303

The fitting is located on the bulb. When ordering please confirm immersion length "L".



Receiver-Controller

The receiver-controller accepts a 0.2 to 1 bar (3 to 15 psi), input from any standard pneumatic transmitter and is available with any of the above control options.

Auto/Manual Unit - Type AM140

The optional unit enables the process regulating element (control valve) to be set automatically or manually when starting up or shutting down the process. Moreover, with this unit in circuit, the controller can be serviced without the need for the process to be shut down. It comprises an air-pressure regulator, a pressure gauge and a changeover switch and can be mounted below the controller.

■ Specifications - M140

Measuring Element

Temperature - fluid expansion, filled system

Pressure - phosphor bronze or stainless steel bourdon tube

Temperature Ranges

Any standard temperature range between -30°C and 600°C

Pressure Ranges

Any standard pressure range up to 40 bar.

Intrinsic Error of Indication

±1% of span

Ambient Temperature

-20°C to 55°C (temperature and pressure) 1°C to 40°C (RH)

Transmitter Accuracy

1% of indicated value.

Pressure Connection Size

3/8" BSP with nut and tail-piece for 8.0 mm (5/16") tubing.

Air Connection Size

For 6.4 mm (1/4") tubing, outside diameter

Air Supply Pressure

1.4 bar (20 psi)

Air Supply Effect

Not greater than 1% output change at 0.6 bar (9 psi) per 5% change in supply pressure at 1.4 bar (20 psi) at 100% proportional band.

Pointers

Red indicating, green setting

Output Gauge

0 to 2 bar (0 to 30 psi)

Output Pressure

0.2 to 1.0 bar (3 to 15 psi)

Air Consumption

Less than 3 litres/min. at 0.6 bar output (0.1 SCFM at 9 psi)

Air Output Capacity

60 litres/min. (2 SCFM) maximum.

Control Actions

Direct or reverse by simple positioning of nozzle flapper and feedback bellows.

Control Forms (Response)

On/off (approx. 1% of proportional band)

Proportional : Fully adjustable in two ranges: 1% to 50% and 4% to 200% (differential gap 5% to 100%).

Proportional + Integral : Integral action time 0.05 to 5 mins.

Proportional + Derivative : Derivative action time 0.05 to 5 mins.

Desired Value Setting (Set Point)

External knob in cover latch.

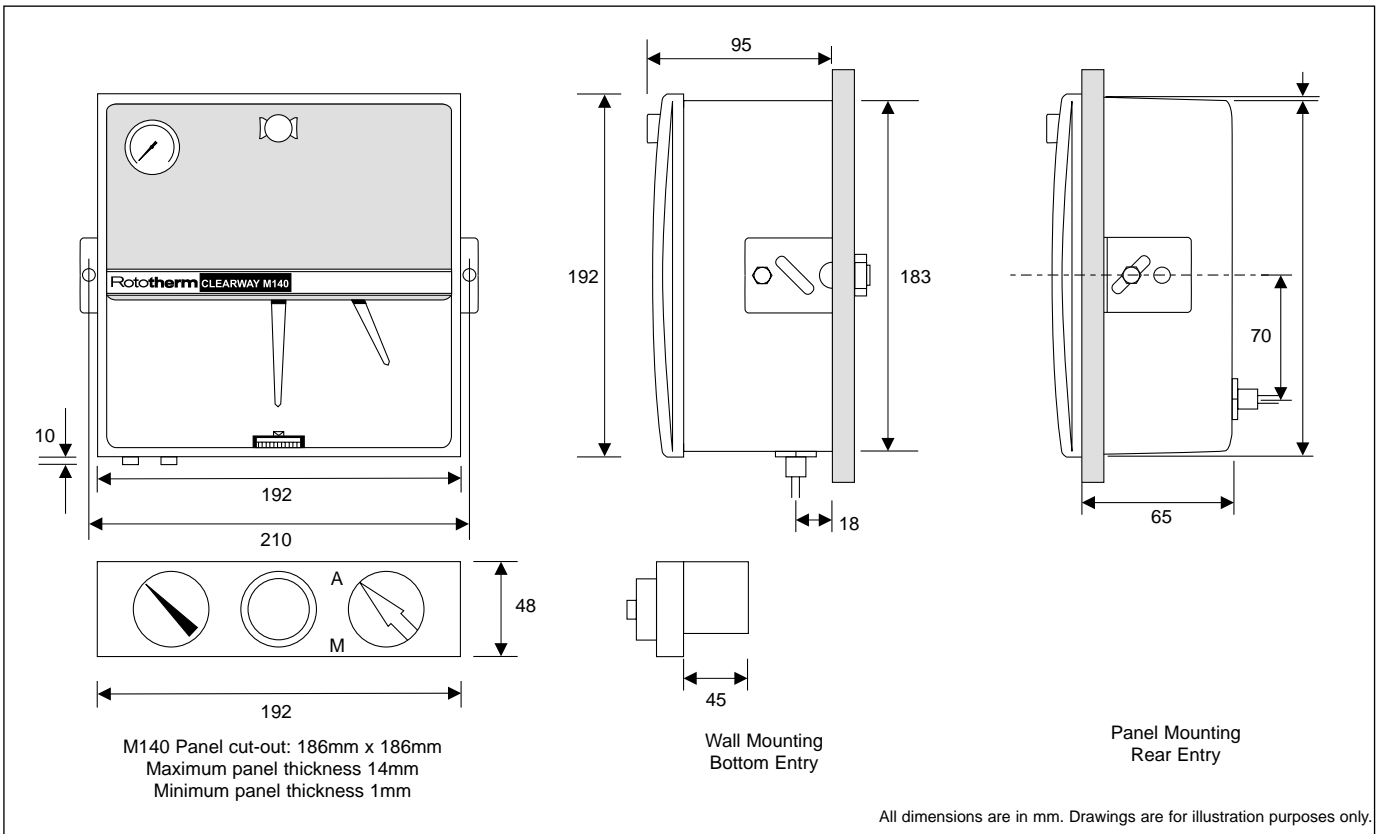
Case

Grey polyester resin-reinforced with glass fibre.

Cover

Clear acrylic - retained by external latch.

■ Dimensions



■ Models - Temperature Controllers

| Model | Control Action | Mounting |
|----------|------------------------------------|----------|
| M140-111 | On/Off | Wall |
| M140-181 | Indicating Transmitter | Wall |
| M140-121 | Proportional (or differential gap) | Wall |
| M140-131 | Proportional + Integral | Wall |
| M140-141 | Proportional + Derivative | Wall |
| M140-112 | On/Off | Panel |
| M140-182 | Indicating Transmitter | Panel |
| M140-122 | Proportional (or differential gap) | Panel |
| M140-132 | Proportional + Integral | Panel |
| M140-142 | Proportional + Derivative | Panel |

■ Models - Pressure Controllers

| Model | Control Action | Mounting |
|----------|------------------------------------|----------|
| M140-311 | On/Off | Wall |
| M140-381 | Indicating Transmitter | Wall |
| M140-321 | Proportional (or differential gap) | Wall |
| M140-331 | Proportional + Integral | Wall |
| M140-341 | Proportional + Derivative | Wall |
| M140-312 | On/Off | Panel |
| M140-382 | Indicating Transmitter | Panel |
| M140-322 | Proportional (or differential gap) | Panel |
| M140-332 | Proportional + Integral | Panel |
| M140-342 | Proportional + Derivative | Panel |

■ Standard Temperature Ranges

| Range | Range |
|--------------|--------------|
| 0 to 60°C | 40 to 200°C |
| -20 to +50°C | 0 to 200°C |
| 0 to 80°C | 50 to 250°C |
| -30 to +70°C | 0 to 250°C |
| 0 to 100°C | 0 to 300°C |
| 20 to 120°C | 100 to 400°C |
| 40 to 160°C | 0 to 400°C |
| 0 to 160°C | 0 to 500°C |
| 20 to 180°C | 100 to 600°C |
| 40 to 200°C | |

■ Standard Pressure Ranges

| Range | Range |
|---------------|-------------------|
| -1 to 1.5 bar | 0 to 8 bar |
| -1 to +3 bar | 0 to 10 bar |
| -1 to +5 bar | 0 to 12 bar |
| -1 to +9 bar | 0 to 16 bar |
| 0.2 to 1 bar | 0 to 20 bar |
| 0 to 1 bar | 0 to 25 bar |
| 0 to 1.6 bar | 0 to 30 bar |
| 0 to 2.5 bar | 0 to 40 bar |
| 0 to 4 bar | |
| 0 to 6 bar | 0 to 1 bar Vacuum |



ISO9001:2000
FM11958

British Rototherm Company Limited

Kenfig Industrial Estate, Margam, Port Talbot SA13 2PW, United Kingdom

Telephone: +44 (0) 1656 740 551 Facsimile: +44 (0) 1656 745 915

E-mail: sales@rototherm.co.uk Web site: www.rototherm.co.uk

Rototherm
instrumentation and control

This literature is for guidance only. It does not constitute recommendations, representations or advice, nor is it part of any contract.

In keeping with British Rototherm's policy for continual product development and improvement, we reserve the right to amend specifications without notice.

© 2005 British Rototherm Co. Ltd. All rights reserved.