

C105 & M105 Clearscan Temperature Recorders & Recorder Controllers

C/M105T-2003



C105 Clearscan Recorder



M105 Clearscan Recorder

Choice of Cases

The Rototherm temperature recorders can be built into either of two types of tough steel case. Both have a lockable front-hinged door, permitting easy access to the chart and pens, and may either wall or panel mounted. C105's can be supplied complete with a portable stand.

The Clearscan M105 has a rectangular steel case, an aluminium door and triplex glass. Electrical and pneumatic, controller versions are available.

The C105 temperature recorder has a tough circular steel case which, as with all other C105 mechanical recorders, is suitable for installing under severe industrial conditions. The door has a strong polycarbonate window. Versions incorporating electronic control are available.

Pens

The recorders utilise sealed ink capsules with built-in fibre-tipped pens which are replaced simply and without mess. Single pen recorders and the first pen of two pen recorders trace in red ink; the second pen of two pen recorders traces in green ink.

Charts and chart drives

The standard chart durations are one revolution every 12 hours, 24 hours or 7 days, the chart drive being either an electrical or a mechanical (clockwork) motor. Alternatively a 24 hour or a 7 day electrical chart drive with its own built-in, recharging reserve power unit, can be selected. The version gives a continuing trace through a mains failure. When running "normally" in the fully charged condition the power unit accumulator holds enough capacity to drive continuously for five days.

Ranges

The minimum temperature reading is normally located at the centre of the recorder chart. For best recording select a range in which the normal working temperatures are between 50 and 80 per cent of the instrument span.

Electrical Control/Alarm

Rototherm Clearscan M105 and C105 recorders can be supplied with up to four independently adjustable single on/off alarm/control channels, each provided with a setting pointer adjustable over the full chart range to indicate the set value against the chart. The pointers are fitted with a lockable device to prevent accidental disturbance.

Switching Capacities and Relays

The control contacts themselves have a switching capacity of 20mA inductive or 30mA non-inductive load, and can be used to switch directly low loads such as alarm lamps. For longer contact life, and where higher loads are to be switched relays with spark suppression and delayed action circuits are fitted, thereby avoiding arcing and switch point oscillation whilst up-rating the switching capacity to 5A, 240V a.c. non-inductive. Higher rated relays are available on request.

Optional Features

Clearscan M105 recorder/controllers with contacts and relays can have indicator lights visible through the door. There is a version offering both visual and audible alarms including a muting switch for more critical operations.

Pneumatic Control

Pneumatic control can be fitted to most recorders in the Clearscan M105 case. Providing a 0.2 to 1 bar (3 to 15 Psi) output signal for direct connection to control valves or other pneumatically driven regulators.

The pneumatic system operates on the motion balance principle, i.e. motion from the pneumatic feedback unit balances the motion from the pressure system. Control action occurs at or about the value set by the setting pointer. The pointer is adjustable over the full chart range and is fitted with a locking device to prevent accidental disturbance. Gauges displaying the supply and output pressures, and the control, setting pointers, are clearly visible through the door of the recorder.

Pneumatic Control Options

The following options are available - Proportional only (P), Proportional + Integral (P + I), Proportional and Derivative (P + D) and Proportional + Integral + Derivative (P + I + D). Advice on the best control option for a particular application will be given by our application engineering staff.

The instrument can be set to give either a reverse or direct acting output; reverse and direct action versions respectively provide a decreasing or increasing controller output pressure with a process pressure rise.

Only one channel of pneumatic control would normally be fitted to single pen recorders and to the first pen of two pen recorders. Instruments with two channels of pneumatic control, and combinations of pneumatic and electrical control, may be available to special order.

Specifications

Accuracy

±1% FSD

Chart Drive

Synchronous electric or mechanical spring wound.
12 hour, 24 hour or 7 day rotation - other rotations on request.

Charts

255 mm diameter

Inking System

Disposable fibre tipped pen.
Single pen : Red
2 pen : Red and green

Case

C105: Steel body with foam moulded door and glass window.
Polycarbonate doors are fitted as standard to recorders with pressure ranges above 60 Bar
M105: Steel body with aluminium and Triplex toughened glass door (polycarbonate glazing available as an option)

Power Supply

200 to 250 volts, 50Hz (60Hz available)
100 to 120 volts, 50Hz (60Hz available)
Instruments without electrical control require no power supply provided that a mechanical spring wound chart drive is fitted.

Electrical Alarm & Control

Contacts

20mA at 30V ac 50Hz (inductive load):
30mA at 30V ac 50Hz (non-inductive load)

Pneumatic Control

Air Supply Pressure

1.4 bar (20 Psi)

Air Supply Pressure effect

No 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.

Output Pressure

0.2 to 1.0 Bar (3 to 15 Psi)

Air Connection Size

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

Supply & Output Gauges

0 to 2 Bar (0 to 30 Psi)

Air Consumption

Less than 3 litres/min at 0.6 bar output

Air Output Capacity

60 litres/min

Control Actions

Direct or reverse by simple positioning of nozzle/flapper

Mounting

Suitable for wall or panel mounting.
Portable option available (C105 only)
Instrument must be mounted vertically for accurate results.

Weight (approx.)

C105: 8.5 kg

M105: 14.0 kg

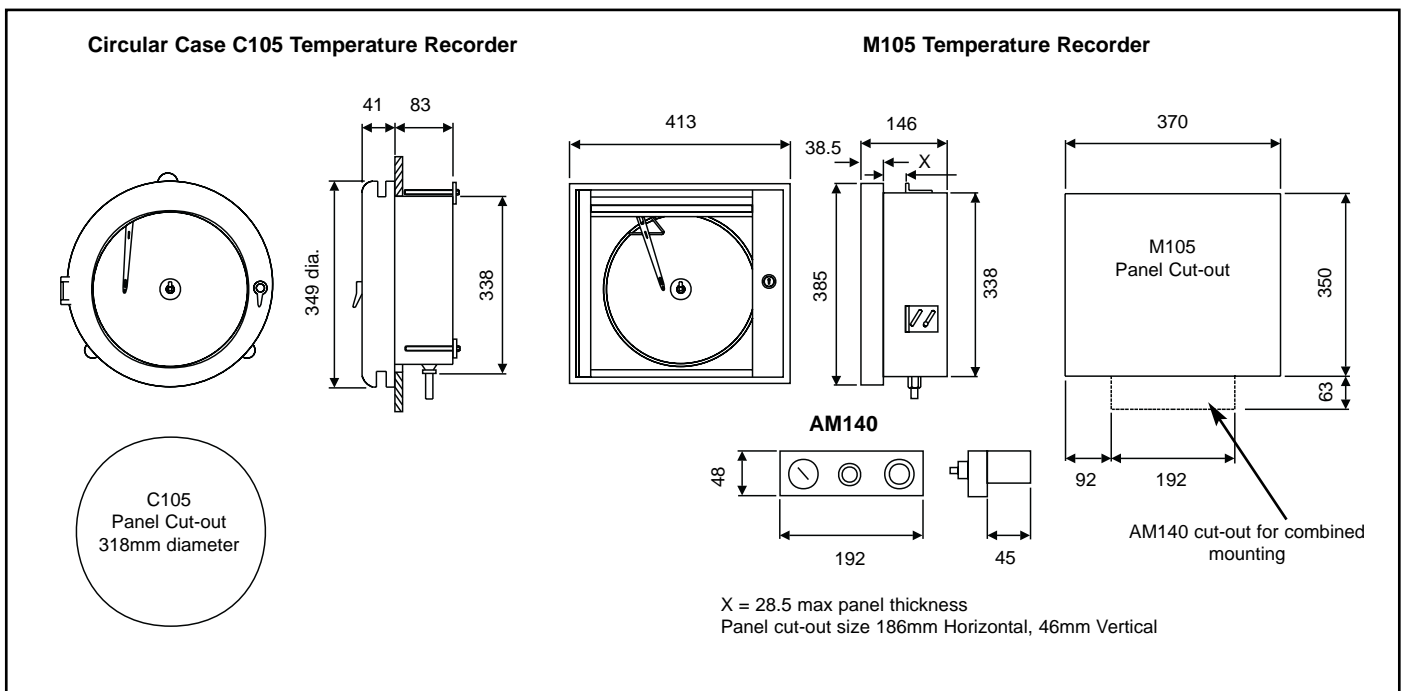
Approximate weight for recorder with 3 metres of capillary.

Standard Temperature Ranges

Range	System Filling	Range	System Filling
-40 to +40°C	f	0 to 160°C	f
-30 to +30°C	f, m	0 to 200°C	f, m
-30 to +50°C	f, m	0 to 300°C	f, m
-25 to +25°C	f, m	0 to 400°C	f, m
-25 to +30°C	f, m	20 to 120°C	f, m
0 to 40°C	f, m	50 to 150°C	f, m
0 to 50°C	f, m	50 to 250°C	f, m
0 to 60°C	f, m	100 to 400°C	f, m
0 to 100°C	f, m	100 to 500°C	f, m
0 to 120°C	f, m		

key f = non toxic fls safe m = mercury

Dimensions & Fixings



All dimensions are in mm. Drawings are for illustration purposes only.

Ordering Codes

1 pen	C105A																			
	M105A																			
2 pen	C105B																			
	M105B																			

MOUNTING

Wall/Panel
 Portable (C105 only)

CHART DRIVE

Electric 240V 50Hz
 Electric 110V 50Hz
 Electric other*

Spring Wound

CHART ROTATION

24 hour
 7 day
 Other*

CONTROLS / ALARMS

No control
 1st pen, High/Low or High & Low
 2nd pen, High/Low or High & Low

BULB OPTION

Type 301
 Type 302
 Type 303
 Other*

CAPILLARY

Stainless steel
 Copper
 Flexible stainless armour
 Flexible stainless armour over stainless
 Other*

CAPILLARY LENGTH

3 metres is standard -
 if different enter length in metres

FITTING/GLAND

No fitting
 Gland 1/2" BSP
 Other*

IMMERSION LENGTH "L"

(length in mm)

TEMPERATURE RANGE

(Specify °C or °F)

1 pen	M105A																			
	M105B																			

MOUNTING

Wall/Panel

CHART DRIVE

Electric 240V 50Hz
 Electric 110V 50Hz
 Electric other*
 Spring Wound

CHART ROTATION

24 hour
 7 day
 Other*

CONTROLS / ALARMS

No control
 1st pen, High/Low or High & Low
 2nd pen, High/Low or High & Low

BULB OPTION

Type 301
 Type 302
 Type 303
 Other*

CAPILLARY

Stainless steel
 Copper
 Flexible stainless armour
 Flexible stainless armour over stainless
 Other*

CAPILLARY LENGTH

3 metres is standard -
 if different enter length in metres

FITTING/GLAND

No fitting
 Gland 1/2" BSP
 Other*

IMMERSION LENGTH "L"

(length in mm)

TEMPERATURE RANGE

(Specify °C or °F)

SINGLE PEN CONTROL

Proportional only
 Proportional + Integral
 Proportional + Derivative
 Proportional + Integral + Derivative
 On/Off
 Differential Gap

ACTION

Direct
 Reverse

TWO PEN CONTROL

Proportional only/Direct Action
 Proportional only/Reverse Action
 No control on 2nd pen (if fitted)

AM PANELS

AM Panel Required
 AM Panel Not Required

AIR FILTER REGULATOR

Air Filter Regulator Required
 Air Filter Regulator Not Required

Notes:

- a) When other is specified please add note to order code stating exact requirement.
- b) When specifying different ranges for 2 pen recorders, care should be taken to use compatible chart ranges. Details are available on request.
- c) Pneumatic Control is only available on M105 type cases.

Example Ordering Code

C105A / 1 / A / 1 / A / 3 / C1 / 3 / B / 250 / 0-100°C

Single pen temperature recorder, C105 case, wall mounted, electrical 240V 50Hz chart drive, 24 hour rotation, 3 metres of C1 stainless steel capillary, type 303 bulb with a 1/2" BSP fitting, 250 mm immersion length, temperature range 0 to 100°C.

FOR INSTRUMENTS FITTED WITH PNEUMATIC CONTROL ONLY

Auto-Manual Unit Type AM140

This optional unit enables the process regulating device (e.g. control valve) to be controlled automatically or manually. With this unit in the control circuit, process start-up and servicing can be carried out simply and efficiently. The AM140 comprises an air pressure regulator, a pressure gauge and changeover switch; and can be mounted below the Clearscan M105.

Air Filter Regulator

An air filter regulator complete with pressure gauge is available for fitting into the air supply line to the recorder.

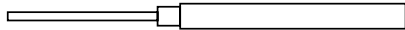
Pneumatic Control Options

Control Option	Proportional Band	Integral Timer	Derivative Time
On/Off	Approx. 1% fixed	-	-
Proportional	1-50% and 4-200%	-	-
Proportional + Integral	1-50% and 4-200%	0.05 to 5 mins.	-
Proportional + Derivative	1-50% and 4-200%	-	0.05 to 5 mins.
Proportional + Integral + Derivative	1-50% and 4-200%	0.05 to 5 mins.	0.05 to 5 mins.

Bulb Types

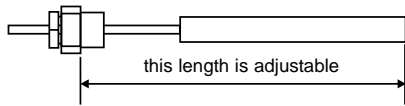
Type 301

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).



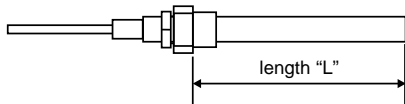
Type 302

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".



World-Wide Reliability & Quality

Rototherm's high quality and performance is guaranteed by an uncompromising approach to quality. British Rototherm's policy has always been to maintain a consistently high level of quality and reliability throughout its product range and service to customers. The company has worked energetically towards establishing comprehensive quality controls and has earned a world-wide reputation for product quality.



ISO 9001

Other Recorders & Controllers Available include:

- **Temperature & Pressure Combined**
- **Temperature & Humidity**
- **Pressure & Differential Pressure**
- **Flow**
- **Level**
- **Electric Input Recorders - including programmable recorders**
- **Pneumatic Recorder Controllers**

Telephone: +44 (0) 1656.740.551
Facsimile: +44 (0) 1656.745.915

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



British Rototherm Company Limited, Kenfig Industrial Estate, Margam, Port Talbot, West Glamorgan SA13 2PW United Kingdom

This literature is for general guidance only. It does not constitute recommendations, representations or advice, nor is it part of any contract. © British Rototherm Co. Ltd. 2003
In keeping with British Rototherm's policy of continued product development and improvement, we reserve the right to amend specifications without notice. E&OE.