



Pellet Dispenser for 14, 20, 45 and
190 mg pellets

80209A

Contents

01	Introduction.....	3
02	Packaging.....	4
03	Installation.....	5
04	Operation.....	6
4.1.	Operation without drop detector.....	6
4.2.	Operation with drop detector.....	6
4.3.	ABET example feed protocol.....	6
4.4.	Different Pellet Sizes.....	7
05	Helpful Tips for Reliable Operation.....	8
05	Maintenance.....	9
05	Specifications.....	11
06	Spare Parts and Accessories.....	12
07	Dimensions (in mm).....	13
08	EC Declaration of Conformity.....	15

© Campden Instruments Limited. 2008-2022, APRIL 2022. DCN 4800. Document Ref:80209A ENG v.1.1.

All rights reserved. The information contained in this manual is the property and copyright of Campden Instruments Limited. No part of this manual may be reproduced in any form or by any means (including photocopying or storing in any medium by electronic means) without the written permission of the copyright holder.

The purpose of this manual is to allow the user to achieve expertise in the use of the Instrument and to give the maintenance technician an insight into maintaining the instrument in peak operating condition.

Please read and understand the information contained in this manual before using the instrument. Only competent and capable personnel should use the instrument.

This document should be retained for future reference as it contains the name and address of the manufacturer within the EC

NOTE: The equipment rating label is positioned near the cable inlet.

01 Introduction

The Campden Instruments 80209A Pellet Dispenser is a standard accessory for the Campden range of TouchScreen, 5-9 hole, and Modular test chambers. The dispenser has been designed and extensively tested for use with most popular brands and sizes of food pellets. The dispenser can be supplied with either a 14mg, 20mg, 45mg or 190mg pellet disks. All disks are interchangeable. A range of reward trays suitable for pellet delivery are available for both standard operant and Bussey Saksida touch chambers. Depending on the application requirement, a selection of feeder mounting brackets is also available. Please see product numbers at the rear of the manual for feeder options.

The pellet feeder is extremely reliable however to improve feed accuracy, a Pellet Drop Detector is available as an optional accessory. The detector connects to the outlet of the dispenser and provides additional reassurance that a pellet has been released to the reward area. With the detector attached, in the event of a mis-feed, the feeder will automatically repeat the pellet release cycle until a pellet release has been detected. The Pellet Dispenser when used with the Pellet Detector will also report a pellet jam or an empty pellet reservoir to the experiment control system. The Pellet Detector simply attaches to the dispenser outlet tube and connects to the dispenser via a 4 way connector. The Pellet Detector is supplied in three versions for: 14 and 20mg, 45mg and for 190mg. The Pellet Detectors are interchangeable but must be used in conjunction with the correct pellet wheel. The 190mg dispenser pellet guide accommodates the thicker pellet wheel.

Reward Area delivery troughs is covered under separate documentation.

02 Packaging

Please retain the original packaging for future use.

Instruments will not be accepted for service or repair unless the unit has been adequately and properly packaged. Additionally, instruments will not be accepted without prior authorisation and have been certified as being uncontaminated with any material that may be hazardous to the health of service personnel. A Returns Authorisation and Decontamination Certificate blank form is included at the end of this manual and may be photocopied as required. Blank forms can also be obtained by contacting Campden Instruments.

Packing List

Item	Quantity
Pellet feeder is supplied with:	
Feeder Lid	1
Feeder Cable	1
Delivery Tube	1
Cleaning Brush	1
Instruction Manual	1
Index Wheel Holding Bar	1
Drop detector is supplied with:	
Cleaning Brush	1

03 Installation

The feeder should be positioned above the feed / reward tray and such that the flexible delivery tube can be guided into the feed tray pellet inlet without kinking. The tubing may require cutting to achieve the required length.

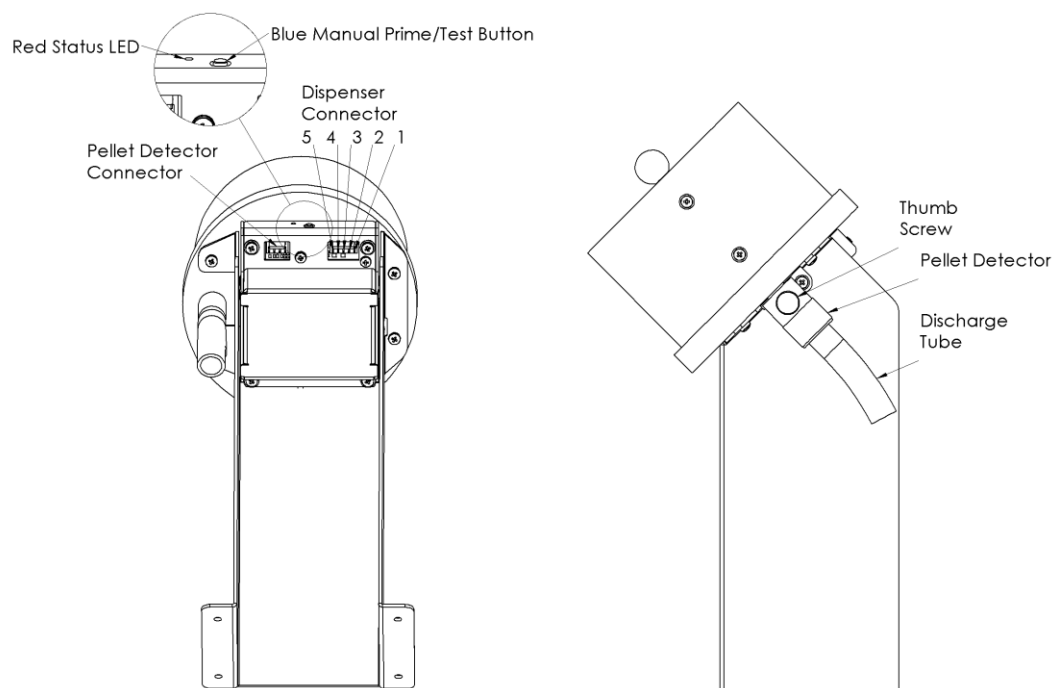
For the reliable operation of the Pellet Dispenser the cylindrical axis Reservoir Bowl should be inclined at 45° to the horizontal plane and orientated so that the pellet discharge hole is at the 3 o'clock position when viewed facing the Reservoir Lid. These positional requirements are maintained when using the correct mounting brackets. Part numbers for fitting to different apparatus are listed at the rear of the manual.

Connections to the dispenser are made via a 5 way plug and cable (supplied), see illustration below.

Connections are as follows:

1. Status, active high (Low = 0V, High + 5V). Swap Yellow from pin 4 if required
2. Status, active low (Low = 0V, High = Supply). Yellow
3. Operate (connect to 0V to operate). Blue
4. 0V. Green
5. Supply 12 - 28 VDC. Red

If the Pellet Detector is used, it should be plugged into the 4 pin polarised connector on the dispenser body and be fitted to the dispenser outlet tube (see illustrations below). The detector should be secured to the dispenser outlet with the single thumbscrew. Note that for correct alignment of the detector, the thumbscrew axis should be horizontal as shown.



80209A with Stand (80209A-S1)

80209A with Stand (80209A-S1) and Pellet Detector

04 Operation

There is a prime / test button located near the cable inlet (see fig above). Pressing the button will start a feed cycle.

Operating the pellet feeder requires the operate terminal to be 0v for >50mS. Release and reapply for the next dispense operation. The feeder will not accept a new operate signal until the previous delivery is complete.

4.1. Operation without drop detector

To establish if a pellet delivery is complete:

1. Wait for 800ms
2. Monitor the status output line. The status output will go Active (low) whilst the dispenser is operating. Returning high indicates that the dispenser is ready to feed again.

If after a feed cycle, the status line remains active then the feeder has jammed and is not correctly indexing, a red LED on the dispenser base will illuminate. The feeder components will require investigation before proceeding. Tasks can be programmed to end the experiment if a feed error is reported (see ABET example feed protocol).

Note: The Feed status line will reset after the following operate cycle completes.

4.2. Operation with drop detector

To establish if a pellet delivery is complete, monitor the status output line. The status output will go Active (low) whilst the dispenser is operating. The status line will stay active (low) until a pellet has been feed, returning high indicates that the dispenser is ready to feed again. If there is a missed feed the unit will automatically try and refeed up to 10 times, the status line will stay active for the entire cycle.

If after a feed cycle, the status line remains active then there has been an error, either the feeder has jammed and is not correctly indexing, or the pellet bowl is empty. A red LED on the dispenser base will illuminate. The feeder components will require investigation before proceeding. Tasks can be programmed to end the experiment task if a feed error is reported (see ABET example feed protocol).

The pellet drop detector requires occasional cleaning. If the detector is overly dusty, the red LED on the dispenser base will flash rapidly. The dispenser will operate in the non-drop detector mode until the drop detector has been cleaned. Please refer to the maintenance section for cleaning details. Note: refresh the power supply to the pellet feeder after cleaning to clear the error.

4.3. ABET example feed protocol

To control the feed cycle and error in ABET software, the following protocol should be used. The code will work with or without drop detector. Note, the variable `timeout` \geq 7sec

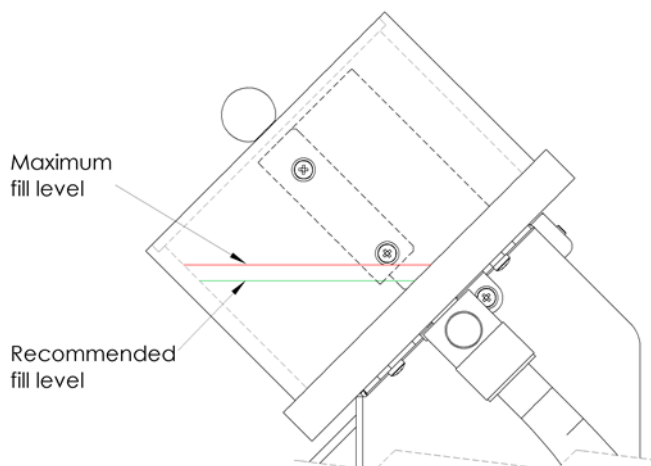
1. If **Condition is met** then send a 50ms **Feeder#1** pulse (Request a feed operation if feeder is not in use). Start **Feed_error** timer. (Start a timer which will signal a fault if the feeder status line does not reset after a set time).
2. If **FeederStatus#1** is **active** then goto 3. (Wait for the feed operation to start).
Else If **Feed_error** timer **timeout** then goto 5 (if it takes too long for the Feeder status line to respond then there is a fault).
3. If **FeederStatus#1** is **not active** then goto 4. (Wait for the feed operation to complete)
Else If **Feed_error** timer **timeout** then goto 5. (if it takes too long for the Feeder status line to respond then there is a fault).
4. Continue with schedule (feed successful).
5. End schedule (feed error).

4.4. Different Pellet Sizes

It is possible to feed 14, 20, 45 and 190mg pellets with the feeder. A different pellet index wheel and drop detector (if required) is needed for each pellet size. It is advisable to order the feeder specifically for the pellet size you wish to use. If however you wish to change to a different pellet size, pellet specific wheels and detectors are available. Refer to the section on Removal and refitting of the pellet wheel.

05 Helpful Tips for Reliable Operation

1. See the pellet manufacturer's instructions. Typically, this will be to store pellets in a cool, dry location in a sealed container together with any desiccant provided by the manufacturer.
2. Keep the pellet dispenser in a low humidity area to prevent pellet dust sticking to the mechanism and interfering with dispensing.
3. Keep the lid on the pellet dispenser hopper to keep pellets as fresh as possible.
4. Never overfill the hopper – see diagram. If the hopper is overfilled excessive dust will be created, there will be an increased risk of multiple pellets being fed, pellet jams, etc. Avoid the use or inclusion of broken pellets to minimise the amount of dust in the mechanism.



Recommended pellet load:

14mg – 4000
20mg – 4000
45mg – 2000
190mg - 800

5. Due to the action of the index wheel selecting pellets, dust will be created. Certain pellets will create more dust than others. Some of this dust will accumulate under the index wheel. A small stiff brush is supplied with each feeder. This should be used regularly to remove any dust build up. When the feeder is empty, switch off the power supply. Place the brush tip into one of the pellet recesses in the pellet wheel and use the brush to rotate the wheel thus sweeping any accumulated dust through the pellet discharge hole. If using a Pellet Detector this should also be cleaned after cleaning dust from the bowl.
6. NEVER clean the unit with liquid soap or any solvents. Doing so can damage the control electronics, leave residues that may cause pellet dust to accumulate or even melt the plastic components.
7. Use pellets from a reputable supplier. We recommend:

TestDiet® Division of LabDiet®, a Purina Mills, LLC company
505 North 4th
Richmond, IN 47374 USA
(317) 966 1885

www.testdiet.com

Note: TestDiet now provides all the original formulations developed by P J Noyes and sold for a time by Research Diets

BioServ
One 8th Street, Suite 1
Frenchtown, NJ 08825 USA
(908) 996 2155

www.bio-serve.com

05 Maintenance

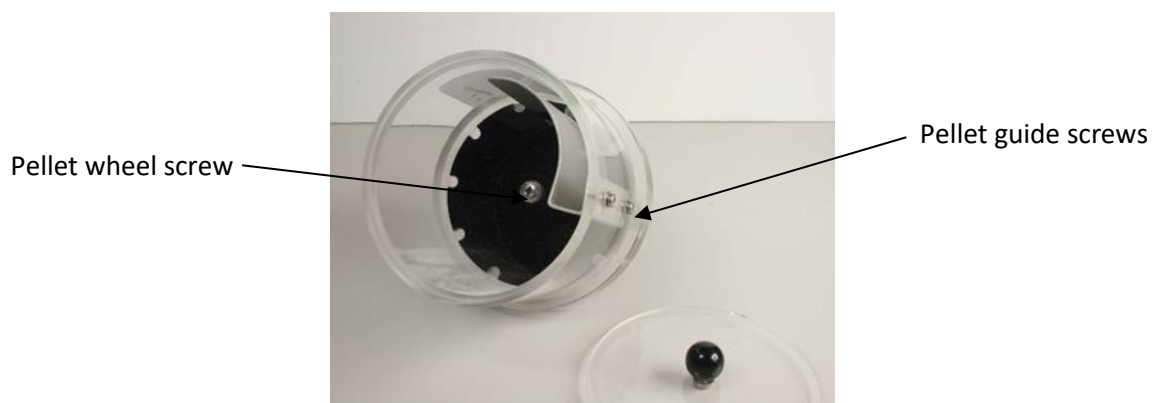
All electrical instruments and equipment should be periodically tested to ensure that they remain safe to use. In some countries this may be a statutory requirement. Your local Health and Safety Executive (or equivalent) will be able to advise on this matter.

The units contain no user-serviceable parts. Contact your dealer or Campden Instruments (techsupport@campdeninstruments.com) if you require assistance.

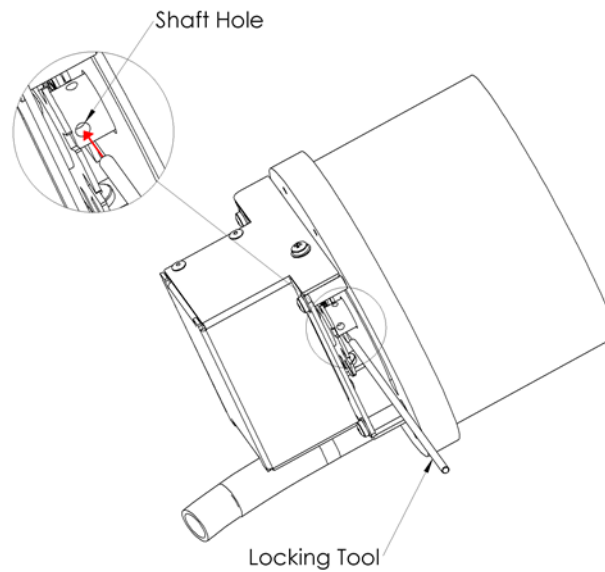
Beyond regular dust removal with a small brush as described in the previous section, occasionally, the build-up of dust with moisture from the air will leave a residue which requires a more thorough clean. If this dust is not removed, it will impair the effectiveness of the dispenser eventually accumulating to the point where the dispenser will stall. It is not possible to give guidance on the frequency of this aspect of maintenance, because of variation in pellets. The recommended procedure for dismantling and cleaning the pellet dispenser is described in the section - Removal and refitting of the pellet wheel.

Removal and Refitting of the Pellet Wheel. (For cleaning or wheel exchange)

1. Empty pellets from dispenser and disconnect from the electricity supply before commencing.
2. Remove the feeder from its operational location and setup to work on a clean dry desk. A pozi-drive screwdriver, alignment tool, anti-static spray (e.g. Electrolube ASA), air duster aerosol and cleaning brushes are required.
3. Remove the pellet drop detector if fitted.
4. Remove the two screws (in the side of the bowl) that secure the curved pellet guide. Remove the guide from the bowl.



5. Loosen and remove the central screw securing the pellet wheel (hint: use a small screwdriver positioned through one of the pellet wheel recesses into the discharge outlet to prevent the wheel turning as the securing screw is loosened). Remove the pellet wheel (if the pellet wheel is tight on the central spigot, carefully push it upwards with a small screwdriver through the discharge hole).
6. Ensure the components are clean and free from dust. Use soft cloth/small brush or tissue. Blow away any remaining dust using an air duster (aerosol duster).
7. It is recommended that the components are coated with an antistatic spray prior to reassembly. This greatly reduced the amount of dust build up on the feeder components. Spray the bowl and pellet wheel with anti-static spray. Wipe away any excess and ensure bowl is dry before reassembly.
8. To reassemble, position the wheel on the spigot and fit the retaining screw, tighten slightly. Operate the dispenser once or twice and check the position of the pellet recesses in the wheel relative to the discharge hole. Realign the wheel as required such that the recesses align with the discharge hole at each index and tighten the securing screw. Recheck the index alignment. To prevent the motor shaft spinning when tightening the pellet wheel, insert the lock tool into the shaft hole as shown.



9. Refit the pellet guide into the bowl – do not over-tighten the securing screws. The pellet guide should not be in contact with the wheel, nor should it too far away that pellets can get trapped in the gap.
10. Clean and refit the pellet detector. See Section - Pellet Drop Detector.
11. Run a trial batch of pellets to ensure reliable feeding.

Pellet Drop Detector

The pellet detector operates on an IR light beam principle, all pellets create dust that will settle on the IR emitter and detector eventually impairing the pellet detector effectiveness. The red LED on the pellet feeder will flash rapidly if the pellet detector requires cleaning. Remove the detector from the feeder body and use the tubular brush (supplied), to thoroughly clean any dust from the full length of the bore. When replacing the detector, note that thumbscrew axis should be horizontal as shown. Refresh the power supply to the pellet feeder after cleaning to clear the error.

05 Specifications

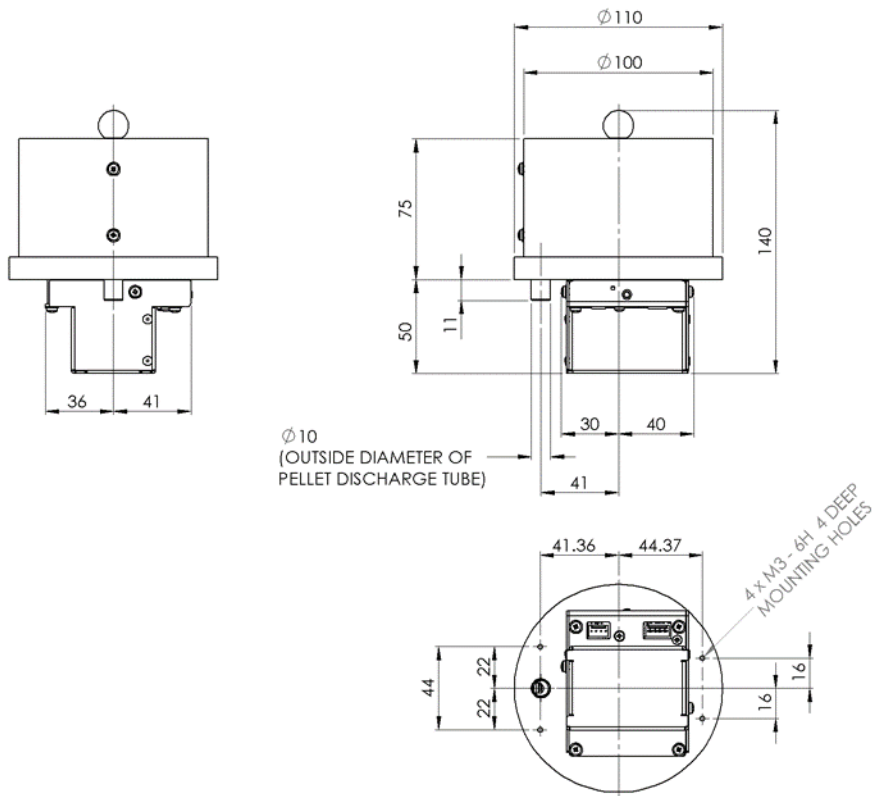
Voltage requirements	12 – 28 VDC
Operating current	<250mA
Standby current	<20mA
Operate Signal	Active Low, >5 to 28VDC max = High
Status Signal	Active Low, Low = 0VDC, High = Supply voltage Active High, Low = 0VDC, High = 5VDC
Feed rate	600ms between pellets. (Tested with 45mg and 190mg pellets without drop detector fitted)
Maximum bowl capacity	190mg pellets: 800 45mg pellets: 2000 20mg pellets: 4000 14mg pellets: 4000
Reliability	98% correct feed count without drop detector 99.99% correct feed count with drop detector (Based on a sample run of 10000 pellets. Assuming unit is clean, correctly maintained, and good quality dry pellets are being used)

06 Spare Parts and Accessories

When ordering, please order by part number and description.

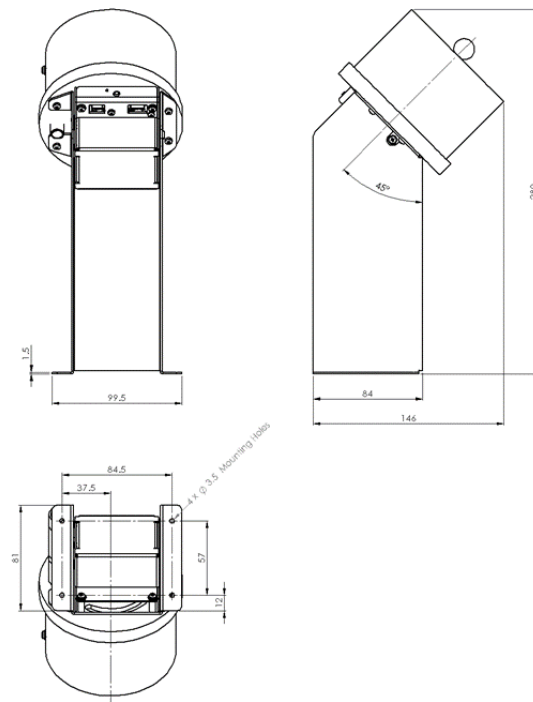
Product	Model
Pellet Dispenser for 14mg pellets (red disc) (excluding stand)	80209A-14
Pellet Dispenser for 20mg pellets (black disc) (excluding stand)	80209A-20
Pellet Dispenser for 45mg pellets (excluding stand)	80209A-45
Pellet Dispenser for 190mg pellets (excluding stand)	80209A-190
Stand to mount on operant chamber floor	80209A-S1
Stand to mount on operant chamber wall (NOR-OL)	80209A-S2
Stand to mount on Touch Screen chamber shelf	80209A-S3
190mg pellet wheel	80209A-W190
45mg pellet wheel	80209A-W45
20mg pellet wheel	80209A-W20
14mg pellet wheel (The 14mg pellet wheel is coloured red for easy differentiation from the 20mg wheel)	80209A-W14
Pellet detector for 14mg and 20mg pellets	80209A-D20
Pellet detector for 45mg pellets	80209A-D45
Pellet detector for 190mg pellets	80209A-D190
Replacement cable 1m	80209A-C1
Replacement cable Xm (X = customer specified)	80209A-C?

07 Dimensions (in mm)

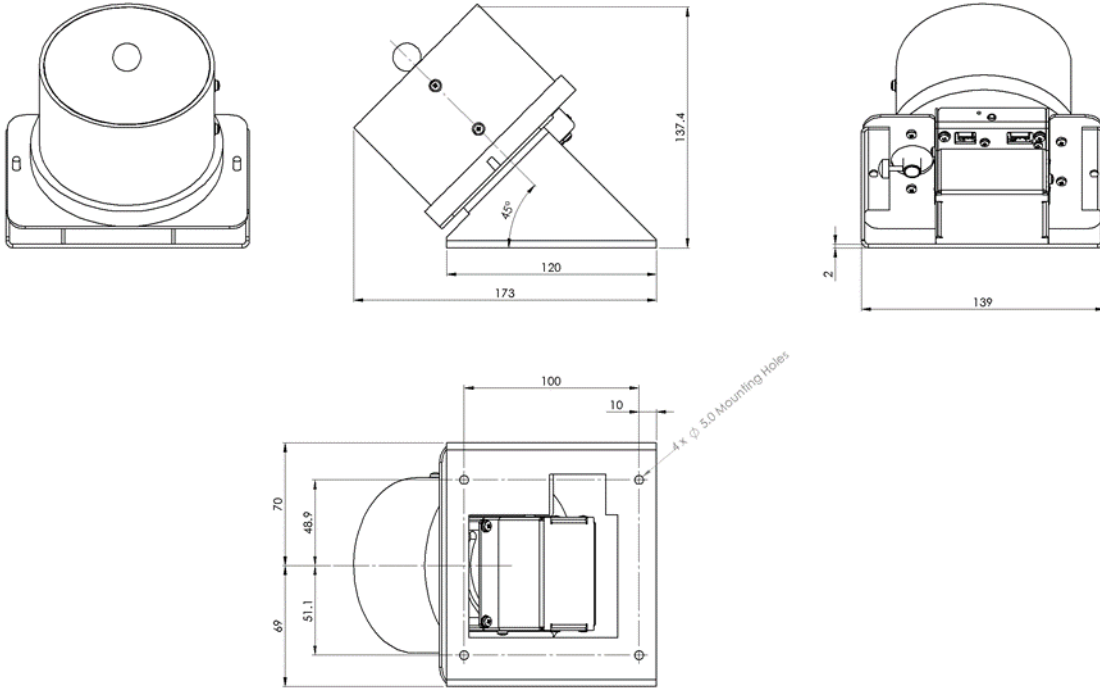


Stand Options

Operant Chamber Floor Mounting Stand 80209A-S1



Touchscreen Chamber Shelf Mounting 80209A-S3



08 EC Declaration of Conformity

1. **Product Model:**

Model Type: 80209A

2. **Manufacturer:**

Campden Instruments Ltd (a trading name of Certain Indexes Ltd.)
4 Park Road, Sileby, Loughborough, Leicestershire, LE12 7TJ, UK.

3. This declaration of conformity is issued under the sole responsibility of the manufacturer.

4. **Object of the Declaration:**

Pellet Feeder

5. The object of the declaration described above is in conformity with the relevant Essential Health & Safety Requirements of the following relevant Union harmonisation legislation:

- 2014/30/EU EMC Directive
- 2006/42/EC Machinery Directive
- 2011/65/EU RoHS Directive
- 2015/863 Amendment to RoHS Directive

6. References to the relevant harmonised standards used in relation to which conformity is declared:

- EN 60204-1:2006+A1:2009
- EN 61010-1:2010
- EN ISO 12100:2010
- BS EN 61326-1:2013
- BS EN 61000-4-3
- BS EN 61000-4-2
- BS EN 55011:2013

7. I hereby declare the equipment named above complies with the relevant CE Marking Legislation and I am the person authorised to compile the technical documentation.

Signed for and on behalf of:

Campden Instruments Ltd (address above) on [date]

G. Prescott (Managing Director)



***Ci* Campden
Instruments**

PO Box 4148
Loughborough, Leicestershire
LE12 7XT UK

Phone: (+44) 01509 814790
Fax: (+44) 01509 817701
info@campdeninstruments.com
www.campdeninstruments.com

Lafayette Instruments Co.
3700 Sagamore Parkway North
Lafayette, Indiana 47903 USA

Tel: (+1) 765 423 1505
Fax: (+1) 765 423 4111
ussales@campdeninstruments.com