

APPENDIX 2

Commissioning (Cx) Forms

Functional Testing

CFIA Charlottetown Laboratory

TABLE OF CONTENTS

Rooftop Exhaust Fan Test

FT01_EF100	Rooftop Exhaust Fan Unit EF100
FT01_EF101	Rooftop Exhaust Fan Unit EF101
FT01_EF201	Rooftop Exhaust Fan Unit EF201
FT01_EF203	Rooftop Exhaust Fan Unit EF203
FT01_EF207	Rooftop Exhaust Fan Unit EF207
FT01_EF208	Rooftop Exhaust Fan Unit EF208
FT01_EF209	Rooftop Exhaust Fan Unit EF209
FT01_EF210	Rooftop Exhaust Fan Unit EF210
FT01_EF212	Rooftop Exhaust Fan Unit EF212
FT01_EF213	Rooftop Exhaust Fan Unit EF213
FT01_EF215	Rooftop Exhaust Fan Unit EF215
FT01_EF216	Rooftop Exhaust Fan Unit EF216
FT01_EF221	Rooftop Exhaust Fan Unit EF221
FT01_EF222	Rooftop Exhaust Fan Unit EF222
FT01_EF224	Rooftop Exhaust Fan Unit EF224
FT01_EF226	Rooftop Exhaust Fan Unit EF226
FT01_EF229	Rooftop Exhaust Fan Unit EF229
FT01_EF230	Rooftop Exhaust Fan Unit EF230
FT01_EF309	Rooftop Exhaust Fan Unit EF309
FT01_EF310	Rooftop Exhaust Fan Unit EF310
FT01_EF313	Rooftop Exhaust Fan Unit EF313
FT01_EF314	Rooftop Exhaust Fan Unit EF314
FT01_EF319	Rooftop Exhaust Fan Unit EF319
FT01_EF320	Rooftop Exhaust Fan Unit EF320

Terminal Unit (VAV Box) Test

FT25_VAV218	Terminal Unit VAV218
FT26_VAV262	Terminal Unit VAV262
FT27_VAV215	Terminal Unit VAV215
FT28_VAV253	Terminal Unit VAV253
FT29_VAV203	Terminal Unit VAV203
FT30_VAV241	Terminal Unit VAV241
FT31_VAV209	Terminal Unit VAV209
FT32_VAV210	Terminal Unit VAV210

Laboratory Test

FT33_LABM201

Constant Volume Laboratory M2-01

FT34_LABM205

Constant Volume Laboratory M2-05

FT35_LABM213

Constant Volume Laboratory M2-13

FT36_LABM209 & LABM210

Variable Volume Laboratory M2-09 & M2-10

EXHAUST FAN TEST

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-100

Test #: FT01.EF100

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	
Any fan status indicators functioning	

Check Equip Tag->	Check or note #
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srtc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-101

Test #: FT02.EF101

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	
Any fan status indicators functioning	

Check Equip Tag->	Check or note #
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srtc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-201

Test #: FT03.EF201

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-203

Test #: FT04.EF203

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* Damper: *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** VFD: *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srcv factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-207

Test #: FT05.EF207

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-208

Test #: FT06.EF208

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ svc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-209

Test #: FT07.EF209

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-210

Test #: FT08.EF210

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srtc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-212

Test #: FT09.EF212

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srtc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-213

Test #: FT10.EF213

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ svc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-215

Test #: FT11.EF215

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ svc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-216

Test #: FT12.EF216

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-221

Test #: FT13.EF221

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-222

Test #: FT14.EF222

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ svc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-224

Test #: FT15.EF224

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-226

Test #: FT16.EF226

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* Damper: *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** VFD: *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-229

Test #: FT17.EF229

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-230

Test #: FT18.EF230

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* Damper: *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** VFD: *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srtc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-309

Test #: FT19.EF309

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* Damper: *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** VFD: *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srcv factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-310

Test #: FT20.EF310

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-313

Test #: FT21.EF313

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks.

The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.²Include tolerances for a passing condition.**-- END OF TEST --**

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-314

Test #: FT22.EF314

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks.

The actuators or devices listed below checked for calibration.
 "In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____%				
	2. Max.: _____%				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	Standby Check. With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-319

Test #: FT23.EF319

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- ☐ Connected Fume Hood Recertification ☐ Connected Terminal Units
☐ Variable speed drives for exhaust fans ☐ Fan Balancing Report

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* **Damper:** *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** **VFD:** *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____ rated FL amps x _____ srvc factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Rooftop Exhaust Fan EF-320

Test #: FT24.EF320

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

- | | |
|---|---|
| <input type="checkbox"/> Connected Fume Hood Recertification | <input type="checkbox"/> Connected Terminal Units |
| <input type="checkbox"/> Variable speed drives for exhaust fans | <input type="checkbox"/> Fan Balancing Report |

b. ☐ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

Controls Contractor Signature or Verbal

Date

c. ☐ Schedules and setpoints attached.

d. ☐ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks.

The actuators or devices listed below checked for calibration.
 "In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Exhaust air damper position or command *	1. Full open				
	2. Full closed				
Variable frequency drive(VFD) speed. (Level 3 fans only)**	1. Min.: _____ %				
	2. Max.: _____ %				

* Damper: *Procedure 1.* Command damper closed and verify that damper is shut and BAS reads shut. *Procedure 2.* Do the same, commanding damper fully open.

** VFD: *Procedure 1.* Command minimum fan speed. Verify that fan speed is at minimum *and* packaged controller reads the same. *Procedure 2.* Command maximum fan speed. Verify that fan speed is at its max and verify that the packaged controller reads the same. Return all to normal.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Permanent labels affixed	
Casing condition good: no dents, leaks, door gaskets installed	
Mountings checked and shipping bolts removed	
Vibration isolators installed	
Equipment guards installed	
Plenums clear of debris	
Fans rotate freely	
Duct system complete	
Electrical	
Electrical connections complete	
Disconnect switch installed	
Overload heaters in place	
Control connections complete	
VFD has been reconfigured (Level 3 fans only)	
Operational Checks	
Fan rotation correct	
Electrical interlocks verified	

Check Equip Tag->	Check or note #
Any fan status indicators functioning	
No unusual vibration or and noise	
Check full load running amps for each fan from balancing report: _____rated FL amps x _____srcv factor = _____ (Max amps). Running less than max?	
Check voltage: Rate = _____ Actual = _____ Within 5%?	
The disconnect switch properly operates	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

Test #	Mode	Test Procedure ¹ (including special conditions)	Expected Response ²	Pass Y/N	Note
1	FAN OFF	<u>Standby Check.</u> With Units Commanded off by BAS.	Verify by visual inspection that: Exhaust fan isolation air damper is closed		
2	UNIT STARTUP	With Units Commanded on by BAS	Supply fan isolation damper open. Exhaust fan starts.		
3	EXHAUST FAN ISOLATION DAMPER	Utilizing BAS, Command fan into the off position	Verify that fan isolation damper closes.		
4	EXHAUST FAN VFD DAYTIME (Level 3 fans only)	Initiate daytime laboratory operation	Ensure that fan VFD goes to daytime frequency setting and fan speed increases to maximum speed.		
5	EXHAUST FAN VFD NIGHT SETBACK (Level 3 fans only)	Initiate night set back laboratory operation	Ensure that fan VFD goes to night setback frequency setting and fan speed decreases to minimum speed.		
	REVIEW	Review schedules, current set points and sequences with controls drawing	Submit approved differences to be incorporated into as-builts.		

Record Foot Notes

¹Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

²Include tolerances for a passing condition.

-- END OF TEST --

TERMINAL UNIT TEST

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT25.VAV218

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) Procedure 1. Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. Procedure 2. Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. Procedure 3. Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** Procedure 1. Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. Procedure 2. Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. Procedure 3. From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. Procedure 4. From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT26.VAV262

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) *Procedure 1.* Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. *Procedure 2.* Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. *Procedure 3.* Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** *Procedure 1.* Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. *Procedure 2.* Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. *Procedure 3.* From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. *Procedure 4.* From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT27.VAV215

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) Procedure 1. Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. Procedure 2. Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. Procedure 3. Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** Procedure 1. Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. Procedure 2. Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. Procedure 3. From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. Procedure 4. From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT28.VAV253

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) Procedure 1. Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. Procedure 2. Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. Procedure 3. Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** Procedure 1. Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. Procedure 2. Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. Procedure 3. From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. Procedure 4. From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT29.VAV203

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) Procedure 1. Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. Procedure 2. Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. Procedure 3. Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** Procedure 1. Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. Procedure 2. Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. Procedure 3. From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. Procedure 4. From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT30.VAV241

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) Procedure 1. Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. Procedure 2. Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. Procedure 3. Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** Procedure 1. Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. Procedure 2. Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. Procedure 3. From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. Procedure 4. From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT31.VAV209

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range -- start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) *Procedure 1.* Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. *Procedure 2.* Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. *Procedure 3.* Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** *Procedure 1.* Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. *Procedure 2.* Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. *Procedure 3.* From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. *Procedure 4.* From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Terminal Unit (VAV Box) Test

Test #: FT32.VAV210

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have been started up and startup reports submitted ready for functional testing:

___ Connected Exhaust Fans

b. ___ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules and with debugging, loop tuning and sensor and device calibrations completed.

_____ Controls Contractor Signature or Verbal

_____ Date

e. ___ Hydronic test and balance completed by TAB specialist and report submitted.

d. ___ Air flow sensor has been calibrated by TAB specialist, and a test report has been submitted.

e. ___ Schedules and setpoints attached.

f. ___ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Device Calibration Checks. The actuators or devices listed below checked for calibration.

"In calibration" means observing a readout in the BAS and going to the actuator or controlled device and verifying that the BAS reading is correct. For items out of calibration or adjustment, fix now if easy, via an offset in the BAS, or a mechanical fix.

Device or Actuator & Location	Procedure / State	1st BAS Value	Site Observation	Final BAS Reading	Pass Y/N
Heating water control valve (pneumatic) position or command and stroke*	1. Full open				
	2. Full closed				
	3. Remove power (fail safe)				
VAV damper position or command **	1. Full open				
	2. Full closed				
	3. Full modulation over control signal range -start to open				
	4. Full modulation over control signal range – start to close (from full open position)				

* Set pumps to normal mode. Verify normally open and normally closed positions (fail safe) Procedure 1. Command valve to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full open. Visually verify valve is full open or take several consecutive temperature measurements of fin tube or coil. Procedure 2. Command valve to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says valve is full closed. Visually verify valve is full closed or take several consecutive temperature measurements of fin coil or heating coil. Procedure 3. Provide a control signal of 100% and then remove electricity from valve. Verify that valve stem and actuator move to the fail safe position

** Procedure 1. Command damper to full open by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full open. Visually verify damper is full open. Procedure 2. Command damper to full closed by providing either 100% of control signal or 0% of control signal (0-10V or 4-20mA signal). Verify BAS reading says damper is full closed. Visually verify damper is full closed. Procedure 3. From closed position, command damper to start opening by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position. Procedure 4. From full open position, command damper to start closing by providing either 99% of control signal or 1% of control signal. Verify BAS reading indicates damper has adjusted position. Visually verify damper has adjusted position.

4. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Cabinet and General Installation	
Model and tag checked against plans and equipment list. Permanent labels affixed	
Unit secured per manufacturer's recommendations and contract documents.	
Unit has sufficient clearance to be serviced.	
Inlet conditions OK: Smooth, round, straight duct for at least 3 duct diameters when possible and 2 diameters minimum for velocity pressure sensor for flow readings and 3 to 5 diameters for single point electronic sensors, else airflow straighteners, OR per manufacturer's recommendation.	
Any hot or chilled water piping installation complete with valves tagged.	
Ducting clear of debris.	
Duct Insulation installed as per contract documents.	
Duct system complete	

- The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

5. Functional Testing Record

(Complete functional testing of airside VAV operating sequence is found in Laboratory Commissioning Test Forms)

-- END OF TEST --

LABORATORY TEST

Functional Test

CFIA Charlottetown Laboratory

Constant Volume Laboratory M2-01

Test #: FT33.LABM201

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have Functional test reports have been completed:

____ All Terminal Unit (VAV Box) Functional Tests

____ All Rooftop Exhaust Fan Tests

b. ____ AHU S-2 Supply fan VFD's have been adjusted for the reduced day time airflow and the reduced night time airflow. Test report has been submitted.

c. ____ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Laboratory	
All ducting modifications in lab space have been performed as per contract documents including modification of BSC's and exhaust grille removal.	

• The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

4. Functional Testing Record

Before Testing lab ensure the following:

1. Ensure that doors to laboratory are closed.

#	Mode	Test Procedure (including special conditions)	Expected Response	Pass Y/N	Note #
	ROOM PRESSURIZATION DAYTIME MODE	Ensure that building controls (BAS) is set to daytime operating scheme.	<p>1. Verify by visual inspection that EA VAV adjusts to night setback airflow.</p> <p>EA VAV flow spec'd = ____ LPS EA VAV flow actual (LPS) = ____ Is required ACH rate met?</p> <p>2. Verify that SA flow tracks EA flow.</p> <p>Room OFFSET flow spec'd = ____ LPS Room OFFSET flow measured = ____ LPS</p> <p>Room EA flow measured = ____ LPS (include other known constant airflows sources)</p> <p>Room SA flow calculated by BAS = ____ LPS Room SA flow measured = ____ LPS</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (<i>circle</i>)</p> <p>Room press differential desired = ____ Pa Room press differential measured = ____ Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor:</p> <p>Air flows IN or OUT of laboratory to corridor (<i>circle</i>)</p>		

2	ROOM PRESSURIZATION NIGHT SETBACK MODE	Ensure that building controls (BAS) is set to night setback operating scheme.	<p>1. Verify by visual inspection that EA VAV adjusts to night setback airflow.</p> <p>EA VAV flow spec'd = ____ LPS EA VAV flow actual (LPS) = ____ Is required ACH rate met?</p> <p>2. Verify that SA flow tracks EA flow.</p> <p>Room OFFSET flow spec'd = ____ LPS Room OFFSET flow measured = ____ LPS</p> <p>Room EA flow measured = ____ LPS (include other known constant airflows sources)</p> <p>Room SA flow calculated by BAS = ____ LPS Room SA flow measured = ____ LPS</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (<i>circle</i>)</p> <p>Room press differential desired = ____ Pa Room press differential measured = ____ Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor:</p> <p>Air flows IN or OUT of laboratory to corridor (<i>circle</i>)</p>		
3	AIR FLOW AND TEMPERATURE TRENDING	Over a three day period trend ROOM TEMP, VAV REHEAT control valve position, PERIM HEAT control valve position, SA flow, EA flow, OFFSET flow, room PRESSURE and all associated setpoints at 10 min intervals.	<p>Review trends logs. Compare actual air flow and temp measurements to respective setpoints. Observe that measurement values do not drift significantly outside of deadband ranges and ensure no significant hunting or overshooting.</p> <p>Attach representative graphs or columnar data and explanatory analysis to this report.</p>		
4	REVIEW	Review schedules, original programming, current setpoints and sequences with Project Specification	Submit approved differences to be incorporated into as-builts.		

END OF TEST

Functional Test

CFIA Charlottetown Laboratory

Constant Volume Laboratory M2-05

Test #: FT34.LABM205

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have Functional test reports have been completed:

_____ All Terminal Unit (VAV Box) Functional Tests

_____ All Rooftop Exhaust Fan Tests

b. _____ AHU S-2 Supply fan VFD's have been adjusted for the reduced day time airflow and the reduced night time airflow. Test report has been submitted.

c. _____ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Laboratory	
All ducting modifications in lab space have been performed as per contract documents including modification of BSC's and exhaust grille removal.	

• The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

4. Functional Testing Record

Before Testing lab ensure the following:

1. Ensure that doors to laboratory are closed.

#	Mode	Test Procedure (including special conditions)	Expected Response	Pass Y/N	Note #
1	ROOM PRESSURIZATION DAYTIME MODE	Ensure that building controls (BAS) is set to daytime operating scheme.	<p>1. Verify by visual inspection that EA VAV adjusts to night setback airflow.</p> <p>EA VAV flow spec'd = ____ LPS EA VAV flow actual (LPS) = ____ Is required ACH rate met?</p> <p>2. Verify that SA flow tracks EA flow.</p> <p>Room OFFSET flow spec'd = ____ LPS Room OFFSET flow measured = ____ LPS</p> <p>Room EA flow measured = ____ LPS (include other known constant airflows sources)</p> <p>Room SA flow calculated by BAS = ____ LPS Room SA flow measured = ____ LPS</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (circle)</p> <p>Room press differential desired = ____ Pa Room press differential measured = ____ Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor:</p> <p>Air flows IN or OUT of laboratory to corridor (circle)</p>		

2	ROOM PRESSURIZATION NIGHT SETBACK MODE	Ensure that building controls (BAS) is set to night setback operating scheme.	<p>1. Verify by visual inspection that EA VAV adjusts to night setback airflow.</p> <p>EA VAV flow spec'd = _____ LPS EA VAV flow actual (LPS) = _____ Is required ACH rate met?</p> <p>2. Verify that SA flow tracks EA flow.</p> <p>Room OFFSET flow spec'd = _____ LPS Room OFFSET flow measured = _____ LPS</p> <p>Room EA flow measured = _____ LPS (include other known constant airflows sources)</p> <p>Room SA flow calculated by BAS = _____ LPS Room SA flow measured = _____ LPS</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (circle)</p> <p>Room press differential desired = _____ Pa Room press differential measured = _____ Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor:</p> <p>Air flows IN or OUT of laboratory to corridor (circle)</p>		
3	AIR FLOW AND TEMPERATURE TRENDING	Over a three day period trend ROOM TEMP, VAV REHEAT control valve position, PERIM HEAT control valve position, SA flow, EA flow, OFFSET flow, room PRESSURE and all associated setpoints at 10 min intervals.	<p>Review trends logs. Compare actual air flow and temp measurements to respective setpoints. Observe that measurement values do not drift significantly outside of deadband ranges and ensure no significant hunting or overshooting.</p> <p>Attach representative graphs or columnar data and explanatory analysis to this report.</p>		
4	REVIEW	Review schedules, original programming, current setpoints and sequences with Project Specification	Submit approved differences to be incorporated into as-builts.		

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Constant Volume Laboratory M2-13

Test #: FT35.LABM213

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have Functional test reports have been completed:

_____ All Terminal Unit (VAV Box) Functional Tests

_____ All Rooftop Exhaust Fan Tests

b. _____ AHU S-2 Supply fan VFD's have been adjusted for the reduced day time airflow and the reduced night time airflow. Test report has been submitted.

c. _____ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Laboratory	
All ducting modifications in lab space have been performed as per contract documents including modification of BSC's and exhaust grille removal.	

• The above checklist items are all successfully completed for given trade...___ YES ___ NO

General Conditions of Test

4. Functional Testing Record

Before taking measurements ensure that the doors to laboratory are closed.

#	Mode	Test Procedure (including special conditions)	Expected Response	Pass Y/N	Note #
1	ROOM PRESSURIZATION DAYTIME MODE	Ensure that building controls (BAS) is set to daytime operating scheme.	<p>1. Verify by visual inspection that EA VAV adjusts to night setback airflow.</p> <p>EA VAV flow spec'd = _____ LPS EA VAV flow actual (LPS) = _____ Is required ACH rate met?</p> <p>2. Verify that SA flow tracks EA flow.</p> <p>Room OFFSET flow spec'd = _____ LPS Room OFFSET flow measured = _____ LPS</p> <p>Room EA flow measured = _____ LPS (include other known constant airflows sources)</p> <p>Room SA flow calculated by BAS = _____ LPS Room SA flow measured = _____ LPS</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (circle)</p> <p>Room press differential desired = _____ Pa Room press differential measured = _____ Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor or lab space:</p> <p>Air flows IN or OUT of laboratory to corridor (circle) Air flows IN or OUT of laboratory to MO-12 (circle) Air flows IN or OUT of laboratory to M2-15 (circle) Air flows IN or OUT of laboratory to M2-14 (circle) Air flows IN or OUT of laboratory to M2-11 (circle)</p>		

#	Mode	Test Procedure (including special conditions)	Expected Response	Pass Y/N	Note #
2	ROOM PRESSURIZATION NIGHT SETBACK MODE	Ensure that building controls (BAS) is set to night setback operating scheme.	<p>1. Verify by visual inspection that EA VAV adjusts to night setback airflow.</p> <p>EA VAV flow spec'd = ____ LPS EA VAV flow actual (LPS) = ____ Is required ACH rate met?</p> <p>2. Verify that SA flow tracks EA flow.</p> <p>Room OFFSET flow spec'd = ____ LPS Room OFFSET flow measured = ____ LPS</p> <p>Room EA flow measured = ____ LPS (include other known constant airflows sources)</p> <p>Room SA flow calculated by BAS = ____ LPS Room SA flow measured = ____ LPS</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (circle)</p> <p>Room press differential desired = ____ Pa Room press differential measured = ____ Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor or lab space:</p> <p>Air flows IN or OUT of laboratory to corridor (circle) Air flows IN or OUT of laboratory to MO-12 (circle) Air flows IN or OUT of laboratory to M2-15 (circle) Air flows IN or OUT of laboratory to M2-14 (circle) Air flows IN or OUT of laboratory to M2-11 (circle)</p>		
3	AIR FLOW AND TEMPERATURE TRENDING	Over a three day period trend ROOM TEMP, VAV REHEAT control valve position, PERIM HEAT control valve position, SA flow, EA flow, OFFSET flow, room PRESSURE and all associated setpoints at 10 min intervals.	Review trends logs. Compare actual air flow and temp measurements to respective setpoints. Observe that measurement values do not drift significantly outside of deadband ranges and ensure no significant hunting or overshooting. Attach representative graphs or columnar data and explanatory analysis to this report.		
4	REVIEW	Review schedules, original programming, current setpoints and sequences with Project Specification	Submit approved differences to be incorporated into as-builts.		

-- END OF TEST --

Functional Test

CFIA Charlottetown Laboratory

Variable Volume Laboratory M2-09 & M2-10

Test #: FT36.LABM209.LABM210

Related Tests: _____

1. Participants

Party

Participation

_____	_____
_____	_____
_____	_____

Party filling out this form & witnessing _____ Date of test _____

2. Prerequisite Checklist

a. The following have Functional test reports have been completed:

____ All Terminal Unit (VAV Box) Functional Tests

____ All Rooftop Exhaust Fan Tests

b. ____ AHU S-2 Supply fan VFD's have been adjusted for the reduced day time airflow and the reduced night time airflow. Test report has been submitted.

c. ____ **Control Program Review.** Review the software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.

3. Installation Checks.

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->	Check or note #
Laboratory	
All ducting modifications in lab space have been performed as per contract documents including modification of BSC's and exhaust grille removal.	

• The above checklist items are all successfully completed for given trade...__ YES __ NO

General Conditions of Test

4. Functional Testing Record

Before taking measurements ensure that the doors to laboratory are closed.

#	Mode	Test Procedure (including special conditions)	Expected Response	Pass Y/N	Note #
1	ROOM PRESSURIZATION MINIMUM VENTILATION	Close fume hood sash.	<p>1. Verify by visual inspection that SA VAV # 210 modulates to minimum position.</p> <p>SA VAV airflow (l/s) = ____.</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (circle)</p> <p>Room press differential setpoint = ____Pa Room press differential measured = ____Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor or lab space:</p> <p>Air flows IN or OUT of laboratory to corridor (circle)</p>		
2	ROOM PRESSURIZATION MAXIMUM VENTILATION	Open fume hood sash to maximum normal position.	<p>1. Verify by visual inspection that SA VAV # 210 modulates to open position.</p> <p>SA VAV airflow (l/s) = ____.</p> <p>3. Verify that room pressure differential to corridor is maintained:</p> <p>Desired POSITIVE or NEGATIVE room press (circle)</p> <p>Room press differential setpoint = ____Pa Room press differential measured = ____Pa</p> <p>4. Physically verify with smoke test or tissue test for proper air flow beneath door to neighboring corridor or lab space:</p> <p>Air flows IN or OUT of laboratory to corridor (circle)</p>		

#	Mode	Test Procedure (including special conditions)	Expected Response	Pass Y/N	Note #
3	AIR FLOW AND TEMPERATURE TRENDING	Over a three day period trend ROOM TEMPS, VAV REHEAT control valves position, PERIM HEAT control valve position, SA flows, EA flow, room PRESSURE and all associated setpoints at 10 min intervals.	Review trends logs. Compare actual air flow and temp measurements to respective setpoints. Observe that measurement values do not drift significantly outside of deadband ranges and ensure no significant hunting or overshooting. Attach representative graphs or columnar data and explanatory analysis to this report.		
4	REVIEW	Review schedules, original programming, current setpoints and sequences with Project Specification	Submit approved differences to be incorporated into as-builts.		

-- END OF TEST --

