COMBO PERFORMANCE SPECIFICATION SUMMARY (Ref. CSA Standard P.9-11)

Testing Agency:	Exova	Model Number:	N/A
System Integrator:	iFLOW HVAC Inc.		
	29 Howden Road		
	Toronto, ON	Nameplate Information:	120 Volts N/A Amps
	M1R 3C7	Nominal Burner Input:	43.9 kW 150,000 Btu/hr
Date First Issued:	May 4, 2016	Fuel Type:	Nat. Gas Nat. Gas / Propane / Oil
Date Reissued:	April 17, 2019		
Rationale:	To include missing info		

PERFORMANCE RATING

Thermal Performance Factor (TPF)	0.91
Annual Electrical Consumption (AE)	833 kWh/y

Function-Based Performance Ratings

Efficiency Ratings

Composite Space Heating Efficiency (CSHE)	90	(%)
Water Heating Performance Factor (WHPF)	0.96	
Recovery Efficiency	97	(%)
Thermal standby loss - Circ fan off	see comments	W
Thermal standby loss - Circ fan on	see comments	W

Space Heating Part Load Efficiency Ratings

Part Load Factor (PLF)	Net Efficiency	Average Electricity Use	Circulating Blower Electricity Use*
@ PLF 1	98 (%)	436 W	316 W
@ PLF 0.4	92 (%)	137 W	133 W
@ PLF 0.15	82 (%)	62 W	130 W

* measured when circulation blower running

Concurrent Space & DHW Test Results

Water draws at 49 ±3°C with & without concurrent call for heat

Flow	Time to reach temperature (minutes)		Time within ±3°C tolerance (minutes)	
(L/min)	with heating call	without heating call	with heating call	without heating call
3	1.2	1.2	indefinite	indefinite
15	0.4	0.4	indefinite	indefinite

Maximum Capacity Ratings and Related Information

Space heating (all ratings below are at a PLF of 1)

Capacity	21,417 *Btu/hr*	6.3	kW
Airflow	588 *SCFM*	277	L/s
ESP (Return)	0.6 *" w.c.*	150	Pa
ESP (Supply)	0.9 *" w.c.*	225	Pa
Return air temperature		22.0	°C
Air temperature rise		18.8	°C
Entering water temperature to coil		49.3	°C
Water flow rate	3.0 *USGPM*	11.4	L/min

DHW One-Hour Delivery Rating (OHR)

OHR - no call for space heating	1,116	L
OHR - concurrent call for space heating	1,094	L

Additional Electrical Ratings

Standby power (P(circ))	102	W
Standby power (P(cont))	13	W
Daily electricity use for water heating ($E_{24h\text{-}SUT}$)	0.18	kWh
Annual electricity use for water heating (AE_{DHW})	66	kWh

Description of Major Components of Packaged Combo

Packaged System Components

Heat Generator (HG) make, model:	Navien, NPE 180A
Air Handler (AH) make, model:	iFLOW, iFH-1420P0 (Also applies to iFLH140000, iFLH14000W, iFLH14000D)
Circulating blower motor make, model, size, type:	Genteq, 5SBA39GL, 1/2 HP, Eon ECM
Circulator make / model and location:	Navien, integral to heat generator
Additional controls external to HG and AH:	None

Automatic means for adjusting water temperature while space heating (Y/N):	Y
Related type, make and model number:	Navien *'ComfortAir$^+$'* kit, PNBD 000001
Interconnect piping (length, nom.dia., insulation):	10 ft. equivalent length, 3/4" (nominal) PEX, R4 insulation
Other:	Thermostatic mixing valve c/w check valves, Honeywell AM101-US-1, set to 120°F (49°C) for DHW
	Outdoor temperature sensor - included in *'ComfortAir$^+$'* kit
	DHW flow switch - included in *'ComfortAir$^+$'* kit

Test Agency Comments:

Water heater temperature set to 120°F (49°C) for DHW tests

Water heater temperature programmed to120°F (49°C) for space heating (PLF=1).

Pump exercise sequence: 0.5 minutes every 24-hrs

Pump exercise sequence does not initiate burner operation

Circulating blower has a 60 second ramp to 'On' delay

Circulating blower has a 120 second 'Off' delay

All controls set to factory default unless otherwise specified

No storage tank - thermal standby test not required

Filter use during testing		Yes	x	No
Filter rating				MERV
Segregated DHW System		Yes	x	No
Water Circulation	x	Yes		No
DHW Priority	x	Yes		No

Conversions:
249 Pascals = 1" of Water 1 kW = 3413 Btu/h 1 L/s = 2.12 SCFM 1 USG = 3.785 L

Reference Report:
16-06-M0105-1-Rv1