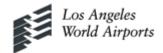


	PROJECT:			
Equipn	nent Name/Tag:Loc	cation:		
System	n/Area Served: Rela	ated Equipmer	nt:	
_	Air Handling U	J nit		
Instruct	tions: Step 1: Circle Yes or No and fill in with requested information	on		
T4om	Step 2: Explain all "No" responses at the bottom of the check Task Description		ponse	Comments
Item 1	Delivery Book	INCO	onse	Comment:
A	Model Verification	Submitted	Delivered	
A 1	Manufacturer	Suomma	Denvered	
2	Manufacturer Model	-	╂	
3	Serial Number	N/A	+	
4	Cooling Capacity (MBH/gpm)	IN/ FA	+,	
5	Heating Capacity (MBH/gpm)	<u> </u>	 	
	<u> </u>		 	
6	Supply Air Flow, Design / Minimum (cfm)		<u> </u>	
7	Supply Fan Motor Power / Speed (hp/rpm)		 	
8	Return Air flow, Design / Minimum (cfm)	 	┦——	
9	Return Fan Motor Power / Speed (hp/rpm)	_	 	
10 P	Voltage / Phase / Frequency (V / - / Hz)	/ /	 	
В	Physical Checks		 	
1	Unit is free from physical damage	Yes	No	
2	Coil surface areas are free of damage	Yes	No	
3	The air openings are sealed with plastic	Yes	No	
4	The water openings are sealed with plastic plugs	Yes	No	
5	All components present and in proper order	Yes	No	
6	All access doors are operable	Yes	No	
7	Installation and startup manual provided	Yes	No	
8	Unit tags affixed	Yes	No	
2	Construction Checklist			
A	Installation of AHU			
1	Unit secured as required by manufacturing and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from the building	Yes	No	
5	Cooling coil drain pan slopes correctly	Yes	No	
6	Internal vibration isolators in good condition and shipping bolts are removed	Yes	No	
7	Belts are tight	Yes	No	
		Yes	No	-
·		100	1110	
Contac	tor: LAW	VA Representa	ative:	
Checks	by: Date:; Checks	s by:		Date:
	issioning	• –		
Agency	y:			
	by: Date:; Checks	s by:		Date:
	Print name Signature	Print nar	me Sign	nature



LAWA Commissioning Forms Air Handling Unit (Continued)

Instruct	ions: Step 1: Circle Yes or No and fill in with requested information			
<u> </u>	Step 2: Explain all "No" responses at the bottom of the check			
Item	Task Description	R	esponse	Comment:
В	Chilled Water Piping	**		
1	All piping components have been installed (in the correct order) as required by detail drawing	Yes	No	
2	Piping arranged for ease of unit /coil removal	Yes	No	
3	Piping supported as required by specification	Yes	No	
4	Piping is clean	Yes	No	
5	Piping insulation is complete and installed as per specifications	Yes	No	
6	All valves and test ports are easily accessible	Yes	No	
7	Valve tags attached	Yes	No	
C	Hot Water Piping	105	110	
	All piping components have been installed (in the correct order)	Yes	No	
1	as required by detail drawing			
2	Piping arranged for ease of unit/coil removal	Yes	No	
3	Piping supported as required by specifications	Yes	No	
4	Piping is clean	Yes	No	
5	Piping insulation is complete and installed per specifications	Yes	No	
6	All valves and test ports are easily accessible	Yes	No	
7	Valve tags attached	Yes	No	
D	Ductwork			
1	Adequate locations available for testing and balancing of unit	Yes	No	
2	All dampers and sensors are accessible (access panels)	Yes	No	
	Outdoor and return air arrangement will not freeze coils, i.e.	Yes	No	
3	outdoor air and return air is adequately mixed before reaching			
	coils			
4	Vibration isolators installed	Yes	No	
5	All dampers close tightly and stroke fully and easily	Yes	No	
6	Ductwork is clean and free of debris	Yes	No	
E	Electrical			
1	Local disconnect installed in accessible location	Yes	No	
2	Motor rotation in the proper direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	
5	VFD installed (if applicable)	Yes	No	
F	Controls – installation			
1	Control panel accessible and labeled properly	Yes	No	
	Temperature, humidity, pressure, and CO ₂ sensors(as	Yes	No	
2	applicable) are installed and calibrated			
3	Dampers actuators installed and calibration verified	Yes	No	
4	Hot and chilled water actuators installed and calibration verified	Yes	No	
_	Safety items installed and verified (freezestat, high pressure,	Yes	No	
5	motor overland, etc.)			
Contac		A Donness	ntativa:	<u> </u>
Contac	LAW.	A Represe	mauve:	
Chaolso	by:; Checks	by		Date:
	issioning Date:; Checks	υy		Date
Agency	e e e e e e e e e e e e e e e e e e e			
	by: Date:; Checks	by:		Date:
CHECKS	Print name Signature	Print	name	Signature



LAWA Commissioning Forms Air Handling Unit (Continued)

Instruct	ions: Step 1: Circle Yes or No and fill in with requested informatio			
T4	Step 2: Explain all "No" responses at the bottom of the check		. "	G 4
Item	Task Description	K	esponse	Comment:
G	Mechanical – startup	37	NI.	
1	Unit is clean	Yes	No	
2	Internal isolators free to move Fans and motors lubricated and aligned	Yes	No	
3		Yes	No	
5	Fan belts have proper tension and in good condition Protective shrouds for fans and belts in place and secure	Vac	N _a	
3		Yes Yes	No No	
6	Terminal unit dampers manually opened or are controllable and open	res	NO	
7	Filters installed properly (no bypass air) and are clean	Yes	No	
8	System starts and runs without any unusual noise or vibration	Yes	No	
9	Manufacturer's startup checklist completed and attached	Yes	No	
Н	Controls – startup			
1	Cooling sequence of control verified	Yes	No	
2	Heating sequence of control verified	Yes	No	
3	Warm-up sequence of control verified	Yes	No	
4	Cool-down sequence of control verified	Yes	No	
5	Economizer sequence of control verified	Yes	No	
6	Unoccupied sequence of control verified	Yes	No	
I	TAB			
1	Filters and coils are clean	Yes	No	
2	Motor rotation verified – each motor	Yes	No	
3	Motor voltage and amps verified – each phase of each motor	Yes	No	
4	Fan RPM verified – each fan	Yes	No	
5	Entering and leaving cooling coil air temperature (°F)	Yes	No	
6	Entering and leaving heating coil temperature (°F)	Yes	No	
7	Entering and leaving chilled water temperature (°F)	Yes	No	
8	Entering and leaving hot water temperature (°F)	Yes	No	
9	Coil flow and air/water pressure drops verified – each coil	Yes	No	
	1			
"NO" I	Responses			
Item	Date	Reason	for "NO" respon	nse
			·	
		1		
Contac	tor: LAW	A Represe	entative:	
Checks Commit Agency Checks	issioning by: Date:; Checks	by:		Date:
	Print name Signature	Print	name Si	ignature



LAWA Commissioning Forms Boiler, Hot Water

Instruct	tions: Step 1: Circle Yes or No and fill in with requested information					
Item	Step 2: Explain all "No" responses at the bottom of the check. Task Description	1	nonco	Comment:		
1	Delivery Book	Kesp	ponse	Comment.		
A	Model Verification	Submitted	Delivered			
1	Manufacturer	Buomittee	Denvered			
2	Model	-	 			
3	Serial number	N/A	 			
4	Total Heating Capacity (MBH)	1 1/12	 			
5	Voltage / Phase / Frequency (V/ -/ Hz)	/ /	/ /			
6	Entering / Leaving Hot Water Temperature (°F)	/	/			
В	Physical Checks					
1	Unit is free from physical damage	Yes	No			
2	The water openings are sealed with plastic plugs	Yes	No			
3	All components present	Yes	No			
4	Installation and startup manual provided	Yes	No			
5	Unit tags affixed	Yes	No			
2	Construction checklist	100	1,3			
A	Installation of Boiler					
1	Unit secured as required by manufacturer and specifications	Yes	No			
2	Adequate clearance around unit for service	Yes	No			
3	All components accessible for maintenance	Yes	No			
4	Unit can be removed from building	Yes	No			
5	Flue completely installed and properly sloped	Yes	No			
6	Unit labeled and is easy to see	Yes	No			
В	Piping	100	1,3			
1	All piping components have been installed (in the correct order) as required by detail drawing	Yes	No			
2	Piping arranged for ease of unit removal	Yes	No			
3	Piping supported as required by specifications	Yes	No			
4	Piping is clean	Yes	No			
5	Piping insulation is complete and installed as per specifications	Yes	No			
6	Thermometers and pressure gauges on supply and return lines	Yes	No			
7	All valves and test ports are easily accessible	Yes	No			
8	1 ,	Yes	No			
C	Electrical					
1	Local disconnect installed in accessible location	Yes	No			
2	All electrical connections are tight	Yes	No			
3	All electrical components are grounded	Yes	No			
	1					
			1			
Contac	tor: LAW	A Representa	ative:			
Chaoks	by:; Checks	. L.,,		Date:		
	issioning	оу		Date		
Agency						
		by		Date:		
CHECKS	Checks by: Date:; Checks by: Date: Date:					



LAWA Commissioning Forms Boiler, Hot Water (Continued)

Instruct	ions: Step 1: Circle Yes or No and fill in with requested information			
	Step 2: Explain all "No" responses at the bottom of the check			
Item	Task Description	R	Response	Comment:
D	Controls - Installation			
1	Control panel accessible and labeled properly	Yes	No	
2	Remote start and stop verified	Yes	No	
3	Hot water temperature reset signal verified (if applicable)	Yes	No	
4	Test ports installed near all control sensors	Yes	No	
5	Actuators installed and calibration verified	Yes	No	
E	Mechanical - Startup			
1	System flushed, filled, and air purged	Yes	No	
2	Burner adjusted to proper settings	Yes	No	
3	System starts and runs without any unusual noise or vibration	Yes	No	
4	Manufacturer's startup checklist completed and attached	Yes	No	
5	CO ₂ and CO values from burner adjustment (ppm/ppm)	Yes	No	
F	Controls –Startup			
1	Low water switch operational	Yes	No	
2	Temperature sensors operational and calibrated	Yes	No	
3	Flow switch operational	Yes	No	
4	High pressure/ temperature cut out operational	Yes	No	
5	Unit operation sequence verified and correct	Yes	No	
Item	Date	Reason	for "NO" respon	ses
		-		
		-		
		1		
		1		
Contac	tor: LAW	A Represo	entative:	
	by: Date:; Check	s by:		Date:
Agency Checks	by:; Check	s by:		Date:
	Print name Signature	Print	name Si	gnature



LAWA Commissioning Forms Centrifugal Chiller

	ions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the check	lant		
Item	Task Description	1	ponse	Comment:
1	Delivery Book	Ксэр	Jonse	Comment.
A	Model Verification	Submitted	Delivered	
A 1	Manufacturer	Suomma	Denvered	
2	Model	 	╂	
3	Serial number	N/A	╂	
4	Capacity (tons)	IN/A	╂	
5	Capacity (tons) Condenser Fluid Type	 	╂	
6	Condenser Fluid Type Condenser Fluid Flow rate (gpm)	╢——	╂	
7	Condenser Fluid Flow rate (gpm) Chilled Fluid Type	╂	╂	-
8	Chilled Fluid Type Chilled Fluid Flow rate (gpm)	╢——	╂	
9	Refrigerant Type	╂	╂	
10	Compressor Motor Power (kW)	╂	╂	
10		/ /	 	
	Compressor Motor Voltage / Phase / Frequency (V / - / Hz) Physical Checks	/ /	/ /	
<u>B</u>		¥7	XT.	
1	Unit is free from physical damage	Yes	No No	
2	Openings are sealed with plastic	Yes	No No	
3	All components present (cooler, condenser, compressor, motor, etc)	Yes	No	
4	Motor bearings are double sealed and permanently lubricated	Yes	No	
5	Electrical disconnect is provided	Yes	No	
6	Installation and startup manual provided	Yes	No	
7	Unit tags affixed	Yes	No	
2	Construction checklist			
A	Installation of Chiller			
1	Unit secured as required by manufacturer and specifications	Yes	No	
2	There is a minimum of 36 inches of clearance around entire unit	Yes	No	
3	There is a minimum of 48 inches of clearance in front of starter or VFD	Yes	No	
4	There is a minimum clearance of one unit length for tube pull	Yes	No	
'	snace			
5	space All components are accessible for maintenance	Yes	No	
5		Yes Yes	No No	
	All components are accessible for maintenance	-	H — — — — —	
6	All components are accessible for maintenance Unit labeled and is easy to see	-	H — — — — —	
6 B	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician	Yes	No	
6 B	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached	Yes Yes	No No No	
6 B 1 2 3	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached Relief piped to outdoors	Yes Yes Yes	No No	
6 B 1 2 3 4	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached Relief piped to outdoors Refrigerant monitor installed and operational before refrigerant loaded	Yes Yes Yes Yes Yes Yes Yes	No No No No No No	
6 B 1 2 3	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached Relief piped to outdoors Refrigerant monitor installed and operational before refrigerant	Yes Yes Yes Yes Yes	No No No	
6 B 1 2 3 4	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached Relief piped to outdoors Refrigerant monitor installed and operational before refrigerant loaded Drip leg and flex connector at unit connection to relief piping	Yes Yes Yes Yes Yes Yes Yes	No No No No No No No	
6 B 1 2 3 4 5 Contac Checks	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached Relief piped to outdoors Refrigerant monitor installed and operational before refrigerant loaded Drip leg and flex connector at unit connection to relief piping tor: LAW. by:	Yes Yes Yes Yes Yes Yes A Representa	No No No No No No No ative:	Date:
6 B 1 2 3 4 5 Contac Checks Commi	All components are accessible for maintenance Unit labeled and is easy to see Refrigerant Full tightened by chiller startup technician Unit factory leak tested and report is attached Relief piped to outdoors Refrigerant monitor installed and operational before refrigerant loaded Drip leg and flex connector at unit connection to relief piping tor: LAW. by:	Yes Yes Yes Yes Yes Yes Yes A Representation	No No No No No No No ative:	



LAWA Commissioning Forms Centrifugal Chiller (Continued)

Instruct	tions: Step 1: Circle Yes or No and fill in with requested information			
<u> </u>	Step 2: Explain all "No" responses at the bottom of the check			<u> </u>
Item	Task Description	K	Response	Comment:
C	Electrical		المستياك	<u> </u>
1	Lugs tightened by chiller startup technician	Yes	No	<u> </u>
2	Safety disconnect switch installed in an accessible location	Yes	No	<u> </u>
3	Lug sizing matches wire size requirement	Yes	No	
4	Primary and secondary fused control power transformer	Yes	No	·
	provided			<u> </u>
5	Star-delta starter provided	Yes	No	
6	AIC and withstand ratings exceed available fault shown on	Yes	No	· · · · · · · · · · · · · · · · · · ·
·	electrical drawing s	1		il'
7	VFD installed (if applicable)	Yes	No	· · · · · · · · · · · · · · · · · · ·
D	Controls - Installation			· · · · · · · · · · · · · · · · · · ·
1	Control panel accessible and labeled properly	Yes	No	
2	All sensors are installed and calibrated	Yes	No	'
3	Safety items installed and verified	Yes	No	1
E	Controls - Startup			,
1	Unit voltage and amps verified	Yes	No	ı '
2	Remote start and stop signal verified	Yes	No	1
3	Chilled water reset signal verified	Yes	No	1
4	Demand limiting signal verified	Yes	No	1
5	Unit "run" sequences verified	Yes	No	ı
6	Unit "alarm" sequences verified	Yes	No	1
F	Mechanical - Startup	105		ı
1	Manufacturer's startup checklist completed and attached	Yes	No	1
2	The following safety controls are operational and have been	Yes	No	1
, [~]	verified	105	110	·
3	Low chilled water temperature	Yes	No	
4	High refrigerant pressure	Yes	No	1
5	Low oil flow protection	Yes	No	1
6	Loss of chilled water flow	Yes	No	1
7	Loss of condenser flow Loss of condenser flow	Yes	No No	ı
		_		ı
8	Loss of refrigerant protection	Yes	No No	<u> </u>
9	Motor current overload	Yes	No No	ı
10	Phase reversal / unbalance/single phasing	Yes	No	<u> </u>
11	Over/ under voltage	Yes	No	ı
12	Failure of water temperature sensor used by controller	Yes	No	4
	Full load test to verify load limiting	Yes	No	1
14	System starts and runs without any unusual noise or vibration	Yes	No	1
				4
<u></u>	<u></u>			<u> </u>
Contac	tor: LAW	VA Represe	ntative:	
~1	Determine the Charles	-		.
	by: Date:; Checks	s by:		Date:
	issioning			
Agency		•		Date
Checks	by: Date:; Checks Print name Signature	s by:		Date:
i .	Print name Signature	riint '	name s'	agnature



LAWA Commissioning Forms Centrifugal Chiller (Continued)

Instruct	ions: Step 1: Circle Yes or No and fill in with requeste	ed information		
T	Step 2: Explain all "No" responses at the bottom		. II	<u> </u>
Item	Task Description	- K	Response	Comment:
G	TAB	37	N.T.	
1	Chilled water strainer is clean	Yes	No	
2	Evaporator pressure drop (ft)	Yes	No	
3	Chilled water flow rate (gpm)	Yes	No	
4	Condenser water strainer is clean	Yes	No	
5	Condenser water pressure drop (ft)	Yes	No	
6	Condenser water flow rate (gpm)	Yes	No	
"NO"]	Responses:			
— .				
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses
Item	Date	Reason	for "NO" respon	ses

Contactor:					
Checks by: Commissioning		Date:	; Checks by:		Date:
Agency: Checks by: Print name	Signature	Date:	; Checks by: Print name	Signature	Date:



LAWA Commissioning Forms Cooling Tower

Instruct	cions: Step 1: Circle Yes or No and fill in with requested information			
T4	Step 2: Explain all "No" responses at the bottom of the check	H		C
Item	Task Description	Resi	oonse	Comment:
1	Delivery Book Model Verification	Cubmitted	Dolivanad	
A	Manufacturer	Submitted	Delivered	
2	Model		 	
3	Serial number	N/A	 	
4	Cooling Capacity (MBH/gpm)	IN/A	 	
5	Fan speed / power (rpm / hp)			
6	Motor Power and Speed (hp / rpm)			
7	Motor Voltage / Phase / Frequency (V / - / Hz)			
B	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	The air openings are sealed with plastic	Yes	No	
3	The water openings are sealed with plastic plugs	Yes	No	
4	All components present (fans, pumps, fill, etc)	Yes	No	
5	All access doors are operable	Yes	No	
6	Installation and startup manual provided	Yes	No	
7	Unit tags affixed	Yes	No	
2	Construction checklist	103	110	
A	Installation of Cooling Tower			
1	Unit secured as required by manufacturer and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
	Unit location is clear of trees, rubbish, dust, etc. to prevent	Yes	No	
4	fouling			
5	Vibration isolators installed and in good condition	Yes	No	
6	Ladder reached grade level	Yes	No	
7	Unit labeled and is easy to see	Yes	No	
В	Piping			
1	All piping components have been installed (in the correct order) as required by detail drawings	Yes	No	
2	Piping arranged for ease of unit removal	Yes	No	
3	Piping supported as required by specifications	Yes	No	
4	Piping is clean	Yes	No	
5	Makeup water supply provided	Yes	No	
6		Yes	No	
7	Valve tags attached	Yes	No	
8	Piping insulation complete and installed as per specifications	Yes	No	
0	Tiping institution complete and instance as per specifications	103	NO	
Contac	tor: LAW	A Representa	ative:	
		•		
Checks		s by:		Date:
	issioning			
Agency		_		_
Checks		s by:		
	Print name Signature	Print naı	me Sign	ature



LAWA Commissioning Forms Cooling Tower (Continued)

Instruct	ions: Step 1: Circle Yes or No and fill in with requested information				
Itom	Step 2: Explain all "No" responses at the bottom of the check! Task Description		esponse	Comment:	
Item C	Electrical		esponse	Comment:	
1	Local disconnect installed in an accessible location	Yes	No		
2	Fan motor rotation in the proper direction	Yes	No		
3	All electrical connections are tight	Yes	No		
4	All electrical components grounded	Yes	No		
5	VFD installed (if applicable)	Yes	No		
D	Controls - Installation	105	110		
1	Control panel accessible and labeled properly	Yes	No		
2	All sensors (temperature, pressure, etc) are installed and	Yes	No		
_	calibrated verified	105	110		
3	Valve actuators installed and calibration verified	Yes	No		
4	Safety items installed and verified (low water, high water, etc)	Yes	No		
E	Controls - Startup				
1	Sequence of control verified	Yes	No		
2	High / low water alarms operational	Yes	No		
3	VFD operational	Yes	No		
4	Float switch, motorized valves, makeup water are operational	Yes	No		
F	Mechanical - Startup				
1	Tower basin filled	Yes	No		
2	Sump strainers and nozzles are clean	Yes	No		
3	Motors and gear box lubricated	Yes	No		
4	Fan pitch adjusted	Yes	No		
5	Critical frequencies identified, recorded, and programmed out of VFD	Yes	No		
6	System start and runs without any unusual noise or vibration	Yes	No		
7	Manufacturer's startup checklist completed and attached	Yes	No		
G	Water treatment - Startup				
1	Galvanized surfaces passivated (if applicable)	Yes	No		
2	Conductivity and pH controls operational	Yes	No		
3	Makeup flow meter signal operational	Yes	No		
4	Blow – down control operational	Yes	No		
5	No – flow injection interlock operational	Yes	No		
Contac	tor: LAW	A Represe	entative:		
Checks	by: Date:; Checks	by:		Date:	
	ssioning	<i>-</i>			
Agency	e				
		by:		Date:	
	Checks by: Date:; Checks by: Date: Date:				



Cooling Tower (Continued)

Instruct	tions: Step 1: Circle Yes or No and fill in with requested informati Step 2: Explain all "No" responses at the bottom of the chec			
Item	Task Description		Response	Comment:
H	TAB		Copone	Comment
1	Unit is free of unusual noise or vibration	Yes	No	
2	Motor overloads verified	Yes	No	
3	Motor rotation verified – each motor	Yes	No	
4	Motor voltage and amps verified - each phase of each motor	Yes	No	
5	Flow rate through tower verified	Yes	No	
6	Water distributed evenly in hot water basin with flow at 50% - no dumping	Yes	No	
7	Water distributed evenly in hot water with flow at 100%	Yes	No	
"NO"]	Responses:			
Item	Date	Reason	for "NO" respon	ises
		_		
		_		
		_		
Contac	etor: LAV	VA Represe	entative:	
Checks	by: Date:; Check	s hv		Date:

Print name

Signature

Commissioning Agency:
Checks by:

Date: _____; Checks by:

Signature

Print name



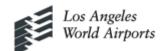
LAWA Commissioning Forms Coil, HW Heat

Instruct	tions: Step 1: Circle Yes or No and fill in with requested information			
T ,	Step 2: Explain all "No" responses at the bottom of the checkl			
Item	Task Description	Resp	ponse	Comment:
1	Delivery Book	6.1	D 11 1	
<u>A</u>	Model Verification	Submitted	Delivered	
1	Manufacturer Model	 	—	
2	Model	NT/A		
3	Serial number	N/A	—	
4	Equipment or Area Served	<u> </u>	 	
5	Heating Capacity (MBH/gpm)	∦ <i>/.</i> '	 	
6 D	Piping Inlet / Outlet Diameter (in.)	<u> </u>	1/	
B	Physical Checks	 	 	
1	Unit is free from physical damage	Yes	No	
2	The water openings are sealed	Yes	No	
3	Installation and startup manual provided	Yes	No	
4	Unit tags affixed	Yes	No	
5	Manufacturer's rating readable/accurate	Yes	No	
2	Construction checklist	1		
A	Installation of Reheat Coil	1		
1	Unit secured as required by specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Unit labeled and is easy to see	Yes	No	
В	Piping			
1	All piping components have been installed (in the correct order)	Yes	No	
	as required by detail drawings	<u> </u> '		
2	Piping arranged for ease of unit removal	Yes	No	
3	Piping supported as required by specifications	Yes	No	
4	Piping is clean	Yes	No	
5	Piping insulation complete and installed as per specifications	Yes	No	
6	All valves and test ports are easily accessible	Yes	No	
7	Valve tags attached	Yes	No	
		<u> </u>		
		['		
		<u> </u>		
		<u> </u>		
		·		
		<u> </u>		
Contac	tor: LAW	A Representa	ative:	
Chaoke	1 Data: Chacks	1		Data.
Commi	by: Date:; Checks issioning	by:		Date:
Agency				
		. h		Data
CHECKS	by: Date:; Checks	Print na	me Signs	Date



LAWA Commissioning Forms Coil, HW Heat (Continued)

Instructions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the checklist							
Item	Task Description			ponse	Comment:		
C	Controls		1105				
1	Temperature sensor calibration verified		Yes	No			
2	Hot water actuator calibration verified		Yes	No			
3	Point-to-point connections of control wiri	ng verified	Yes	No			
4	Central system accurately represents cond		Yes	No			
5	Heating sequence of control verified		Yes	No			
D	TAB						
1	Entering and leaving coil air temperature	()	/	/			
2	Entering and leaving coil water temperatu		/	/			
3	Coil flow and air /water pressure drops ve		Yes	No			
	•						
"NO" I	"NO" Responses:						
Item	Date		Reason for	"NO" Respon	nse		
Contac	tor:	LAWA	A Represent	ative:			
Checks	by:	Date: • Checks	hv·		Date:		
	issioning	, Checks	~ <i>J</i> •				
Agency							
	by:	Date: : Checks	bv:		Date:		
	Print name Signature	, encons	Print na	me Si	ignature		



Ductwork: Installation

Instructions: Step 1: Circle Yes or No and fill in with requested information

Step 2: Explain all "No" responses at the bottom of the checklist

Step 3: Samples of installed ductwork will be periodically reviewed to verify compliance

Item	Task Description	Resi	oonse	Comment:
1	System Checks	•		
A	Sheet Metal Ductwork Installation Checks	Submitted	Delivered	
1	Ductwork is clean and free of damage prior to installation.	Yes	No	
2	Ductwork is installed in accordance with SMACNA HVAC Duct Construction Standards, 2005	Yes	No	
3	All hat sections and standoff brackets are at the same height as the duct lining.	Yes	No	
4	Access doors are installed in all casting, plenums, ductwork adjacent to fire dampers, automatic dampers, smoke dampers, and reheat coils, and as indicated on drawing.	Yes	No	
5	The access doors on casings or housings open to the inside on the discharge side and to the outside on the suction side.	Yes	No	
6	All galvanized sheet metal is separated from aluminum and copper with lead or felt gaskets.	Yes	No	
7	Ductwork is structurally sound to prevent drumming and sagging.	Yes	No	
8	All transverse and longitudinal joints are sealed	Yes	No	
9	All branch the tee connections are 45 degree.	Yes	No	
10	All medium pressure branch and tee connections are expanded 30 degrees on at least three sides.	Yes	No	
11	Ductwork meets static pressure requirements specified below and leakage class A for these pressures as defined by SMACNA HVAC Duct Construction Standards, 1985	Yes	No	
12	All ductwork except as noted in the specification is leak tested.	Yes	No	
13	Elbows have an inside radius equal to a minimum of ¾ of the width if the duct	Yes	No	
14	All square elbows and radius elbows larger than 18 inches have turning vanes	Yes	No	
15	All wall and floor penetrations are sealed	Yes	No	
16	Volume dampers are at minimum provided for each horizontal branch from vertical risers serving two or more floors and branches serving two or more outlets	Yes	No	
17	All equipment requiring maintenance is accessible (valves, junction boxes, etc.)	Yes	No	
18	All duct openings temporary sealed to maintain duct system cleanliness.	Yes	No	
19	Record drawings have been updated to reflect any changes made.	Yes	No	
		Yes	No	

Contactor:					
Checks by:Commissioning		_ Date:	; Checks by:		Date:
Agency: Checks by: Print nar	ne Signature	_ Date:	; Checks by:Print name	Signature	Date:

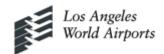


Ductwork: Installation (Continued)

Instructions: Step	1: Circle	Yes or No and	fill in with rec	quested information
--------------------	-----------	---------------	------------------	---------------------

Step 2: Explain all "No" responses at the bottom of the checklist Step 3: Samples of installed ductwork will be periodically reviewed to verify compliance

	step 3. Samples of instance ductivors will be periodically fevile	wed to verify	compilance			
Item	Task Description	Rest	oonse	Comment:		
1	System Checks					
В	Flexile Ductwork Installation Checks	Submitted	Delivered			
1	Flexible ductwork is clean and free from damage prior to installation	Yes	No			
2	Flexible ductwork is free of sags and kinks.	Yes	No			
3	Flexible ductwork is installed using extra heavy flexible duct straps	Yes	No			
4	The maximum length of flexible ductwork is 5 feet	Yes	No			
5	Flexible ductwork does not penetrate walls	Yes	No			
6	Flexible ductwork does not have 90 degree bends.	Yes	No			
C	Ductwork Type Static Pressure Classification Installation Checks					
1	From fan discharge to and including vertical risers, +6 in. static pressure	Yes	No			
2	Branch supply ductwork, +4 in. static pressure.	Yes	No			
3	Branch supply ductwork from terminal to room outlet, +1 in. static pressure.	Yes	No			
4	Exhaust/return ductwork, ± 1 in. static pressure	Yes	No			
5	All other ductwork, ± 2 in. static pressure	Yes	No			
Item	Date	Reason for "I	NO" Response			
Contac	Contactor: LAWA Representative:					
Checks		y:		Date:		
Agency	issioning					
Checks		v.		Date		
CHECKS	Print name Signature, Checks by	Print name		cure		



Ductwork: Installation- Daily Checklist

Checklist for Daily Progress

- Instructions: Step 1: This form is completed daily by each work crew at the end of their shift, indicate crew/shift designation.
 - Step 2: Date and describe work completed in the appropriate section (1 for pre-installation and 2 for installation.
 - Step 3: verify achievement of quality requirements by circling "Yes" or "No". For negative responses, complete Section 3

1. Pre-insulation inspection by installer

Date Description of Work Performed		Checklist Items			Percent	Initial
Date	(relate to drawings and number)	A. Clean	B. Flex	C. Less 5'	Complete	
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		

- A. Ductwork is clean and free of damage prior to installation.
- B. Flexible ductwork is clean and free of damage prior to installation.
- C. The maximum length of flexible ductwork is 5'.

2. Installation of Insulation Checklist by installer

	Description of Work Performed	Description of Work Performed Checklist Iten			Percent	Initial
Date	(relate to drawings and drawing number)	Α.	В.	C. Assess	Complete	
		SMACNA	Drumming	Doors		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		

- A. Ductwork is installed in accordance with SMACNA HVAC Duct Construction Standards, 2005.
- B. Ductwork is structurally sound to prevent drumming and sagging.
- C. All required access doors installed.

3. Conflicts (Attach sketches or other documentation, including resolutions support; all items in section 1 and 2 to be noted in this section. In addition, any conflicts or non-compliance of any items on the general checklist (Checklist Number 7A) or items not on the checklist should be noted in this section. If Cx Team determines it is significant issues, items will be added to the daily checklist

Date	Description of Conflict	Resolution or Suggested Resolution	Resolved
			Yes/No

Contactor:			LAWA Representative:		
Checks by: Commissioning		Date:	; Checks by:		Date:
Agency: Checks by: Print name	Signature	Date:	; Checks by: Print name	Signature	Date:



Ductwork: Insulation

Instructions: Step 1	Circle Yes or N	No and fill in with re	equested information
----------------------	-----------------	------------------------	----------------------

- Step 2: Explain all "No" responses at the bottom of the checklist Step 3: Samples of installed ductwork will be periodically reviewed to verify compliance

Item	Task Description Response		onse	Comment:
1	System Checks			
A	Installation Checks	Submitted	Delivered	
1	Ductwork is clean, dry and free of damage prior to insulation	Yes	No	
	installation.			
2	Insulation is clean and dry during installation and application of	Yes	No	
	any finish			
3	Pressure and leakage tests performed and reports have been	Yes	No	
3	submitted prior to insulation installation.			
4	All equipment requiring maintenance is accessible (valve, junction	Yes	No	
	boxes, etc.)			
	Insulation is continuous through openings and sleeves in mom-	Yes	No	
5	rated construction, and is butted tightly against the fire stop with			
	butt joints taped in rated construction.			
6	All insulation edges temporary sealed to maintain duct insulation	Yes	No	
	cleanliness			
7	Insulation is removable at access panels with metal corner beads.	Yes	No	
8	Insulation omitted at all equipment name plates and/or data plates	Yes	No	
	All outdoor intakes, housing, plenums from point of entry into the	Yes	No	
9	building to the fan or supply discharge and to exhaust duct from			
	damper to outside and elsewhere be indicated on drawings are			
	insulated with 1 ½ inch rigid insulation board w/ vapor barrier			
	All exposed conditioned supply ductwork within the building is	Yes	No	
10	insulated with 1 inch thick rigid insulation board with vapor			
	barrier			
	All non flexible ductwork insulation is fastened by applying Foster	Yes	No	
11	No. 85-20 adhesive in 4-inch wide continuous bands on 120inch			
	centers and further secured by welded mechanical pins applied on			
	12-inch centers as specified.			
	All concealed flexible and round ductwork is insulated with 1 ½	Yes	No	
12	inch thick insulation and secured by the means of metal staples			
12	using the stitching methods of application an das detailed in the			
	specifications.			
13	All exterior corners are sealed with a 5-inch wide tape	Yes	No	

Contactor:				LAWA R	Representative:		
Checks by:			Date:;	; Checks by:	:		Date:
Commissioning Agency:							
Checks by:			Date:;	; Checks by:	, 		Date:
Prin	t name	Signature			Print name	Signature	



Ductwork: Insulation (Continued)

Instruc	tions: Step 1: Circle Yes or No and fill in with requested information			
	Step 2: Explain all "No" responses at the bottom of the check Step 3: Samples of installed ductwork will be periodically rev		aomnlianaa	
	Step 3. Samples of instaned ductwork will be periodically fer	viewed to verify	compnance	
Item	Task Description	Resi	oonse	Comment:
1	System Checks			
В	Installation checks – Flexible Ductwork	Submitted	Delivered	
1	Flexible ductwork is clean and free from damage prior to installation	Yes	No	
2	Flexible ductwork is free of sags and kinks.	Yes	No	
3	Flexible ductwork is installed using extra heavy flexible duct straps	Yes	No	
4	The maximum length of flexible ductwork is 5 feet	Yes	No	
5	Flexible ductwork does not penetrate walls	Yes	No	
6	Flexible ductwork does not have 90 degree bends.	Yes	No	
(7704)	Responses:		<u> </u>	
Item	Date	Reason for "I	NO" Response	
Q .				
Contac	ctor: LAW	A Representati	ve:	
Comm	by:; Checks issioning	s by:		Date:
Agency	y: s by:	, hv.		Date:
CHECKS	. by Date, Checks	o o y		Daw

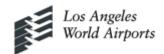
2

Print name

Signature

Ductwork: Insulation

Print name



Ductwork: Insulation- Daily Checklist

Checklist for Daily Progress

- Instructions: Step 1: This form is completed daily by each work crew at the end of their shift, indicate crew/shift designation.
 - Step 2: Date and describe work completed in the appropriate section (1 for pre-installation and 2 for installation.
 - Step 3: verify achievement of quality requirements by circling "Yes" or "No". For negative responses, complete Section 3

1. Pre-insulation inspection by installer

	Description of Work Performed		Checklist Items			Initial
Date	(relate to drawings and number)	A. Clean	B. Leak	C. Material	Complete	
			Tested			
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		

- A. Ductwork is clean or cleaned before insulation installed.
- B. All sections leak tested prior to applying insulation.
- C. Insulation material inspected to assure it had not been damaged.

2. Installation of Insulation Checklist by installer

	Description of Work Performed	Checklist Items			Percent	Initial
Date	(relate to drawings and drawing number)	Α.	B. Sealed	C. Vapor	Complete	
		Thickness		Barrier		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		

- A. Insulation thickness checked against project manual and is correct.
- B. All flex duct installed per drawing and no runs more than five feet.
- C. All vapor barriers installed.

3. Conflicts (Attach sketches or other documentation, including resolutions support; all items in section 1 and 2 to be noted in this section. In addition, any conflicts or non-compliance of any items on the general checklist (Checklist Number 8A) or items not on the checklist should be noted in this section. If Cx Team determines it is significant issues, items will be added to the daily checklist

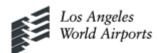
Date	Description of Conflict	Resolution or Suggested Resolution	Resolved
			Yes/No
			Yes/No
			Yes/No

Contactor:			LAWA Representative:		
Checks by:Commissioning		Date:	; Checks by:		Date:
Agency: Checks by: Print name	Signature	Date:	; Checks by:Print name	Signature	Date:



LAWA Commissioning Forms Operations and Maintenance: Energy Efficiency Checklist

	Operations and Manite	nance. Energy En	incicincy Cir	CCKIISt	
Instruct	ions: Step 1: Circle Yes or No and fill in with reque				
	Step 2: Explain all "No" responses at the bottom	om of the checklist			
Item	Task Description		Resp	onse	Comment:
1	Owner's Project Requirements		1		
A	Energy Efficiency Goal: Less than 20,000 kWh/ month, 35 kW, and 120 therms	Record Actual Usage	Was OPR	Achieved?	
1	Actual kWh		Yes	No	
2	Actual kW		Yes	No	
3	Actual therms		Yes	No	
В	System Manual and Building Documentation	Provide appropriate document		system meet OPR?	
1	Have changes been made to the energy control hardware this month?		Yes	No	
2	Have software change been made, such as schedule or sequences?		Yes	No	
3	Has the Systems Manual been updated?		Yes	No	
4	Have changes been made to the drawings and schedules?		Yes	No	
5	Has the commissioning team or commissioning authority been involved?		Yes	No	
6	Has the optimization in section 24 of the System Manual implemented this month?		Yes	No	
C	General Owner's Needs				
1	Are there any unresolved punchlist items related open? If so, list the number	to energy efficiency	Yes	No	
2	Was Elementary Control Services required to resolution efficiency related issues this month?	lve any energy	Yes	No	
3	Where the seasonal control checks in Section 88 of implemented?	of the System Manual	Yes	No	
4	Are there any conflicts with user' needs and energ	y efficiency?	Yes	No	
5	Was a commissioning optimization workshop held	d this month?	Yes	No	
				-	
Contac	tor:	LAWA Rep	resentative:		
	issioning	; Checks by:			_ Date:
Checks	by: Date:	; Checks by:			_ Date:
	Print name Signature	P	rint name	Signature	



Operations and Maintenance: Energy Efficiency Checklist

	tions: Step 1: Circle Yes Step 2: Explain all					
"YES"	or "NO" Responses:			"	"	
T.	1	T.		T I I II //X/EGN D	10 11 0	6 ((2101)
Item		Item		Explain all "YES" Resp	Responses	eason for "NO"
				III		
Contac	etor:			LAWA Representati	ve:	
Checks	by:		_ Date:	LAWA Representati _; Checks by:		Date:
Checks Commi	by: issioning 7:			; Checks by:		
Checks Commi	by: issioning 7:			-		



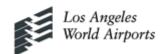
LAWA Commissioning Forms Energy Recovery Wheel

Instruct	Step 2: Explain all "No" responses at the bottom of the check			
Item	Task Description	Tr.	oonse	Comment:
1	Delivery Book	1100		0 0 1111101100
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial number	N/A		
4	Exhaust air flow (cfm)			
5	Supply air flow (cfm)	/	/	
6	Voltage / Phase / Frequency (V/ _/Hz)	/	/	
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	The air openings are sealed with plastic	Yes	No	
3	All components present and in proper order	Yes	No	
4	All access doors are operable	Yes	No	
5	Installation and startup manual provided	Yes	No	
6	Unit identification attached and visible	Yes	No	
2	Construction checklist			
A 1	Installation of Energy Recovery Wheel Unit secured as required by manufacturer and specifications	Yes	No	
1 2	Purge section in correct direction	Yes	No	
3	Adequate clearance around unit for service	Yes	No	
4	All components accessible for maintenance	Yes	No	
5	Unit can be removed from building	Yes	No	
6	Unit identification attached and visible	Yes	No	
В	Electrical			
1	Local disconnect installed in an accessible location	Yes	No	
2	Wheel rotation in the proper direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	
5	VFD installed (if applicable)	Yes	No	
Contac	tor: LAW	A Representa	itive:	
Checks	by: Date:; Check	s hv·		Date:
	by: Date:; Check ssioning	<u>.</u>		Duic
Agency	e			
Checks		s by:		Date:
	Print name Signature	Print nar	ne Signa	ature



LAWA Commissioning Forms Energy Recovery Wheel (Continued)

Instruct	Step 2: Explain all "No" responses at the bottom of the checkly			'
Item	Task Description		Response	Comment:
C	Ductwork Task Description		esponse	Comment.
1	Duct work is attached according to manufacturer	Yes	No	<u> </u>
*	recommendations	103	110	
2	Inlets and outlets of energy recovery wheel are free of ductwork	Yes	No	
-	blockage.	105	110	'
3	Structural support for ductwork is independent of wheel unit	Yes	No	<u> </u>
4	Ductwork placement allows unrestricted airflow and clear view	Yes	No	<u> </u>
·	of rotation labeling	105		'
5	Access doors have been supplied in each duct near the unit	Yes	No	
6	Adequate locations for testing and balancing of unit	Yes	No	(·
7	All dampers and sensors are accessible (access doors)	Yes	No	1
8	Ductwork is clean and free of debris	Yes	No	1
D	Controls – installation			<u> </u>
1	Control panel accessible and labeled properly	Yes	No	1
2	Temperature, pressure, and CO ₂ sensors (as applicable) are	Yes	No	
	installed and calibrated			'
3	Safety items installed and verified (freezestat, high pressure,	Yes	No	
	motor overload, etc)			1
E	Mechanical – startup			1
1	System clean	Yes	No	
2	Wheel lubricated and aligned	Yes	No	1
3	Wheel belts have proper tension and are in good condition	Yes	No	1
4	Seals have been adjusted according to manufacturer	Yes	No	1
	specifications			
5	Duct installation conforms to airflow labeling	Yes	No	1
6	System starts and runs without any unusual noise or vibration	Yes	No	1
7	Manufacturer's startup checklist completed and attached	Yes	No	
F	Control – Startup			
1	Warm-up sequence of control verified	Yes	No	1
2	Cool-down sequence of control verified	Yes	No	1
3	Economizer sequence of control verified	Yes	No	1
4	Unoccupied sequence of control verified	Yes	No	
	Onoccupied bequence of contrat value	100		1
		 		1
 		 		1
		 		(
		 		
i		 		
C =:404	· TAYV	7 A D mag		
Contac	tor:	'A Represe	entative:	
Checks	by: Date:; Checks	a hw		Date:
	issioning Date, Checks	υу		Datc
Agency	8			ı
	by: Date:; Checks	hw.		Date:
Ciicoiii	Print name Signature	Print	name S	Signature



Energy Recovery Wheel (Continued)

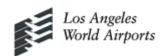
Instruct	tions: Step 1: Circle Yes or No and fill in with requested informatio			
Item	Step 2: Explain all "No" responses at the bottom of the check Task Description		Dagnanga	Comment:
G	TAB	1	Response	Comment:
1	Motor voltage and amps verified	Yes	No	
2	Wheel speed, design/ actual (rpm)	Yes	No	
3	Pressure drop between outside air and return air is large enough	Yes	No	
	Tressure drop between outside an and retain an is large shough	105		
\sqcap		1	-	
		1		
		1		
		1		
"NO"	Responses:			
Item	Date	Reason	for "NO" Respon	ise
		1	•	
		1		
		1		
		1		
		1		
Contac	tor: LAW	A Represo	entative:	
Checks	s by: Date:; Checks	s by:		Date:
Comm	issioning	05		
Agency				
	s by: Date:; Checks	s by:		Date:

Print name

Signature

Print name

Signature



LAWA Commissioning Forms Exhaust Fan

msuuci	Step 2: Explain all "No" responses at the bottom of the chec			
Item	Task Description	- 1	oonse	Comment:
1	Delivery Book	1105		
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial number	N/A		
4	Fan type	1,11		
5	Capacity / Static Pressure (cfm / in.wg)	/	/	
6	Motor Power / Speed (hp/rpm)	/	/	
7	Motor Voltage / Phase / Frequency (V/ - / Hz)	/	/	
В	Physical Checks	,	,	
1	Unit is free from physical damage	Yes	No	
2	The air openings are sealed with plastic	Yes	No	
_	All components present (belt guard, motor, damper, spring	Yes	No	
3	isolators, etc.)			
4	Installation and startup manual provided	Yes	No	
5	Unit tags affixed	Yes	No	
2	Construction checklist			
A	Installation of Exhaust Fan			
1	Unit secured as required by manufacturer and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Shipping bots have been removed (if applicable)	Yes	No	
6	Belts are tight (if applicable)	Yes	No	
7	Back draft damper installed and moves freely	Yes	No	
8	Protective shrouds for fan and belts in place and secure	Yes	No	
9	Unit labeled and is easy to see	Yes	No	
В	Ductwork			
1	Adequate locations available for testing and balancing unit	Yes	No	
2	All dampers and sensors are accessible (access panels)	Yes	No	
3	Vibration isolators installed	Yes	No	
4	All dampers close tightly and stroke fully and easily	Yes	No	
5	Ductwork is clean and free of debris	Yes	No	
С	Electrical			
1	Safety disconnect installed in an accessible location	Yes	No	
2	Motor rotation is in correct direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	
Contac	1 9	WA Representa		
Contac	LA	TA Represent	11116.	
Checks	by:; Checl	ks bv:		Date:
	ssioning	- J -		
Agency				
Checks		ks by:		Date:
	Print name Signature	Print nar		ature



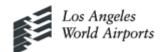
LAWA Commissioning Forms Exhaust Fan (Continued)

Instructions: Step 1: Circle Yes or No and fill in with requested information						
T4	Step 2: Explain all "No" responses at the bottom of the check					
Item	Task Description	K	esponse	Comment:		
D	Controls – installation	7.7	N.			
1	Control panel accessible and labeled properly	Yes	No			
2	Dampers actuators installed and calibration verified	Yes	No			
3	Safety items installed and verified (high pressure, motor overload, etc)	Yes	No			
E	Mechanical – startup					
1	Unit is clean	Yes	No			
2	Internal isolators free to move	Yes	No			
3	Fan and motor lubricated and aligned	Yes	No			
4	Fan belts have proper tension and are in good condition (if applicable)	Yes	No			
5	System starts and runs without any unusual noise or vibration	Yes	No			
6	Manufacturer's startup checklist completed and attached	Yes	No			
F	Control – Startup	168	NO			
1 1	Remote start/stop from central system verified	Yes	No			
2		Yes				
	Sequence of control is correct TAB	res	No			
G		37	NI.			
1	Air flow, design / actual (cfm)	Yes	No			
2	Pressure drop, design / actual (in. wg)	Yes	No			
3	Fan rotation is in proper direction	Yes	No			
4	Motor overloads verified	Yes	No			
5	Motor voltage and amps verified – each phase	Yes	No			
"NO" Responses:						
Item	Date	Reason	for "NO" Respor	nse		
Contac	tor: LAW	A Represe	entative:			
Checks	by: Date:; Check	s by:		Date:		
	issioning	· J ·				
Agency						
Checks		s by:		Date:		
	Print name Signature			gnature		



LAWA Commissioning Forms Fan Coil Unit, CW & HW

Instruct	tions: Step 1: Circle Yes or No and fill in with requested information			
Item	Step 2: Explain all "No" responses at the bottom of the checkles Task Description		ponse	Comment:
1	Delivery Book	Kesp	Jonse	Comment.
A	Model Verification	Submitted	Delivered	
A 1	Manufacturer	Suommaca	Denvered	
2	Model	 	-	
3	Serial number	N/A	-	
4	Capacity / Static Pressure (cfm / in. wg)	14/11	-	
5	Fan Motor Power (hp)	/	 	
6	Fan Motor Voltage / Phase / Frequency (V/ _ / Hz)		'	
7	Total / Sensible Cooling Capacity (MBH)	//	1/	
8	Cooling Fluid Flow / Pressure Drop (gpm / ft.wg)		'	
9	Total Heating Capacity (MBH)	 	1	
10	Heating Fluid Flow / Pressure Drop (gpm / ft. wg)	/	1/	
B	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	Coil surface areas are free of damage	Yes	No	
3	The water openings are sealed with plastic plugs	Yes	No	
4	All components present	Yes	No	
5	Installation and startup manual provided	Yes	No	
6	Unit tags affixed	Yes	No	
2	Construction checklist			
A	Installation of Fan Coil Unit			
1	Unit supported using adequately sized mounting anchors	Yes	No	
2	Metal-to-metal connections eliminated to prevent noise	Yes	No	
ļ	problems	- \		
3	Adequate clearance around unit for service	Yes	No	
4	All components are accessible for maintenance	Yes	No	
5	Unit can be removed from building	Yes	No	
6	Unit labeled and is easy to see	Yes	No	
В	Chilled Water Piping			
1	Condensate piping properly installed (trapped and run to a drain)	Yes	No	
2	P/T ports installed across the cooling coil	Yes	No	
3	All piping components have been installed (in the correct order)	Yes	No	
	as required by detail drawing	<u> </u>		
4	Piping arranged for ease of unit/coil removal	Yes	No	
5	Piping supported as required by specifications	Yes	No	
6	Piping is clean	Yes	No	
7	Piping insulation complete and installed as per specifications	Yes	No	
8	All valves and test ports are easily accessible	Yes	No	
	Valve tags attached	Yes	No	
Contac	tor: LAW	A Representa	ative:	
		•		
	by:; Checks	by:		Date:
	issioning			
Agency		_		~
Checks	by: Date:; Checks	by:	Cion	Date:



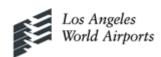
LAWA Commissioning Forms Fan Coil Unit, CW & HW (Continued)

Instructions: Step 1: Circle Yes or No and fill in with requested information				
	Step 2: Explain all "No" responses at the bottom of the check	1		
Item	Task Description	R	esponse	Comment:
С	Hot Water Piping			
1	All piping components have been installed (in the correct order)	Yes	No	
	as required by detail drawing	<u> </u>		
2	Piping arranged for ease of unit/coil removal	Yes	No	
3	Piping is supported as required by specifications	Yes	No	
4	Piping is clean	Yes	No	
5	Piping insulation complete and installed as per specifications	Yes	No	
6	All valves and test ports are easily accessible	Yes	No	
7	Valve tags attached	Yes	No	
D	Ductwork			
1	Adequate location available for testing and balancing of unit	Yes	No	
2	All dampers and sensors are accessible (access doors)	Yes	No	
3	All dampers close tightly and stroke fully and easily	Yes	No	
4	Filter is clean	Yes	No	
5	Filter is properly installed (air bypassing the filter is prevented)	Yes	No	
6	Ductwork is clean and free of debris	Yes	No	
E	Electrical			
1	Local disconnect installed in an accessible location	Yes	No	
2	Motor rotation in the proper direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	
F	Controls – Installation			
1	Control panel accessible and labeled properly	Yes	No	
2	Room thermostat installed and calibration verified	Yes	No	
3	Chilled and hot water actuators installed and calibration verified	Yes	No	
G	Control – Startup	105	110	
1	Unit operation accurately represented on main system	Yes	No	
2	Cooling sequence of control verified	Yes	No	
3	Heating sequence of control verified	Yes	No	
	Treating sequence of control vertice	103	110	
		-		
		-	$-\parallel$	
Contac	tor: LAW.	A Represe	ntative:	
	by: Date:; Checks	by:		Date:
	issioning			
Agency				5
Checks	by:; Checks	by:		Date:
	Print name Signature	Print :	name S	ignature



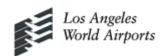
LAWA Commissioning Forms Fan Coil Unit, CW & HW (Continued)

Instruct	tions: Step 1: Circle Yes or No and fill in with requested in			
Item	Step 2: Explain all "No" responses at the bottom of the Task Description		lesponse	Comment:
H	TAB	N	esponse	Comment:
1	Filters and coils are clean	Yes	No	
2	Motor rotation verified	Yes	No	
3	Motor overloads verified	Yes	No	
4	Motor voltage and amps verified – each phase	Yes	No	
5	Entering and leaving cooling coil air temperature()	Yes	No	
	Entering and leaving cooling coil air temperature() Entering and leaving heating coil air temperature()	Yes	No	
6				
7	Entering and leaving chilled water temperature ()	Yes	No	
8	Entering and leaving hot water temperature ()	Yes	No	
9	Coil flow and air/water pressure drops verified – each coil	il Yes	No	
"NO"]	Responses:			
	•			
Item	Item		Reason for	r "NO" Response
Contac	etor:	LAWA Represe	entative:	
CI. I	To a second seco	Ch 1 . 1		Det
Checks		Checks by:		Date:
	issioning			
Agency		C1 1 1		-
Checks				Date:
	Print name Signature	Print	name	Signature



LAWA Commissioning Forms Fire Damper

Instructions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the checklist				
Item	Task Description		oonse	Comment:
1	Delivery Book	Kes	Jonse	Comment.
A	Model Verification	Submitted	Delivered	
1	Manufacturer	Submitted	Delivered	
2	Model			
3	Style	N/A		
4	Width (in.)	11/74		
5	Height (in.)	/	/	
6	Orientation	/	//	
В	Physical Checks	,	,	
1	Unit is free from physical damage	Yes	No	
2	All components/accessories present	Yes	No	
3	Installation manual provided	Yes	No	
2	Construction checklist	103	140	
A	Installation of Fire Damper			
1	Unit secured as required by manufacturer and specification	Yes	No	
2	Adequate clearance around unit for maintenance	Yes	No	
3	Unit mounted in correct orientation	Yes	No	
	Out mounted in correct orientation	103	110	
"NO" l	Responses:			
Item	Item		Reason for "NO	O" Response
Contac	tor: LAV	VA Representa	ative:	
	by: Date:; Check issioning	xs by:		Date:
Checks	by: Date:; Check			Date:
	Print name Signature Print name Signature			



Grilles, Registers & Diffusers

Instruct	ions: Step 1: Circle Yes or No and fill in with requested informat			
Item	Step 2: Explain all "No" responses at the bottom of the che Task Description		oonse	Comment:
1	Delivery Book	Kesj	Jonse	Comment:
A	Model Verification	Submitted	Delivered	
1	Manufacturer	Submitted	Delivered	
2	Model			
3	Frame		1	
4	Color		1	
5	Neck Width (in.)	/	/	
6	Neck Height (in.)	/	/	
В	Physical Checks	,	,	
1	Unit is free from physical damage	Yes	No	
2	All components/accessories present	Yes	No	
3	Installation manual provided	Yes	No	
2	Construction checklist	103	140	
A	Installation of Grilles / Register			
1	Unit secured as required by manufacturer and specification	Yes	No	
2	Any surface blemishes have been touched up	Yes	No	
3	Design CFM confirmed	Yes	No	
	Design of M commined	105	110	
			1	
			1	
			1	
"NO" l	Responses:			
Item	Item		Reason for "N(O" Response
Contac	tor: LA	WA Representa	ative:	
Checks Commi	issioning	ks by:		Date:
Checks	by:; Chec	ks by:		Date:
	Print name Signature	Print naı	me Signa	ature



LAWA Commissioning Forms Humidifier, Steam

Instruct	tions: Step 1: Circle Yes or No and fill in with requested information			
 1	Step 2: Explain all "No" responses at the bottom of the checkl			
Item	Task Description	Resp	ponse	Comment:
1	Delivery Book	1	,	
A	Model Verification	Submitted	Delivered	
1	Manufacturer	 '	—	
2	Model	<u> </u>	—	
3	Serial number	N/A	—	
4	Steam Output Capacity (lb/hr)	 '	┦	
5	Steam Input Capacity (lb/hr)		/	
6	Inlet Steam Maximum Pressure (psig)	<u> </u>		
В	Physical Checks	_		
1	Unit is free from physical damage	Yes	No	
2	All components present	Yes	No	
3	Installation and startup manual provided	Yes	No	
4	Unit tags affixed	Yes	No	
2	Construction checklist			
A	Installation of Humidifier			
1	Unit secured as required by manufacturer and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components are accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Unit located below duct level for good drainage	Yes	No	
6	Dispersion tube located as per manufacturer's recommendations	Yes	No	
7	Unit labeled and is easy to see	Yes	No	
В	Piping			
	All piping components have been installed (in the correct order)	Yes	No	
1	as required by detail drawing.			
2	Piping arranged for ease of unit removal	Yes	No	
3	Piping sloped for complete drainage	Yes	No	
4	Piping supported as required by specifications	Yes	No	
5	Piping is clean and free from leaks	Yes	No	
6	All valves and test ports are easily accessible	Yes	No	
7	Valve tags attached	Yes	No	
C	Controls - Installation		11.5	
1	Air flow sensor installed and calibration verified	Yes	No	
2	Duct high limit humidistat in stalled and calibration verified	Yes	No	
-	Duct mgn mint numursut in stance and cancerate.	103	140	
	<u> </u>	 	 	
	<u> </u>	 		
	<u> </u>	<u></u>	<u> </u>	
Contac	tor:	A Representa	ative:	
Chaoke	Data: Chacks	t		Data
Comm	by: Date:; Checks issioning	Бу:		Date:
Agency		1		Data
CHECKS	Checks by: Date:; Checks by: Date: Date:			



LAWA Commissioning Forms Humidifier, Steam

Instruct	ions: Step 1: Circle Yes or No and fill in wit Step 2: Explain all "No" responses at t				
Item	Step 2: Explain all "No" responses at t Task Description	the bottom of the checki		ponse	Comment:
D	Controls – Startup				
1	Sequence of control verified		Yes	No	
2	Unit operation accurately represented on m	nain system	Yes	No	
3	Airflow sensor operation verified		Yes	No	
4	Duct high limit humidistat operation verific	ed	Yes	No	
				<u> </u>	
	 				
	 				
	 				
				-	
				-	
	 			-	
				-	
				I	
	Responses:				
Item	Item			Reason for	"NO" Response
Contac	tor:	LAWA	Represent	ative:	
Checks	by:	Date: Checks	hw.		Date:
	issioning	, chesh.	oy		Butc
Agency					
Checks	by: Frint name Signature	Date:; Checks	by:		Date:
	Print name Signature	 :	Print na	me S	ignature



LAWA Commissioning Forms HVAC Piping: Installation

Instructions: Step 1: Circle Yes or No and fill in with requested information

Step 2: Explain all "No" responses at the bottom of the checklist

Step 3: Samples of installed ductwork will be periodically reviewed to verify compliance

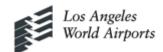
Item	Task Description	Response		Comment:
1	System Checks			
A	Installation Checks	Submitted	Delivered	
1	Piping is clean and free of damage prior to installation	Yes	No	
2	Piping is free to expand and contract without noise or damage to	Yes	No	
	hangers, joints, or the building.			
3	Piping is installed with sufficient pitch and arranged in a manner	Yes	No	
	to ensure drainage and venting of the entire system			
4	Manual air vents are provided at high points in close water	Yes	No	
	systems			
_	Changes in pipe sizes are made with the proper size reducing	Yes	No	
5	fittings, reducing fittings, reducing elbow or reducing tees.			
	Bushings are not allows	37	NT.	
6	All piping supports and hangers meet criteria set in Section 15140	Yes	No	
7	of the specification All fittings meet specification requirements.	Yes	No	
	All equipment requiring maintenance is accessible (valves,	Yes	No	
8	junction boxed, etc)	168	NO	
	Piping does not block access to equipment that is part of this	Yes	No	
9	system or another system (e.g., air terminal units)	103	140	
	Piping is installed in a manner to ensure that insulation will not	Yes	No	
10	contact adjacent surfaces	100		
1.1	All pipe openings are temporarily sealed to maintain piping system	Yes	No	
11	cleanliness			
12	Record drawings have been updated to reflect any changes made.	Yes	No	
13	Nipples are made of the same material as the pipe	Yes	No	
14	Connections between copper and steel pipes are made with	Yes	No	
14	dielectric fittings			
	A union is provided ahead of each screwed valve, trap, or strainer,	Yes	No	
15	and on each side of each piece of equipment and whatever needed			
	to dismantle piping.			
16	Mechanical coupling if used is only used for piping and location as	Yes	No	
10	described in the specification section 15060			
17	The chilled water system is installed with high pressure fittings,	Yes	No	
	flanges and unions			
18	Auxiliary drain valves are provided at all low points in hose bib	Yes	No	
ļ	piping to facilitate seasonal draining.			

Contactor:			LAWA Representative:		
Checks by:Commissioning		Date:	_; Checks by:		Date:
Agency: Checks by: Print name	Signature	Date:	_; Checks by: Print name	Signature	Date:



LAWA Commissioning Forms HVAC Piping: Installation

Instruct	Step 1: Circle Yes or No and fill i Step 2: Explain all "No" response Step 3: Samples of installed ducty	es at the bottom of the check	list	compliance	
			-	-	
			-		
Item	Date		Reason for "I	NO" Response	
				•	
	_				
Contac	tor:	LAW	A Representati	ve:	
Checks Comm	by:issioning	Date:; Checks	by:	¹	Date:
Agency	7:				
Checks	by:	Date:; Checks	by:		Date:
1	Print name Signature		Print name	e Signa	ature



LAWA Commissioning Forms HVAC Piping: Insulation

Instructions: Step 1: Circle Y	Yes or No and fill in	with requested information
--------------------------------	-----------------------	----------------------------

Step 2: Explain all "No" responses at the bottom of the checklist
Step 3: Samples of installed ductwork will be periodically reviewed to verify compliance
General Overall (Total Job) HVAC Piping Insulation Requirement

Item	Task Description	Response		Comment:
1	System Checks			
A	Installation Checks	Submitted	Delivered	
1	Piping is clean, dry and free of damage prior to installation.	Yes	No	
2	Pressure and leakage tests performed and reports have been	Yes	No	
	submitted prior to insulation installation.			
3	All chilled water piping is insulated with 1 ½ inch thick	Yes	No	
	fiberglass pipe insulation with vapor barrier except runouts to			
	radiant cooling panels located beyond 1' – 0" within room being			
	served.			
4	Secondary chilled water, low temperature chilled water (2 ½	Yes	No	
	inched thick), fan coil drain piping (2½ inched thick), and			
	piping with electric trace freeze protection is insulated in the			
	same manner as the chilled water pipes All chilled water pumps are insulated with 1 ½ inch thick	Yes	No	
5	rectangular box made of Manville 817 rigid fiberglass board	res	NO	
	having a density of 6 lb/ft ³ with rated vinyl coated and embossed			
	laminate vapor seal (ASJ) jacket.			
6	The insulation box for the pump is open at top and bottom with	Yes	No	
	a removable top to effect a complete insulation for each base	103	110	
	mounted pump.			
	The pipe insulation sections are firmly butted together and the	Yes	No	
7	longitudinal seam of the vapor barrier is cemented with Foster			
	No. 85-75.			
8	End joints are sealed with a minimum of 3 inch wide factory	Yes	No	
	furnished vapor barrier strips cemented with Foster No. 85-75			
9	All fittings, valves, strainers etc. is insulated as described in the	Yes	No	
	specifications.			
10	Exterior piping has a 0.016 inch aluminum jacket with moisture	Yes	No	
	barrier lock seam and Gasco of equal factory applied fittings in			
	lieu of glass cloth jackets, A sample is submitted		 	
		-	 	
			 	
			 	
			 	

Contactor:		LAWA Representative:			
Checks by: Commissioning		Date:	_; Checks by:		Date:
Agency: Checks by:		Date:	_; Checks by:		Date:
Print name	Signature		Print name	Signature	



LAWA Commissioning Forms HVAC Piping: Insulation (Continued)

Instruct	Instructions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the checklist							
"NO"	"NO" Responses:							
				ı				
Item	Date				Reason for "NO"	Response		
Contac	tor:			LAWA	A Representative:			
Checks	by:		Date:	; Checks	by:		Date:	
Agency	_		_	a	_			
Checks	by: Print name	Signature	Date:	; Checks	by: Print name	Signature	Date:	



LAWA Commissioning Forms

HVAC Piping: Insulation- Daily Checklist

Checklist for Daily Progress

- Instructions: Step 1: This form is completed daily by each work crew at the end of their shift, indicate crew/shift designation.
 - Step 2: Date and describe work completed in the appropriate section (1 for pre-installation and 2 for installation.
 - Step 3: verify achievement of quality requirements by circling "Yes" or "No". For negative responses, complete Section 3

1. Pre-insulation inspection by installer

Date	Description of Work Performed		Checklist Iten	ns	Percent	Initial
Date	(relate to drawings and number)	A. Clean	B. Valves	C. Material	Complete	
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		

- A. Piping clean or cleaned before insulation installed.
- B. Valves and other accessory surfaces were clean.
- C. Insulation material inspected to assure it had not been damaged.

2. Installation of Insulation Checklist by installer

	Description of Work Performed	Checklist Items			Percent	Initial
Date	(relate to drawings and drawing number)	A. Thick-	B. Sealed	C. Vapor	Complete	
		ness		barrier		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		
		Yes/No	Yes/No	Yes/No		

- A. Insulation thickness checked against project manual and is correct.
- B. The pipe insulation sections are firmly butted together and the longitudinal seam of the vapor barrier is cemented with foster No. 87-75.
- C. All vapor barriers installed.

3. Conflicts (Attach sketches or other documentation, including resolutions support; all items in section 1 and 2 to be noted in this section. In addition, any conflicts or non-compliance of any items on the general checklist (Checklist Number 8A) or items not on the checklist should be noted in this section. If Cx Team determines it is significant issues, items will be added to the daily checklist

Date	Description of Conflict	Resolution or Suggested Resolution	Resolved
			Yes/No

Contactor:			LAWA Representative:		
Checks by:Commissioning		_ Date:	; Checks by:		Date:
Agency: Checks by: Print name	Signature	_ Date:	; Checks by: Print name	Signature	Date:



LAWA Commissioning Forms Pump, HVAC

Instructions: Step 1: Circle Yes or No and fill in with requested information	
Step 2: Explain all "No" responses at the bottom of the checklist	

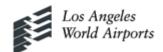
Item	Task Description	Rest	onse	Comment:
1	Delivery Book	Resp		Comment
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial Number			
4	Pump Type			
5	Impeller diameter (in.)			
6	Inlet / Outlet Sizes (in.)			
7	Capacity / Heat (gpm / ft wg)			
8	Motor Speed / Power (rmp/hp)			
9	Motor Voltage / Phase / Frequency (V/ _ / Hz)			
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	All components present	Yes	No	
3	The water openings are sealed with plastic plugs	Yes	No	
4	Unit tags affixed	Yes	No	
5	Installation and startup manual provided	Yes	No	
6	Manufacturer's ratings readable / accurate	Yes	No	
2	Construction Checklist			
A	Installation of Pump			
1	Unit is supported as required by manufacturer and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Unit labeled and is easy to see	Yes	No	
В	Piping			
1	All piping components have been installed (in the correct order) as required by detail drawing	Yes	No	
2	Piping arranged for ease of unit removal	Yes	No	
3	Shut-off valves and unions installed on inlet and outlet of pump	Yes	No	
4	Pressure gauges installed on inlet and outlet of pump	Yes	No	
5	Piping supported as required by specifications	Yes	No	
6	Piping is clean	Yes	No	
7	Piping insulation complete and installed as per specifications	Yes	No	
8	All valves and test ports are easily accessible	Yes	No	
9	Valve tags attached	Yes	No	

Contactor:			LAWA Representative:	
Checks by: Commissioning		_ Date:	; Checks by:	Date:
Agency: Checks by: Print name	Signature	_ Date:	; Checks by: Print name	Date: Signature



LAWA Commissioning Forms Pump, HVAC

Instructions: Step 1: Circle Yes or No and fill in with requested information							
	Step 2: Explain all "No" responses at the bottom of the checkli	st					
С	Electrical						
1	Safety disconnect installed in an accessible location	Yes	No				
2	Motor rotation in the proper direction	Yes	No				
3	All electrical connections are tight	Yes	No				
4	All electrical components are grounded	Yes	No				
D	Mechanical – Startup						
1	Unit checked, aligned, and certified prior to startup and report submitted	Yes	No				
2	Unit and motor lubricated before startup	Yes	No				
3	Pump shaft rotates easily with power turned off	Yes	No				
4	System starts and runs without any unusual noise or vibration	Yes	No				
5	Manufacturer's startup checklist completed and attached	Yes	No				
Е	TAB						
1	Flow Rate, gpm	Yes	No				
2	Inlet pressure (ft) / Outlet pressure (ft)	Yes	No				
3	Motor rotation in the proper direction	Yes	No				
4	Motor overload verified	Yes	No				
5	Motor voltage and amps verified – each phase	Yes	No				
6	Start-up strainer removed (after 24 hours)	Yes	No				
"NO"	Responses:		<u>"</u>				
110	xesponses.						
	.	1 -	9 (/3	1011 5			
Item	Item	1	Reason for "N	O" Responses			
		-					
		_					
Contac	etor: LAWA	Representativ	/e:				
		_					
Checks	by:; Checks b	oy:		Date:			
	issioning	-					
Agency	gency: hocks by: Data: Chocks by: Data:						
Checks		y: Print name		Date:			



LAWA Commissioning Forms Split System A/C Unit (Coil portion)

Instructions: Step 1: Circle Yes or No and fill in with requested information	
Step 2: Explain all "No" responses at the bottom of the checklist	

Item	Task Description	Rest	oonse	Comment:
1	Delivery Book	Tres,		Committee
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial Number			
4	Airflow (cfm)			
5	Fan Motor Power (hp)			
6	Fan Motor Voltage / Phase / Frequency (V/ _ / Hz)			
7	Total Cooling Capacity (MBH)			
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	All components present	Yes	No	
3	The refrigerant line openings are sealed	Yes	No	
4	Unit tags affixed	Yes	No	
5	Installation and startup manual provided	Yes	No	
2	Construction Checklist			
A	Installation of Split System Coil			
1	Unit supported using adequately sized mounting anchors	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Condensate drain piping un-trapped and runs to open sight drain	Yes	No	
6	Unit labeled and is easy to see	Yes	No	
В	Piping			
1	All piping components have been installed (in the correct order) as required by detail drawing	Yes	No	
2	Piping arranged for ease of unit removal	Yes	No	
3	Piping supported as required by specifications	Yes	No	
4	Refrigerant lines connected to indoor and outdoor units	Yes	No	
5	Piping is clean and free from leaks	Yes	No	
6	Piping insulation complete and installed as per specifications	Yes	No	
7	Unit filled with correct refrigerant	Yes	No	
8	All valves and test ports are easily accessible	Yes	No	
9	Valve tags attached	Yes	No	
		_		
		_		

Contactor:			LAWA Representative:		
Checks by:		Date:;	Checks by:		Date:
Agency: Checks by: Print name	Signature	Date:;	Checks by: Print name	Signature	Date:



LAWA Commissioning Forms Split System A/C Unit (Coil portion)

Instruct	ions: Step 1: Circle Yes or No and fill in with requested information			
	Step 2: Explain all "No" responses at the bottom of the check	list		
C	Electrical			
1	Local disconnect installed in an accessible location	Yes	No	
2	Fan motor rotation in the proper direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	
D	Control – installation			
1	Room thermostat installed and calibration verified	Yes	No	
2	Control wiring provided to outdoor (compressor) unit	Yes	No	
3	Communication with outdoor unit verified	Yes	No	
E	Control – startup			
1	Cooling sequence of control verified	Yes	No	
2	System starts and runs with no unusual noise or vibration	Yes	No	
3	Manufacturer's startup checklist completed and attached	Yes	No	
F	TAB			
1	Filters installed and are clean	Yes	No	
2	Entering and leaving air temperature (°F)	Yes	No	
3	Airflow (cfm)	Yes	No	
	7 milow (cilii)	103	110	
"NO" l	Responses:			
Item	Item]	Reason for "N	O" Responses
				-
G 4		1 D		
Contac	tor: LAW.	A Representati	ve:	
C1 1	Date Charles	1		Date
Checks		oy:		Date:
	issioning			
Agency		h		Data
Checks				Date:
ll .	Print name Signature	Print name	Sign	ature



LAWA Commissioning Forms

Split System A/C Unit (Compressor portion)

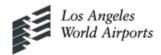
Instruct	ions: Step 1: Circle Yes or No and fill in with requested information			
	Step 2: Explain all "No" responses at the bottom of the checklis	t		
T4	To al. Donate d'un	D		C
Item 1	Task Description Delivery Book	Resi	onse	Comment:
A	Model Verification	Submitted	Delivered	
1 1	Manufacturer	Submitted	Denvered	
2	Model			
3	Serial Number			
4	Airflow (cfm)			
5	Fan Motor Power (hp)			
6	Fan Motor Voltage / Phase / Frequency (V/ _ / Hz)			
7	Ambient Temperature (°F)			
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	All components present	Yes	No	
3	The refrigerant line openings are sealed	Yes	No	
4	Unit tags affixed	Yes	No	
5	Installation and startup manual provided	Yes	No	
2	Construction Checklist			
A	Installation of Split System Compressor			
1	Unit secured as required by manufacturer and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit labeled and is easy to see	Yes	No	
В	Piping			
1	All piping components have been installed (in the correct order) as required by detail drawing	Yes	No	
2	Piping arranged for ease of unit removal	Yes	No	
3	Piping supported as required by specifications	Yes	No	
4	Refrigerant lines connected to indoor and outdoor units	Yes	No	
5	Piping is clean and free from leaks	Yes	No	
6	Piping insulation complete and installed as per specifications	Yes	No	
7	Unit filled with correct refrigerant	Yes	No	
8	All valves and test ports are easily accessible	Yes	No	
9	Valve tags attached	Yes	No	
Contac	tor: LAWA	Representati	ve:	
		•		
	by: Date:; Checks by	y:		Date:
Commi	issioning			
Agency				
Checks	by: Date:; Checks by	y:		Date:

Print name

Signature

Print name

Signature



LAWA Commissioning Forms

Split System A/C Unit (Compressor portion)

Instruct	ions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the checklis	st		
C	Electrical			
1	Local disconnect installed in an accessible location	Yes	No	
2	Fan motor rotation in the proper direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	
D	Control – installation			
1	Control wiring provided to outdoor (compressor) unit	Yes	No	
2	Communication with outdoor unit verified	Yes	No	
E	Control – startup			
1	Safety items operational (high pres., low pres., discharge temp. switch).	Yes	No	
2	System starts and runs with no unusual noise or vibration	Yes	No	
3	Manufacturer's startup checklist completed and attached	Yes	No	
	•			
"NO"]	Responses:			
Item	Item	1	Reason for "	NO" Responses
		1		F
		1		
		1		
Contac	ttor: LAWA	Representativ	ve:	
Checks	by:; Checks b	v·		Date:
	issioning	J ·		Daw
Agency				
		***		Data
LOHECKS	by: Date: : Checks b	٧.		Date:
CHECKS	by: Date:; Checks by Print name Signature	Print name		nature

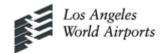


LAWA Commissioning Forms Unit Heater

Instructions: Step 1: Circle Yes or No and fill in with requested information	
Step 2: Explain all "No" responses at the bottom of the checklist	

T4	m i n	Task Description Response		<u> </u>
Item	Task Description	Resi	onse	Comment:
1	Delivery Book	G 1 1 1	D 11 1	
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial Number			
4	Total Heating Capacity (MBH)			
5	Fan Motor Power (hp)			
6	Fan Motor Voltage / Phase / Frequency (V/ _ / Hz)			
7	Heating Fluid Flow /Pressure Drop (gpm / ft wg)			
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	All components present	Yes	No	
3	The water openings are sealed with plastic plugs	Yes	No	
4	Manufacturer's data readable/ accurate	Yes	No	
5	Unit identification attached and visible	Yes	No	
2	Construction Checklist			
A	Installation of Unit Heater			
1	Unit supported using adequately sized mounting anchors	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Unit identification attached and visible	Yes	No	
В	Piping			
1	All piping components have been installed (in the correct order) as	Yes	No	
1	required by detail drawing			
2	Piping arranged for ease of unit removal	Yes	No	
3	Piping supported as required by specifications	Yes	No	
4	Piping is clean	Yes	No	
5	Piping insulation complete and installed as per specifications	Yes	No	
6	All valves and test ports are easily accessible	Yes	No	
С	Electrical			
1	Local disconnect installed in an accessible location	Yes	No	
2	Motor rotation in the proper direction	Yes	No	
3	All electrical connections are tight	Yes	No	
4	All electrical components are grounded	Yes	No	

Contactor:					
Checks by: Commissioning		Date:	; Checks by:		Date:
Agency: Checks by: Print name	Signature	Date:	; Checks by:Print name	Signature	Date:



LAWA Commissioning Forms Unit Heater

	~ ~	mation		
	Step 2: Explain all "No" responses at the bottom of the	checklist		
D				
<u>D</u>	Control Room thermostat installed and calibration verified	Vac	No	
1	Hot water actuator calibration verified	Yes Yes	No No	
2				
3	Heating sequence of control verified	Yes	No	
4	Valve tags are attached	Yes	No	
E	TAB	- V	NT.	
1	Motor rotation in the proper direction	Yes	No	
2	Motor overloads verified	Yes	No	
3	Motor voltage and amps verified – each phase	Yes	No	
4	Entering and leaving air temperatures (°F)	Yes	No	
5	Flow and air/water pressure drops verified	Yes	No	
(2102)	<u> </u>			
"NU" i	Responses:			
Item	Item	I	Reason for "N	O" Responses
Item	Item	I	Reason for "N	O" Responses
Item	Item	I	Reason for "N	O" Responses
Item	<u>Item</u>	I	Reason for "N	O" Responses
Item	Item]	Reason for "N	O" Responses
Item	Item]	Reason for "N	O" Responses
Item	Item		Reason for "N	O" Responses
Item	Item		Reason for "N	O" Responses
Item	Item		Reason for "N	O" Responses
Item		LAWA Representativ		O" Responses
Contac	tor:	LAWA Representativ	ve:	
Contac	tor: Date:; C		ve:	
Contac Checks Commi	tor: Date:; C	LAWA Representativ	ve:	
Contac Checks Commi	tor: Date:; C ssioning	LAWA Representative thecks by:	ve:	Date:
Contac Checks Commi	tor: Date:; C ssioning	LAWA Representative thecks by:	ve:	Date:

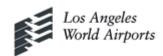


LAWA Commissioning Forms Variable Speed Drive

Instructions: Step 1: Circle Yes or No and fill in with requested information	,
Step 2: Explain all "No" responses at the bottom of the checklist	

Item	Task Description	Resi	oonse	Comment:
1	Delivery Book			
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial Number			
4	Service Area			
5	Maximum Capacity (amps)			
6	Voltage / Phase / Frequency (V/ _ / Hz)			
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	All components present	Yes	No	
3	Installation and startup manual provided	Yes	No	
4	Wiring schematics (electrical & controls) for this application	Yes	No	
	attached			
5	Unit tags affixed	Yes	No	
6	Manufacturer's ratings readable/accurate	Yes	No	
2	Construction Checklist			
A	Installation of VSD			
1	Unit secured as required by manufacturer and specifications	Yes	No	
2	Adequate clearance around unit for service	Yes	No	
3	All components accessible for maintenance	Yes	No	
4	Unit can be removed from building	Yes	No	
5	Unit labeled and is easy to see	Yes	No	
6	Wiring schematic inside enclosure and includes bypass section	Yes	No	
В	Electrical			
1	Drive to motor leads are in grounded metal conduit	Yes	No	
2	All electrical connections are tight	Yes	No	
3	All electrical components are grounded	Yes	No	
C	Control – Installation			
1	Control panel accessible and labeled properly	Yes	No	
2	Low voltage control signals are shielded and in own conduit	Yes	No	
3	Auxiliary safeties (F/A shutdown, etc) are installed and operational	Yes	No	
4	Analog output to control unit is isolated type	Yes	No	

Contactor: LAWA Representative:					
Checks by: Commissioning		_ Date:	; Checks by:	Date:	
Agency: Checks by: Print name	Signature	_ Date:	; Checks by:Print name	Date: Date:	



LAWA Commissioning Forms Variable Speed Drive

Instruct	ions: Step 1: Circle Yes or No and fill in with requested information			
	Step 2: Explain all "No" responses at the bottom of the checklist			
D	Electrical Dro startum Chaeles			
<u>ע</u>	Electrical – Pre-startup Checks Motor full load amps less than max rating, design / actual	Yes	No	
2	Input voltage, design / actual (within 10% of rating)	Yes	No	
3	All grounds verified	Yes	No	
4	All fuses verified	Yes	No	
E	Electrical – Startup	103	110	
1	VSD properly powers up	Yes	No	
2	Stop button works	Yes	No	
3	Motor rotation is in the proper direction	Yes	No	
4	Minimum and maximum speeds reached using remote command	Yes	No	
	"Accel" and "Decel" adjustments are made within the drive and do	Yes	No	
5	not depend on ramping signal from the DDC controls	105	140	
6	VSD restarts automatically	Yes	No	
7	No disconnect on load side of VSD	Yes	No	
8	Critical frequencies have been programmed out of VSD (if applicable)	Yes	No	
9	Motor runs in bypass mode while servicing or removing unit	Yes	No	
10	Motor overload protection and phase loss protection provided during bypass mode	Yes	No	
11	System starts and runs without any unusual noise or vibration	Yes	No	
12	Manufacturer's startup checklist completed and attached	Yes	No	
"NO" I	Responses:			
Item	Item]	Reason for "N	NO" Responses
				-
Contac	tor: LAWA I	Representati	ve:	
Checks	by:; Checks by			Date:
	by:; Checks by	•		Date
Agency	0			
Checks		:		Date:
CHOCKS	Print name Signature	Print name		nature
			~151	



LAWA Commissioning Forms VAV Box, Fan Power w/ Elect heat

Instructions: Step 1: Circle Yes or No and fill in with requested information	
Step 2: Explain all "No" responses at the bottom of the checklist	

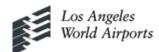
Item	Task Description	Response		Comment:	
1	Delivery Book				
A	Model Verification	Submitted	Delivered		
1	Manufacturer				
2	Model				
3	Serial Number				
4	Size (in)				
5	Max / Min Airflow (cfm)				
6	Heating Capacity (MBH/kW)				
7	Total Static Pressure (in. w.g.)				
8	Fan Power / Speed (hp/rpm)				
6	Voltage / Phase / Frequency (V/ _ / Hz)				
В	Physical Checks				
1	Unit is free from physical damage	Yes	No		
2	The air openings are sealed with plastic	Yes	No		
3	The airflow sensing tubing is plugged	Yes	No		
4	The grommets for the airflow sensing tubing are secure	Yes	No		
5	The enclosure for the DDC control panel is in the proper location	Yes	No		
6	Installation and startup manual provided	Yes	No		
7	Unit tags affixed	Yes	No		
8	Manufacturer's ratings readable/accurate	Yes	No		
2	Construction Checklist				
A	Hanging				
1	Unit is supported as required by manufacturer and specifications	Yes	No		
2	Metal to metal connections eliminated to prevent noise problems	Yes	No		
3	Adequate clearance around control panel for maintenance	Yes	No		
4	Clear access below unit for easy maintenance	Yes	No		
5	Unit labeled and is easy to see	Yes	No		
6	Box openings temporarily sealed to maintain system cleanliness	Yes	No		
В	Ductwork				
1	Balancing damper present on inlet duct	Yes	No		
2	Sufficient length of straight ductwork installed upstream of unit	Yes	No		
3	Downstream ductwork free of transitions for sufficient length	Yes	No		
4	All components are accessible for maintenance				
5	Flexible connector (vibration isolator) installed on inlet duct to				
5	avoid noise problems from metal to metal contact				
6	Flex duct (if used) is installed in a way that avoids forming kinks				
	on both inlet and outlet ductwork				

l l		
Contactor:	LAWA Representative:	
Checks by:	Date:; Checks by:	Date:
Agency: Checks by: Print name	Date:; Checks by: Signature Signa	Date:



LAWA Commissioning Forms VAV Box, Fan Power w/ Elect heat

Instructions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the checklist						
T						
С	Electrical Heating Coil					
1	Heating coil inspected for damage prior to applying power	Yes	No			
2	Wiring is properly sized	Yes	No			
3	All electrical connections are properly grounded	Yes	No			
4	All electrical connections are tight	Yes	No			
D	Electrical	_				
1	Local disconnect switch installed in an accessible location	Yes	No			
2	Motor rotation is in the proper direction	Yes	No			
3	All electrical connections are tight	Yes	No			
4	All electrical components are grounded	Yes	No			
5	Variable speed selector is operational	Yes	No			
6	P.E. switch is operational	Yes	No			
E	Controls – Installation					
1	Temperature sensor calibration verified	Yes	No			
2	Airflow sensor calibration verified	Yes	No			
3	Point-to-point connections of control wiring verified	Yes	No			
4	Central system accurately represents condition of unit	Yes	No			
F	Control – Startup					
1	Cooling/heating sequence of control verified	Yes	No			
2	Warm-up/cool-down sequence of control verified	Yes	No			
3	Unoccupied sequence of control verified	Yes	No			
G	TAB					
1	Motor rotation is in the proper direction	Yes	No			
2	Motor overloads verified	Yes	No			
3	Motor voltage and amps verified – each phase	Yes	No			
4	Minimum airflow (cfm) (design/measured)	Yes	No			
5	Maximum airflow (cfm) (design/measured)	Yes	No			
6	Entering and leaving coil air temperatures (°F)	Yes	No			
"NO" I	Responses:					
	•					
Item	Item]	Reason for "N	NO" Responses		
Contactor: LAWA Representative:						
Checks by: Date:; Checks by: Date:						
Checks		by:		Date:		
	ssioning					
Agency Checks		h		Data		
CHECKS	by: Date:; Checks Print name Signature	Print name		Date: nature		
	Fillit name Signature	Fillit manne	Sign	latule		



LAWA Commissioning Forms VAV Box, Non Fan Powered w/HW Heat

	Step 2: Explain all "No" responses at the bottom of the checklis			
Item	Task Description	Res	ponse	Comment:
1	Delivery Book			
A	Model Verification	Submitted	Delivered	
1	Manufacturer			
2	Model			
3	Serial Number			
4	Size (in.)			
5	Max/Min Airflow (cfm)			_
6	Heating Capacity (MBH/gpm)			_
В	Physical Checks			
1	Unit is free from physical damage	Yes	No	
2	The air openings are sealed with plastic	Yes	No	
3	The water openings are sealed with plastic plugs	Yes	No	
4	The airflow sensing tubing is plugged	Yes	No	
5	The grommets for the airflow sensing tubing are secure	Yes	No	
6	The enclosure for the DDC control panel is in the proper location	Yes	No	
7	Installation and startup manual provided	Yes	No	_
8	Unit tags affixed	Yes	No	
9	Manufacturer's ratings readable/accurate	Yes	No	
2	Construction Checklist			
A	Hanging			
1	Unit is supported as required by manufacturer and specifications	Yes	No	
2	Metal to metal connections eliminated to prevent noise problems	Yes	No	
3	Adequate clearance around control panel for maintenance	Yes	No	
4	Clear access below unit for easy maintenance	Yes	No	
5	Unit labeled and is easy to see	Yes	No	
6	Box openings temporarily sealed to maintain system cleanliness	Yes	No	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		<u> </u>	<u> </u>	
		1		
Contac	tor: LAWA	Representati	ive:	

Signature

Print name

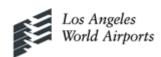
Commissioning **Agency:** Checks by:

_; Checks by:

Print name

Date:

Signature



LAWA Commissioning Forms VAV Box, Non Fan Powered w/HW Heat

Instructions: Step 1: Circle Yes or No and fill in with requested information Step 2: Explain all "No" responses at the bottom of the checklist						
В	Ductwork					
<u>в</u>	Balancing damper present on inlet duct	Yes	No			
2	Sufficient length of straight ductwork installed upstream of unit	Yes	No			
3	Downstream ductwork free of transitions for sufficient length	Yes	No			
4	All components are accessible for maintenance	Yes	No No			
5	Flexible connector (vibration isolator) installed on inlet duct to avoid noise problems from metal-to-metal contact	Yes	No			
6	Flex duct (if used) is installed in a way that avoids forming kinks	Yes	No			
	on both inlet and outlet ductwork					
C	Piping					
1	All piping components have been installed (in the correct order) as required by detail drawing	Yes	No			
2	Piping is arranged for ease of unit/coil removal	Yes	No			
3	Piping supported as required by specifications	Yes	No			
4	Piping is clean	Yes	No			
5	Piping insulation is complete and installed as per specifications	Yes	No			
6	All valves and test ports are easily accessible	Yes	No			
7	Valve tags attached	Yes	No			
D	Controls - Installation					
1	Temperature sensor calibration verified	Yes	No			
2	Airflow sensor calibration verified	Yes	No			
3	Point-to- Point connections of control wiring verified	Yes	No			
4	Central system accurately represents condition of unit	Yes	No			
E	Controls – Startup	155	110			
1	Cooling/heating sequence of control verified	Yes	No			
2	Warm-up/cool-down sequence of control verified	Yes	No			
3	Unoccupied sequence of control verified	Yes	No			
	Offoccupied sequence of control vertified	103	110			
		<u> </u>	<u> </u>			
			<u> </u>			
			├ ───			
			├ ───			
		ı 	├			
			<u> </u>			
			<u> </u>			
[<u> </u>	<u> </u>			
		<u> </u>	<u> </u>			
		<u> </u>	<u> </u>			
Contac	tor: LAWA I	Representativ	ve:			
Checks by: Date:; Checks by: Date:						
Commissioning						
Agency:						
Checks		J*		Date:		
C	Print name Signature, Checks by	Print name				



LAWA Commissioning Forms VAV Box, Non Fan Powered w/HW Heat

Instructions: Step 1: Circle Yes or No and fill in with requested information						
Step 2: Explain all "No" responses at the bottom of the checklist						
				11		
F	TAB	•		***	.,	
1	Minimum airflow (cfm) (design / me			Yes	No	
2	Maximum airflow (cfm) (design / me			Yes	No	
3	Entering and leaving coil air tempera			Yes	No	
4	Entering and leaving coil water temp			Yes	No	
5	Coil flow and air/water pressure drop	s verified		Yes	No	
				-		
				-		
				-		
				-		
				-		
				_		
				-		
				-		
				-		
				_		
Item	Date			Reason for "N	O" Response	
					•	
Contac	tor:		LAWA	Representativ	re:	
Checks by:		Date:	te:; Checks by: Date:		Date:	
	Commissioning Bate, Checks by Bate					
Agency						
		Date:	: Checks	by:		Date:
	Print name Signature			Print name	Signa	