



TECH3000



FX4CSX indoor unit



38EYX outdoor unit



Quality Management System Approval

38EYX/FX4CSX

Nominal cooling capacity 6.8-16.7 kW

Nominal heating capacity 6.6-17.1 kW

The 38EYX/FX4CSX direct-expansion split-system heat pumps are designed to give quiet, reliable heating during the winter or cooling during the summer. As reversible air-to-air heat pump systems they recover heat for indoor comfort from outdoor air during the heating season and reverse automatically to remove indoor heat and excess humidity during the cooling season, providing excellent comfort all year round. They are designed for light commercial and residential applications and ideal for installations in extreme temperature conditions. The system runs on the ozone-friendly refrigerant R410A and consists of the 38EYX outdoor unit sections and the FX4CSX encased indoor fan coils, complete with direct-expansion indoor coil.

System features

- Four model combinations available, offering for high-efficiency operation, application flexibility, ease of installation and high-tech components.
- The new design provides excellent energy efficiency (class A and B), both in cooling and heating mode.
- The TECH3000 system has been optimised to run on the ecological R410A refrigerant.
- Systems are offered in 230-1-50 (size 024) and 400-3-50 (sizes 036-060) power supplies. Three-phase systems include a control board to monitor the electrical phases and prevent compressor damage in the case of incorrect wiring.
- Design and construction are in compliance with European standards.

Outdoor unit features

- The compressor is specifically designed for heat pump duty and high-energy efficiency, and hermetically sealed to assure long life and dependable performance. A sound hood and rubber isolators ensure quiet operation. A thicker shell and an anti-reverse rotation device enhance reliability, and a terminal plug accumulator improves serviceability.
- The unit is rated for continuous operation between 13°C and 52°C without low-ambient kit in the cooling mode, and between -34°C and 19°C in the heating mode.
- A discharge-line muffler minimises low-frequency sound and prevents transmission of refrigerant gas pulsations to the indoor or outdoor coils or to the interconnecting pipework.
- Comprehensive protection:
 - High and low-pressure switches reduce the likelihood of compressor damage in case the refrigerant circuit is operated outside the allowable range.
 - A suction accumulator optimises the amount of refrigerant in the circuit.
 - Crankcase heaters (standard on sizes 036, 048 and 060) keep the compressor oil warm and free of refrigerant to maximise compressor lubrication and system reliability.
 - The Time Guard time delay relay is provided as standard to prevent compressor short cycling, and a liquid line filter drier is also provided (requires field installation).
- Quiet efficiency - fans discharge vertically carrying any sound up and away from neighbours wherever the unit is

installed. The units are ideal for installation on a roof with limited space.

- The heavy-duty galvanised steel casing is protected with a zinc phosphate layer and finished with a polyester powder paint coating; all external screws are coated for long-lasting corrosion resistance.
- The fan motors are totally enclosed for excellent reliability under demanding weather conditions.
- Easy access to all internal components and external front-seating brass service valves for sweat connection facilitate installation and service.
- Three-phase control board monitors the electrical phases and prevents compressor operation, if incorrectly wired.

Indoor unit features

- The ducted indoor units are designed for vertical (upflow or downflow) and horizontal installations. Downflow installations require an accessory conversion package.
- Indoor coils use internally grooved copper tubes with lanced sine wave aluminium fins.
- Fans are direct-drive centrifugal type, powered by permanent split capacitor motors with field-selectable three-speed operation.
- Solid-state fan control with auxiliary fan relay.
- Factory installed cooling controls.
- 40-VA/24-V control power transformer; a replaceable 5 A automotive type fuse protects the transformer against secondary short circuiting.
- Permanent easy-access return air filter is standard; this filter collects large dust particles from the return air entering the fan coil and prevents them from collecting on the coil.

- Unit enclosures with high-density insulation are fabricated of pre-painted galvanised steel for maximum durability and resistance to corrosion.
- Refrigerant flow control is accomplished via bypass AccuRater.
- Reinforced plastic condensate pan with brass drain connection inserts. Secondary drain connection.

Outdoor unit accessories

- Indoor coil freeze thermostat
- Isolation relay
- Compressor start assistance capacitor/relay (size 024)
- Thermostatic expansion valve (TXV)
- Liquid line solenoid valve
- Low-ambient Motormaster control
- Crankcase heater (size 024)
- Cycle protector
- Programmable and non-programmable TSTAT thermostats
- Outdoor air temperature sensor

Indoor unit accessories

- Downflow conversion kit
- Downflow/horizontal gasket kit
- Disconnect kit
- PVC condensate trap kit
- Filter kit
- Programmable and non-programmable room thermostats

Performance data

		024	036	048	060
		024	036	048	060
Nominal cooling capacity	kW	6.83	9.98	13.66	16.73
Nominal power input, cooling	kW	2.12	3.14	4.37	5.87
EER, cooling	W/W	3.22	3.18	3.13	2.85
Annual power consumption, cooling	kW/h	1060	1570	NA	NA
Energy efficiency class, cooling		A	B	NA	NA
Nominal heating capacity	kW	6.64	10.39	14.48	17.07
Nominal power input, heating	kW	1.83	2.98	3.82	5.03
COP, heating	W/W	3.63	3.49	3.79	3.39
Energy efficiency class, heating		A	B	NA	NA

Rated performances, measured with 7.5 m pipe length, based on:

Cooling - indoor air temperature 27°C dry bulb/19°C wet bulb, outdoor air temperature 35°C dry bulb/24°C wet bulb.

Heating - indoor air temperature 20°C dry bulb/15°C wet bulb, outdoor air temperature 7°C dry bulb/6°C wet bulb.

Physical data

		024	036	048	060
Operating weight	kg	65.8	83.9	99.3	111.6
Refrigerant Charge	kg	R-410A 2.61	3.69	4.82	6.35
Compressor		One scroll compressor			
Outdoor fan		Propeller type, direct drive			
Air discharge		Vertical			
Air flow	l/s	755	1274	1416	1180
Motor speed	r/s	15	15	15	15
Sound power level, cooling/heating	dB(A)	72/72	72/72	72/72	74/74
Sound pressure level, cooling/heating*	dB(A)	52/52	52/52	52/52	54/54
Sweat connections, gas - liquid	in	5/8 - 3/8	3/4 - 3/8	7/8 - 3/8	7/8 - 3/8
Maximum elevation	m	45**	45**	45**	45**
Maximum pipe length	m	50	50	50	50
Pre-charged pipe length	m	4.5	4.5	4.5	4.5
Additional refrigerant charge	g/m	56	56	56	56
		024	036	048	060
Operating weight	kg	55	67	72	80
Unit arrangement		Upflow, downflow, horizontal (LH)			
Dehumidification (at rated conditions)	l/h	3.4	4.6	7.0	8.2
Fan type		Centrifugal, direct drive			
Nominal air flow	l/s	475	600	750	825
Max. static pressure	Pa	125	125	125	125
Sound power level	dB(A)	72	77	77	80
Sound pressure level***	dB(A)	56	61	61	64
Sweat connections, gas - liquid	in	5/8 - 3/8	3/4 - 3/8	7/8 - 3/8	7/8 - 3/8

* Sound pressure level is measured in a hemispheric field at 4 m distance from the unit.

** If the outdoor unit is positioned below the indoor unit the maximum elevation is 15 m.

*** Sound pressure level is measured in an anechoic room at 1.28 m distance from a discharge outlet on the wall.

Electrical data

38EYX		024	036	048	060
Power supply	V-ph-Hz	230-1-50	400-3-50	400-3-50	400-3-50
Voltage range	V	187-253	360-440	360-440	360-440
Compressor LRA	A	61	48	64	74
Compressor RLA	A	12.5	6.4	9.0	10.6
Fan full load current	A	0.6	0.7	0.7	0.7
Max. operating current	A	16.2	8.7	12.0	14.0
Fuse rating*	A	25	15	20	20

FX4CSX		024	036	048	060
Full load current	A	1.5	1.8	2.7	3.6
Minimum circuit current	A	1.9	2.3	3.4	4.5
Fuse rating	A	15	15	15	15
Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50

* Time-delay fuse

Note: The control circuit is 24 V on all units and requires an external power source. Copper wire must be used from the disconnect to the unit.

All motors/compressors contain internal overload protection.

LRA - Locked rotor current, A

RLA - Rated load current, A

Outdoor unit metering device

38EYX size	Outdoor piston	Indoor piston
024-70	40	52
036-90	49	65
048-90	65	76
060-90	73	88

Operating limits

	Cooling mode	Heating mode
Maximum outdoor temperature	52°C	19°C db/18°C wb
Maximum indoor temperature	32°C db/23°C wb	27°C db
Minimum outdoor temperature	13°C*	-34°C db
Minimum indoor temperature	21°C db/15°C wb	-

* With low-ambient kits the minimum outdoor temperature in cooling mode is -29°C.

Outdoor unit sound power levels, dB(A)

38EYX size	Sound level	Typical octave band spectrum (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
024	72	76.0	69.0	66.0	65.5	61.5	58.0	56.0
036	72	71.5	68.0	68.5	67.5	65.5	61.5	53.5
048	72	67.5	66.0	69.5	67.5	63.0	60.5	57.0
060	74	70.0	68.5	68.5	69.0	65.5	61.5	55.5

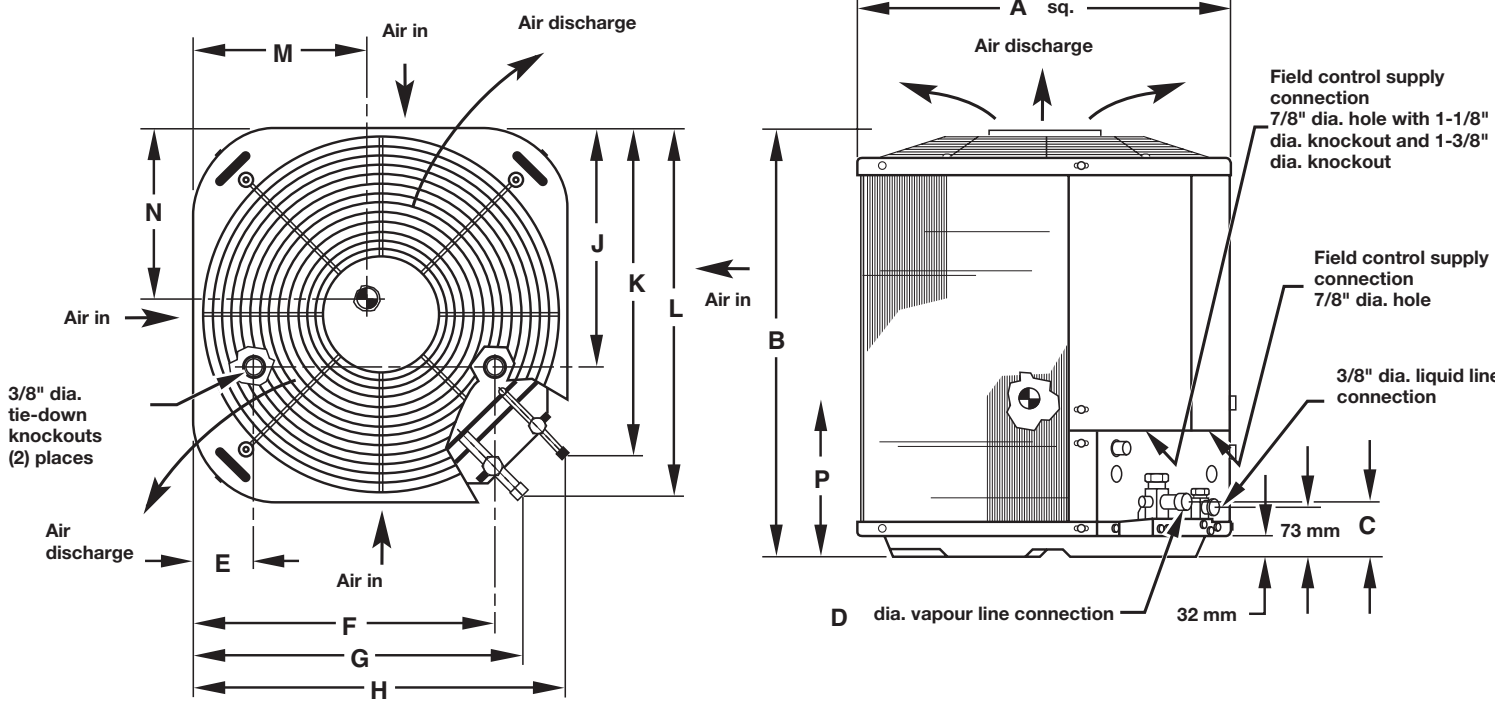
Sound power levels in accordance with ARI standard 270-95.

Indoor unit sound power levels, dB(A)

FX4CSX size	Sound rating	Typical octave band spectrum (with tone adjustment)							
		63	125	250	500	1000	2000	4000	8000
024	72	68.5	69.0	66.0	68.5	67.0	65.0	64.5	58.5
036	77	69.5	71.5	70.5	71.5	71.0	69.5	70.0	63.5
048	77	70	72.5	71.5	71.5	71.5	70.0	70.5	64.5
060	80	75.5	76.5	75.5	73.5	73.5	72.5	73.5	69.5

Sound power levels in accordance with Eurovent standards 6/C/006-97 and 8/4.

Dimensions 38EYX

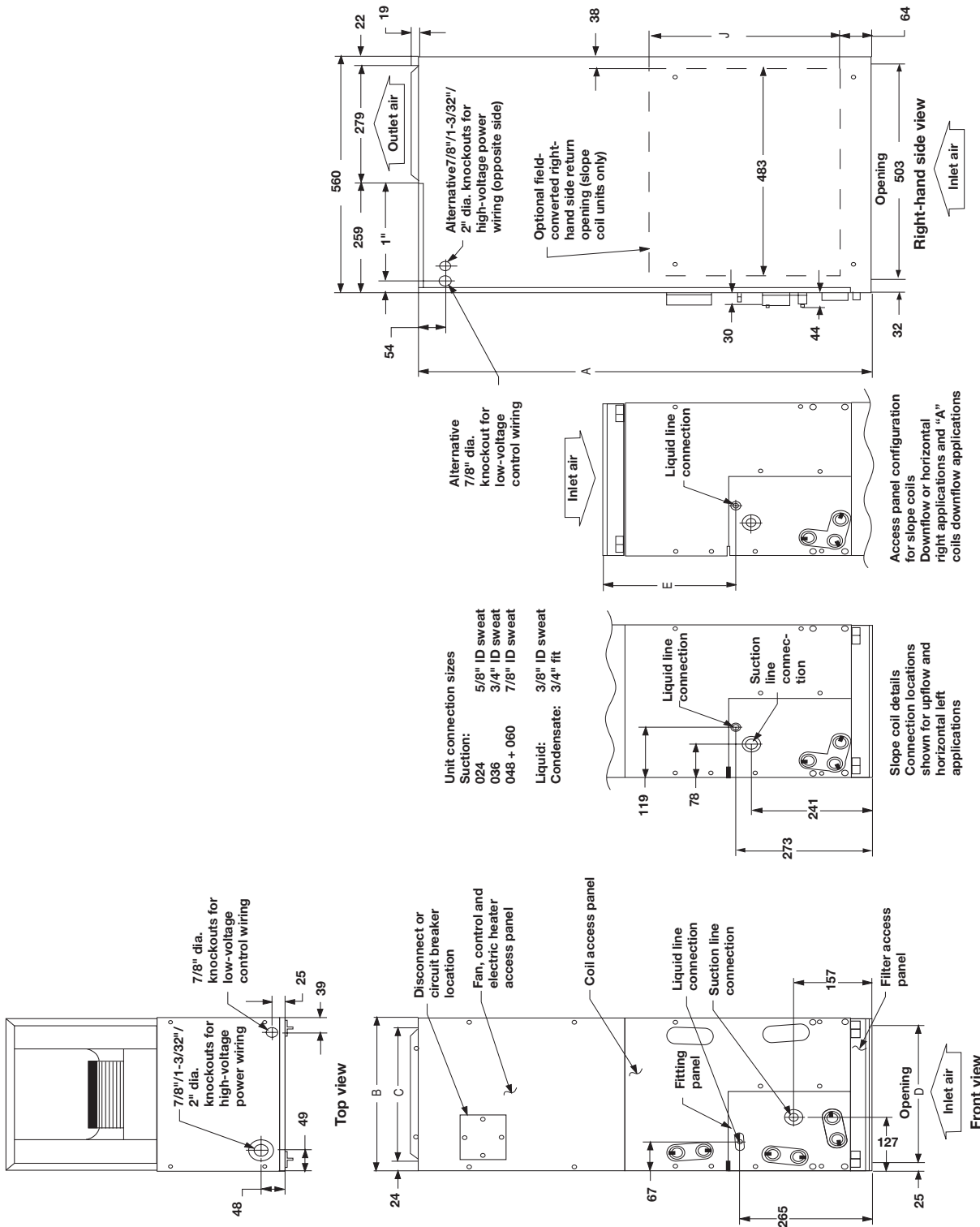


- Notes:
1. Allow 760 mm clearance to service side of unit, 1220 mm above unit, 150 mm on one side, 300 mm on remaining side, and 610 mm between units for proper air flow.
 2. Minimum outdoor operating ambient in cooling mode is 13°C (unless low ambient control is used), max. 52°C.
 3. Maximum outdoor operating ambient in heating mode is 19°C.
 4. Series designation is the 13th position of the unit model number.
 5. Centre of gravity

Unit dimensions

38EYX Series	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Minimum mounting pad dimensions, mm	
	mm	mm	mm	in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
024	70	571.5	760.4	81.0	5/8	93.7	460.4	501.7	549.3	365.1	479.4	560.4	279.4	127.0	355.6	571.5 x 571.5
036	90	762.0	760.4	81.0	3/4	165.1	596.9	692.2	739.8	508.0	669.9	750.9	406.4	317.5	317.5	762.0 x 762.0
048	90	762.0	1014.4	82.6	7/8	165.1	596.9	692.2	739.8	508.0	669.9	750.9	381.0	400.1	355.6	762.0 x 762.0
060	90	762.0	862.0	82.6	7/8	165.1	596.9	692.2	739.8	508.0	669.9	750.9	349.3	396.9	381.0	762.0 x 762.0

FX4CSX Dimensions



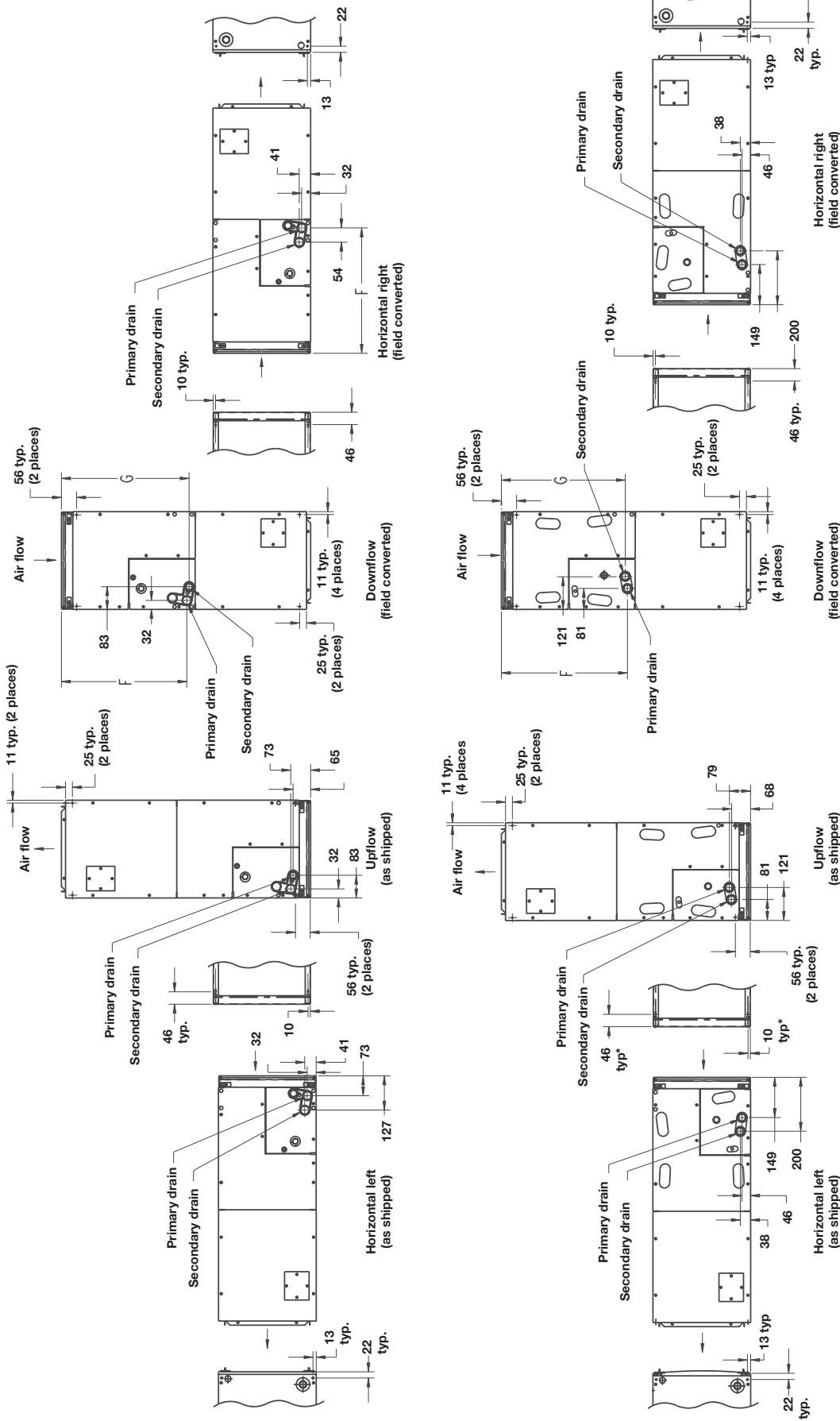
All dimensions are in mm.

- Notes:**
1. Series designation is the 14th position of the units product number.
 2. Allow 533 mm from front for service.

Shown with "A" coil detail connection locations for upflow or horizontal applications

FX4CSX Size	Series	Coil type	A mm	B mm	C mm	D mm	J mm
024	A	Slope	1212	448	400	397	432
036	A	Slope	1357	537	489	486	463
048	A	A	1261	537	489	486	-
060	A	A	1357	537	489	486	-

FX4CSX Dimensions (cont.)



Condensate drain pan not shown for clarity.

* Horizontal mount locations: Dimples provided in the top panel and back of cabinet. In cabinet bottom holes provided 3 mm dia. Horizontal hanging hardware to be field supplied.

FX4CSX size	Series	Coil type	F mm	G mm
024	A	Slope	587	600
036	A	Slope	684	699
048	A	A	593	587
060	A	A	692	684

Detailed system cooling capacities*

Coil air		Condenser entering air temperature, °C																					
Air flow	EWB	28			32			36			40			44			48			52			
		TC	SC	kW	TC	SC	kW	TC	SC	kW	TC	SC	kW	TC	SC	kW	TC	SC	kW	TC	SC	kW	
38EYX02470 Outdoor Section With FX4CSX024 Indoor Section																							
330	22	7.35	3.86	1.78	7.18	3.81	1.99	6.99	3.74	2.18	6.85	3.72	2.38	6.58	3.62	2.59	6.28	3.51	2.81	5.94	3.39	3.04	
	20	7.17	4.64	1.77	7.00	4.62	1.98	6.84	4.60	2.16	6.62	4.53	2.36	6.34	4.44	2.57	6.04	4.33	2.79	5.70	4.20	3.02	
	18	6.93	5.49	1.76	6.79	5.53	1.96	6.57	5.48	2.15	6.32	5.39	2.34	6.04	5.29	2.55	5.73	5.16	2.77	5.39	5.02	3.00	
	16	6.71	6.45	1.74	6.49	6.36	1.94	6.26	6.26	2.13	6.03	6.03	2.33	5.80	5.80	2.54	5.54	5.54	2.77	5.26	5.26	2.99	
380	22	7.39	3.93	1.80	7.20	3.88	2.01	7.01	3.82	2.21	6.87	3.81	2.41	6.61	3.73	2.64	6.31	3.62	2.84	5.96	3.49	3.07	
	20	7.20	4.77	1.80	7.01	4.73	2.00	6.89	4.77	2.19	6.66	4.70	2.39	6.39	4.62	2.59	6.08	4.52	2.82	5.74	4.40	3.05	
	18	6.99	5.70	1.78	6.85	5.78	1.98	6.64	5.75	2.17	6.39	5.68	2.37	6.11	5.58	2.58	5.80	5.46	2.80	5.46	5.30	3.03	
	16	6.79	6.79	1.77	6.61	6.61	1.97	6.42	6.42	2.16	6.21	6.21	2.36	5.97	5.97	2.57	5.70	5.70	2.79	5.42	5.42	3.02	
425	22	7.40	4.00	1.83	7.22	3.95	2.03	7.03	3.89	2.23	6.84	3.83	2.43	6.63	3.81	2.64	6.32	3.71	2.86	5.97	3.58	3.09	
	20	7.23	4.88	1.82	7.04	4.85	2.02	6.90	4.88	2.21	6.69	4.86	2.41	6.42	4.79	2.62	6.10	4.69	2.84	5.76	4.57	3.07	
	18	7.02	5.88	1.81	6.87	5.98	2.01	6.68	5.98	2.19	6.44	5.93	2.39	6.16	5.81	2.60	5.85	5.69	2.82	5.52	5.52	3.05	
	16	6.85	6.85	1.79	6.71	6.71	2.00	6.53	6.53	2.19	6.32	6.32	2.39	6.08	6.08	2.60	5.81	5.81	2.82	5.51	5.51	3.05	
38EYX03690 Outdoor Section With FX4CSX036 Indoor Section	22	11.22	5.99	2.69	10.93	5.91	2.95	10.70	5.87	3.20	10.31	5.76	3.46	9.88	5.60	3.74	9.40	5.43	4.04	8.87	5.24	4.35	
	20	10.76	7.22	2.66	10.46	7.19	2.92	10.08	7.07	3.17	9.66	6.91	3.43	9.20	6.74	3.71	8.70	6.55	4.01	8.17	6.34	4.32	
	18	10.21	8.52	2.63	9.77	8.37	2.90	9.37	8.20	3.15	8.93	8.02	3.41	8.46	7.80	3.69	7.95	7.56	3.99	7.44	7.30	4.30	
	16	9.58	9.58	2.62	9.23	9.23	2.89	8.90	8.90	3.14	8.56	8.56	3.40	8.19	8.19	3.68	7.80	7.80	3.98	7.39	7.39	4.29	
560	22	11.29	6.16	2.74	11.01	6.10	3.00	10.73	6.03	3.25	10.42	5.99	3.51	9.98	5.85	3.79	9.49	5.69	4.09	8.97	5.50	4.40	
	20	10.86	7.54	2.71	10.59	7.56	2.97	10.22	7.46	3.22	9.79	7.32	3.48	9.33	7.16	3.76	8.84	6.99	4.06	8.29	6.77	4.37	
	18	10.36	9.04	2.68	9.94	8.91	2.95	9.54	8.76	3.20	9.10	8.56	3.46	8.63	8.34	3.74	8.17	8.10	4.03	7.70	7.70	4.35	
	16	9.92	9.92	2.67	9.58	9.58	2.94	9.25	9.25	3.19	8.90	8.90	3.45	8.53	8.53	3.74	8.14	8.14	4.03	7.70	7.70	4.35	
640	22	11.33	6.31	2.78	11.06	6.28	3.05	10.77	6.21	3.30	10.49	6.21	3.56	10.04	6.07	3.84	9.55	5.92	4.14	9.02	5.74	4.45	
	20	10.52	7.13	2.77	10.66	7.88	3.02	10.31	7.83	3.27	9.89	7.71	3.53	9.43	7.56	3.81	8.92	7.38	4.11	8.38	7.18	4.42	
	18	10.47	9.49	2.73	10.08	9.40	2.99	9.67	9.24	3.24	9.25	9.03	3.51	8.79	8.79	3.79	8.38	8.38	4.09	7.95	7.95	4.40	
	16	10.18	10.18	2.72	9.85	9.85	2.99	9.52	9.52	3.24	9.17	9.17	3.50	8.80	8.80	3.79	8.39	8.39	4.08	7.95	7.95	4.40	
38EYX04890 Outdoor Section With FX4CSX048 Indoor Section	22	14.88	7.76	3.61	14.46	7.59	4.07	14.19	7.53	4.48	13.63	7.30	4.92	13.06	7.08	5.38	12.41	6.82	5.86	11.69	6.53	6.34	
	20	14.47	9.30	3.59	14.16	9.26	4.03	13.69	9.09	4.45	13.17	8.87	4.89	12.61	8.65	5.35	11.98	8.39	5.82	11.28	8.10	6.31	
	18	14.05	11.07	3.56	13.59	10.94	4.01	13.11	10.73	4.43	12.59	10.52	4.87	12.03	10.29	5.32	11.41	10.03	5.79	10.72	9.72	6.27	
	16	13.42	12.72	3.55	12.93	12.50	4.00	12.46	12.24	4.42	11.96	11.96	4.85	11.48	11.48	5.31	10.96	10.96	5.78	10.40	10.40	6.25	
730	22	14.94	7.87	3.66	14.50	7.71	4.12	14.21	7.64	4.53	13.67	7.45	4.97	13.09	7.22	5.43	12.44	6.95	5.91	11.71	6.67	6.39	
	20	14.54	9.51	3.64	14.21	9.48	4.09	13.77	9.34	4.50	13.23	9.12	4.94	12.67	8.90	5.40	12.03	8.65	5.88	11.32	8.36	6.36	
	18	14.13	11.41	3.62	13.71	11.36	4.06	13.22	11.14	4.48	12.69	10.93	4.92	12.13	10.71	5.37	11.51	10.45	5.84	10.81	10.13	6.32	
	16	13.59	13.23	3.60	13.11	13.01	4.05	12.66	12.66	4.46	12.22	12.22	4.90	11.74	11.74	5.36	11.21	11.21	5.83	10.62	10.62	6.31	
800	22	14.99	8.04	3.74	14.54	7.89	4.20	14.17	7.76	4.61	13.72	7.66	5.05	13.11	7.41	5.51	12.46	7.15	5.99	11.74	6.87	6.48	
	20	14.61	9.82	3.72	14.23	9.78	4.17	13.86	9.73	4.58	13.30	9.50	5.02	12.72	9.29	5.49	12.08	9.04	5.96	11.36	8.75	6.44	
	18	14.17	11.84	3.70	13.83	11.99	4.15	13.33	11.76	4.56	12.80	11.55	5.00	12.24	11.32	5.45	11.61	11.03	5.92	10.91	10.67	6.40	
	16	13.80	13.80	3.67	13.38	13.38	4.13	12.97	12.97	4.55	12.51	12.51	4.98	12.02	12.02	5.44	11.47	11.47	5.92	10.85	10.85	6.40	
38EYX06090 Outdoor Section With FX4CSX060 Indoor Section	22	19.59	10.37	5.21	18.78	10.03	5.65	18.04	9.76	6.05	17.22	9.43	6.46	16.37	9.08	6.90	15.41	8.68	7.34	14.27	8.17	7.78	
	20	18.56	12.34	5.15	17.75	12.03	5.59	17.06	11.73	5.98	16.31	11.42	6.40	15.49	11.07	6.83	14.62	10.70	7.27	13.64	10.25	7.71	
	18	17.25	14.22	5.11	16.58	13.92	5.53	15.89	13.61	5.93	15.19	13.29	6.34	14.40	12.94	6.77	13.58	12.56	7.21	12.73	12.13	7.64	
	16	16.14	15.94	5.08	15.51	15.51	5.51	14.98	14.98	5.91	14.43	14.43	6.32	13.82	13.82	6.75	13.18	13.18	7.19	12.48	12.48	7.64	
875	22	19.64	10.44	5.24	18.82	10.10	5.67	18.08	9.83	6.07	17.25	9.50	6.49	16.39	9.14	6.92	15.40	8.74	7.36	14.28	8.22	7.80	
	20	18.61	12.48	5.18	17.81	12.16	5.61	17.10	11.86	6.01	16.35	11.55	6.42	15.53	11.20	6.85	14.66	10.82	7.29	13.66	10.35	7.74	
	18	17.32	14.40	5.13	16.64	14.11	5.55	15.95	13.79	5.96	15.24	13.48	6.37	14.45	13.12	6.80	13.63	12.73	7.23	12.76	12.29	7.67	
	16	16.22	16.19	5.10	15.64	15.64	5.52	15.10	15.10	5.93	14.55	14.55	6.34	13.93	13.93	6.78	13.28	13.28	7.22	12.58	12.58	7.66	
900	22	19.67	10.51	5.26	18.85	10.17	5.69	18.10	9.90	6.09	17.27	9.57	6.51	16.41	9.20	6.94	15.41	8.79	7.38	14.28	8.27	7.83	
	20	18.67	12.60	5.20	17.86	12.29	5.63	17.15	11.99	6.03	16.39	11.67	6.44	15.57	11.32	6.88	14.69	10.94	7.31	13.68	10.46	7.76	
	18	17.38	14.59	5.15	16.70	14.29	5.58	16.00	13.97	5.98	15.29	13.65	6.39	14.51	13.29	6.82	13.68	12.89	7.25	12.81	12.44	7.69	
	16	16.32	16.32	5.12	15.76	15.76	5.55	15.22	15.22	5.95	14.66	14.66	6.36	14.04	14.04	6.80	13.38	13.38	7.24	12.67	12.67	7.69	

* Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per ARI standard 210/240-94. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 27°C entering air at the indoor coil. For sensible capacities at other than 27°C, deduct 245 W per 480 l/s of indoor coil air for each degree below 27°C, or add 245 kW per 480 l/s of indoor coil air per degree above 27°C.

** System kW is total of indoor and outdoor unit kilowatts.

EWB - Entering wet bulb temperature, °C

TC - Total cooling capacity, kW

SC - Sensible capacity, kW

kW - System power input

Heat pump heating performance*

Indoor air		Outdoor coil entering air temperature, °C																							
EDB	Air flow	-16			-8			0			4			8			12			16			20		
°C	l/s	TC	TCl	kW	TC	TCl	kW	TC	TCl	kW	TC	TCl	kW	TC	TCl	kW	TC	TCl	kW	TC	TCl	kW	TC	TCl	kW
38EYX 02470 Outdoor section with FX4CSX 024 indoor section																									
12	330	3.61	3.32	1.28	4.71	4.29	1.37	5.90	5.12	1.48	6.31	6.16	1.52	6.66	6.66	1.57	6.78	6.78	1.58	6.85	6.85	1.58	6.91	6.91	1.58
	380	3.65	3.36	1.27	4.76	4.33	1.36	5.79	5.02	1.44	6.13	5.98	1.48	6.23	6.23	1.49	6.27	6.27	1.49	6.30	6.30	1.49	6.30	6.30	1.49
	425	3.69	3.39	1.27	4.80	4.37	1.35	5.69	4.93	1.43	5.89	5.75	1.45	5.89	5.89	1.45	5.90	5.90	1.45	5.89	5.89	1.45	5.56	5.56	1.43
15	330	3.54	3.26	1.37	4.64	4.23	1.46	5.92	5.13	1.59	6.38	6.22	1.64	6.77	6.77	1.69	7.08	7.08	1.73	7.19	7.19	1.73	7.29	7.29	1.74
	380	3.58	3.30	1.36	4.69	4.27	1.45	5.85	5.07	1.55	6.23	6.08	1.60	6.52	6.52	1.63	6.60	6.60	1.64	6.65	6.65	1.64	6.70	6.70	1.64
	425	3.62	3.33	1.36	4.73	4.31	1.44	5.77	5.00	1.53	6.10	5.95	1.57	6.19	6.19	1.58	6.23	6.23	1.58	6.26	6.26	1.58	6.25	6.25	1.58
18	330	3.47	3.20	1.47	4.58	4.17	1.57	5.87	5.09	1.70	6.42	6.26	1.76	6.85	6.85	1.82	7.27	7.27	1.87	7.49	7.49	1.90	7.62	7.62	1.91
	380	3.52	3.23	1.45	4.62	4.21	1.55	5.88	5.10	1.66	6.31	6.15	1.71	6.67	6.67	1.76	6.88	6.88	1.78	6.97	6.97	1.79	7.06	7.06	1.80
	425	3.55	3.27	1.45	4.66	4.25	1.54	5.83	5.05	1.64	6.19	6.04	1.69	6.45	6.45	1.72	6.53	6.53	1.72	6.58	6.58	1.73	6.62	6.62	1.73
21	330	3.41	3.14	1.56	4.51	4.11	1.67	5.80	5.03	1.83	6.43	6.28	1.88	6.90	6.90	1.95	7.36	7.36	2.01	7.74	7.74	2.06	7.90	7.90	2.08
	380	3.45	3.17	1.55	4.56	4.15	1.65	5.84	5.06	1.78	6.35	6.20	1.84	6.76	6.76	1.89	7.13	7.13	1.94	7.25	7.25	1.95	7.42	7.42	1.97
	425	3.48	3.20	1.55	4.59	4.18	1.64	5.85	5.07	1.76	6.26	6.11	1.81	6.62	6.62	1.85	6.79	6.79	1.87	6.87	6.87	1.88	6.94	6.94	1.88
24	330	3.35	3.08	1.66	4.44	4.05	1.78	5.72	4.95	1.94	6.40	6.25	2.01	6.92	6.92	2.08	7.42	7.42	2.15	7.86	7.86	2.22	8.11	8.11	2.20
	380	3.38	3.11	1.66	4.49	4.09	1.76	5.77	5.00	1.91	6.38	6.22	1.96	6.82	6.82	2.02	7.24	7.24	2.08	7.49	7.49	2.11	7.63	7.63	2.12
	425	3.41	3.14	1.65	4.53	4.13	1.75	5.80	5.03	1.88	6.31	6.16	1.93	6.70	6.70	1.98	7.02	7.02	2.02	7.13	7.13	2.03	7.24	7.24	2.04
38EYX 03690 Outdoor section with FX4CSX 036 indoor section																									
12	500	5.29	4.87	1.96	6.91	6.30	2.15	8.83	7.65	2.40	9.84	9.60	2.51	10.71	10.71	2.63	11.58	11.58	2.76	12.43	12.43	2.89	13.25	13.25	3.01
	560	5.35	4.92	1.98	6.99	6.37	2.15	8.90	7.71	2.38	9.76	9.53	2.48	10.53	10.53	2.58	11.30	11.30	2.70	12.05	12.05	2.80	12.77	12.77	2.91
	640	5.42	4.98	2.00	7.06	6.43	2.16	8.90	7.71	2.37	9.65	9.42	2.47	10.35	10.35	2.56	11.06	11.06	2.66	11.73	11.73	2.75	12.24	12.24	2.82
15	500	5.19	4.77	2.08	6.81	6.20	2.27	8.71	7.54	2.53	9.77	9.53	2.67	10.73	10.73	2.79	11.64	11.64	2.93	12.54	12.54	3.08	13.41	13.41	3.21
	560	5.27	4.85	2.08	6.89	6.27	2.27	8.79	7.62	2.52	9.77	9.53	2.63	10.59	10.59	2.74	11.41	11.41	2.86	12.21	12.21	2.98	12.97	12.97	3.09
	640	5.33	4.90	2.11	6.96	6.34	2.28	8.85	7.67	2.51	9.70	9.47	2.61	10.44	10.44	2.71	11.20	11.20	2.82	11.92	11.92	2.93	12.61	12.61	3.03
18	500	5.10	4.69	2.21	6.71	6.11	2.40	8.58	7.43	2.66	9.65	9.41	2.83	10.70	10.70	2.96	11.68	11.68	3.11	12.62	12.62	3.26	13.52	13.52	3.41
	560	5.17	4.75	2.21	6.79	6.18	2.40	8.67	7.51	2.65	9.71	9.48	2.78	10.62	10.62	2.90	11.49	11.49	3.04	12.34	12.34	3.17	13.13	13.13	3.28
	640	5.24	4.81	2.22	6.86	6.24	2.40	8.74	7.58	2.66	9.70	9.47	2.76	10.51	10.51	2.87	11.31	11.31	3.00	12.08	12.08	3.11	12.81	12.81	3.21
21	500	5.02	4.61	2.33	6.61	6.02	2.54	8.45	7.33	2.80	9.51	9.28	2.98	10.63	10.63	3.13	11.68	11.68	3.29	12.66	12.66	3.46	13.61	13.61	3.61
	560	5.08	4.67	2.34	6.69	6.09	2.53	8.54	7.40	2.79	9.60	9.37	2.96	10.62	10.62	3.07	11.55	11.55	3.22	12.43	12.43	3.36	13.28	13.28	3.49
	640	5.15	4.73	2.35	6.76	6.15	2.53	8.62	7.47	2.79	9.65	9.42	2.92	10.54	10.54	3.04	11.39	11.39	3.17	12.21	12.21	3.30	12.98	12.98	3.41
24	500	4.93	4.54	2.47	6.50	5.92	2.68	8.33	7.22	2.96	9.37	9.15	3.13	10.50	10.50	3.32	11.64	11.64	3.48	12.66	12.66	3.65	13.64	13.64	3.82
	560	5.00	4.59	2.47	6.57	5.99	2.67	8.42	7.30	2.93	9.47	9.24	3.11	10.57	10.57	3.25	11.56	11.56	3.40	12.48	12.48	3.55	13.37	13.37	3.69
	640	5.06	4.65	2.49	6.65	6.05	2.67	8.50	7.37	2.93	9.55	9.31	3.10	10.55	10.55	3.21	11.44	11.44	3.35	12.30	12.30	3.49	13.11	13.11	3.61
38EYX 04890 Outdoor section with FX4CSX 048 indoor section																									
12	650	7.82	7.19	2.66	9.81	8.93	2.77	12.30	10.66	2.96	13.69	13.36	3.09	15.22	15.22	3.25	16.94	16.94	3.41	18.56	18.56	3.57	20.13	20.13	3.76
	730	7.88	7.24	2.64	9.88	9.00	2.74	12.39	10.74	2.90	13.80	13.47	3.02	15.35	15.35	3.17	16.99	16.99	3.28	18.49	18.49	3.43	19.96	19.96	3.59
	800	7.96	7.33	2.64	9.98	9.09	2.71	12.53	10.86	2.85	13.96	13.62	3.06	15.48	15.48	3.06	16.94	16.94	3.16	18.28	18.28	3.28	19.62	19.62	3.42
15	650	7.74	7.12	2.88	9.72	8.86	3.01	12.19	10.56	3.21	13.55	13.22	3.34	15.04	15.04	3.51	16.76	16.76	3.71	18.45	18.45	3.85	20.05	20.05	4.05
	730	7.80	7.18	2.87	9.79	8.92	2.97	12.27	10.64	3.15	13.65	13.33	3.27	15.17	15.17	3.42	16.86	16.86	3.56	18.45	18.45	3.71	19.95	19.95	3.88
	800	7.90	7.26	2.86	9.90	9.02	2.94	12.41	10.75	3.09	13.81	13.48	3.20	15.34	15.34	3.34	16.89	16.89	3.42	18.31	18.31	3.55	19.70	19.70	3.69
18	650	7.64	7.03	3.10	9.65	8.79	3.26	12.07	10.46	3.47	13.40	13.08	3.61	14.86	14.86	3.77	16.55	16.55	3.99	18.30	18.30	4.15	19.94	19.94	4.35
	730	7.71	7.09	3.09	9.72	8.85	3.22	12.16	10.54	3.41	13.51	13.19	3.53	14.99	14.99	3.68	16.69	16.69	3.86	18.35	18.35	4.00	19.90	19.90	4.18
	800	7.81	7.18	3.09	9.82	8.95	3.18	12.29	10.65	3.34	13.66	13.33	3.45	15.17	15.17	3.59	16.80	16.80	3.70	18.30	18.30	3.83	19.72	19.72	3.98
21	650	7.51	6.91	3.32	9.56	8.71	3.48	11.91	10.32	3.72	13.26	12.94	3.88	14.69	14.69	4.05	16.34	16.34	4.27	18.12	18.12	4.46	19.79	19.79	4.66
	730	7.58	6.98	3.31	9.64	8.78	3.47	12.00	10.40	3.66	13.36	13.04	3.80	14.82	14.82	3.95	16.49	16.49	4.16	18.21	18.21	4.29	19.81	19.81	4.48
	800	7.70	7.08	3.31	9.74	8.87	3.43	12.17	10.55	3.61	13.52	13.19	3.72	14.99	14.99	3.86	16.66	16.66	3.99	18.24	18.24	4.12	19.71	19.71	4.28
24	650	7.34	6.75	3.52	9.47	8.63	3.76	11.77	10.20	3.99	13.11	12.80	4.16	14.52	14.52	4.33	16.12	16.12	4.56	17.88	17.88	4.77	19.62	19.62	4.97
	730	7.42	6.83	3.52	9.54	8.69	3.70	11.87	10.28	3.93	13.22	12.90	4.08	14.64	14.64	4.24	16.28	16.28	4.44	18.04	18.04	4.61	19.67	19.67	4.79
	800	7.55	6.94	3.52	9.65	8.79	3.66	12.01	10.41	3.86	13														

Indoor unit cooling capacities, kW

Unit size	l/s BF	Coil refrigerant temperature*, °C																							
		2				4				6				8				10				12			
		Evaporator air entering wet-bulb temperature, °C																							
		22	20	18	16	22	20	18	16	22	20	18	16	22	20	18	16	22	20	18	16	22	20	18	16
024	350 TC	13.8	12.1	10.6	9.1	12.9	11.1	9.5	8.0	11.9	10.0	8.4	7.0	10.8	8.9	7.4	5.9	9.5	7.6	6.2	4.9	8.1	6.3	5.3	4.4
	0.04 SC	6.8	7.2	7.5	7.7	6.4	6.8	7.1	7.3	5.9	6.2	6.5	6.7	5.4	5.7	5.9	5.9	4.8	5.2	5.4	4.9	4.4	4.6	4.7	4.4
	475 TC	15.9	14.0	12.1	10.3	14.8	12.8	11.0	9.3	13.6	11.6	9.8	8.1	12.3	10.3	8.6	7.0	10.9	8.9	7.4	6.1	9.2	7.2	6.1	5.5
	0.07 SC	7.7	8.3	8.9	9.4	7.3	7.8	8.3	8.8	6.9	7.3	7.7	8.1	6.4	6.8	7.1	7.0	5.7	6.1	6.4	6.1	5.2	5.5	5.7	5.5
	525 TC	16.7	14.6	12.7	10.8	15.6	13.4	11.5	9.8	14.4	12.1	10.3	8.6	13.0	10.7	9.0	7.4	11.5	9.3	7.7	6.5	9.8	7.6	6.5	5.8
0.08 SC	8.3	8.8	9.3	9.9	7.9	8.3	8.8	9.2	7.4	7.8	8.2	8.6	6.9	7.2	7.5	7.4	6.3	6.5	6.8	6.5	5.6	5.9	6.0	5.8	
036	475 TC	19.8	17.2	14.7	12.2	18.3	15.6	13.1	10.8	16.6	13.9	11.5	9.3	14.9	12.1	9.9	7.9	13.0	10.2	8.2	6.6	10.9	8.3	6.9	6.0
	0.05 SC	9.4	10.0	10.5	10.9	8.8	9.2	9.7	10.1	8.1	8.6	8.9	9.2	7.4	7.8	8.1	7.9	6.6	7.0	7.1	7.1	5.9	6.2	6.3	6.0
	600 TC	22.6	19.7	17.0	14.4	21.0	18.0	15.3	12.7	19.1	16.1	13.5	11.0	17.2	14.1	11.7	9.4	15.1	12.0	9.9	8.2	12.6	9.7	8.3	7.3
	0.07 SC	11.0	11.7	12.3	13.0	10.3	10.9	11.5	12.1	9.5	10.1	10.6	11.0	8.7	9.3	9.7	9.4	7.8	8.4	8.7	8.2	7.0	7.4	7.6	7.3
	700 TC	24.5	21.4	18.6	15.8	22.8	19.7	16.8	13.9	21.0	17.6	14.8	12.1	18.9	15.4	12.8	10.5	16.6	13.2	11.0	9.3	14.0	10.8	9.2	8.3
0.09 SC	11.9	12.9	13.7	14.5	11.3	12.1	12.8	13.4	10.4	11.2	11.8	12.1	9.6	10.3	10.8	10.5	8.7	9.4	9.7	9.3	7.9	8.4	8.5	8.3	
048	575 TC	23.5	20.5	17.8	15.2	21.8	18.8	16.0	13.3	19.9	16.9	14.2	11.6	18.0	15.0	12.4	10.0	16.1	12.9	10.6	8.7	13.5	10.5	8.8	7.7
	0.05 SC	11.3	12.0	12.7	13.3	10.5	11.3	11.9	12.4	9.8	10.5	11.1	11.5	9.1	9.7	10.1	10.0	8.2	8.7	9.1	8.7	7.4	7.8	8.0	7.7
	750 TC	26.7	23.3	20.3	17.6	25.0	21.6	18.5	15.6	22.9	19.6	16.6	13.8	20.7	17.3	14.6	12.1	18.4	14.8	12.6	10.9	15.7	12.2	10.6	9.7
	0.07 SC	13.0	14.0	15.0	16.0	12.3	13.4	14.2	14.9	11.5	12.5	13.3	13.8	10.7	11.5	12.3	12.1	9.8	10.7	11.2	10.9	8.7	9.4	9.8	9.7
	825 TC	27.6	24.4	21.2	18.1	25.9	22.5	19.5	16.5	23.8	20.4	17.3	14.5	21.6	18.0	15.2	12.8	19.3	15.5	13.2	11.5	16.4	12.7	11.1	10.4
0.08 SC	13.6	14.8	16.0	17.0	12.7	14.0	15.1	16.2	12.0	13.2	14.1	14.5	11.3	12.3	13.0	12.8	10.4	11.3	11.8	11.5	9.4	10.1	10.5	10.4	
060	600 TC	25.7	22.1	19.0	16.1	23.6	20.2	17.2	14.2	21.6	18.2	15.1	12.2	19.5	16.0	13.0	10.1	17.0	13.7	10.8	8.1	14.3	11.0	9.0	7.5
	0.03 SC	12.4	13.0	13.4	13.8	11.5	12.0	12.4	12.8	10.7	11.1	11.4	11.7	9.8	10.2	10.4	10.1	8.7	9.1	9.1	8.1	7.7	8.1	8.1	7.5
	750 TC	29.6	25.8	22.3	18.9	27.5	23.7	20.2	16.8	25.2	21.3	17.7	14.2	22.8	18.8	15.2	11.8	20.2	16.2	13.0	10.0	17.1	13.1	10.8	9.2
	0.05 SC	14.4	15.3	16.0	16.6	13.4	14.2	14.9	15.6	12.5	13.2	13.7	14.1	11.6	12.2	12.4	11.8	10.5	11.1	11.2	10.0	9.2	9.9	9.9	9.2
	900 TC	32.6	28.5	24.7	21.0	30.3	26.2	22.3	18.6	27.8	23.7	19.8	16.0	25.2	21.0	17.2	13.7	22.4	18.0	14.6	11.8	19.0	14.7	12.3	10.7
0.06 SC	15.9	17.1	18.1	19.1	14.9	16.1	16.9	17.7	13.9	14.9	15.7	16.0	12.8	13.7	14.3	13.7	11.8	12.5	12.6	11.8	10.5	11.3	11.3	10.7	

l/s - Litres per second
 BF - Bypass factor
 TC - Total cooling capacity, kW
 SC - Sensible heat capacity, kW

Notes:

- Gross capacities shown do not include a deduction for evaporator fan motor heat.
- Contact Carrier for cooling capacities at conditions other than shown in table.
- Direct interpolation is permissible. Do not extrapolate.
- SHC is based on 26.7°C temperature of air entering the indoor unit. At any other temperature, correct the SHC read from the table of cooling capacities as follows:
 Corrected SHC kW = SHC + [1.23 x 10⁻³ x (1-BF) x (Cdb-26.7) x l/s] Observe the rule of signs. Above 26.7°C, SHC correction will be positive; add it to SHC. Below 26.7°C, SHC correction will be negative; subtract it from SHC.

5. Formula:

$$Cl_{db} = C_{ed}b - \frac{SHC_{kW}}{1.23 \times 10^{-3} \times (l/s)}$$

Leaving wet bulb = wet bulb temperature corresponding to enthalpy of air leaving coil (hlwb).

$$hlwb = h_{ewb} - \frac{TC_{kW}}{1.20 \times 10^{-3} \times (l/s)}$$

Where h_{ewb} is enthalpy of air entering evaporator coil (kJ/kg).

Combination ratings

38EYX size	FX4CSX size	Nominal air flow l/s	Cooling capacity at 35°C		Heating capacity at 7°C	
			Rated capacity kW	Rated EER W/W	Rated capacity kW	COP W/W
024-70	024	380	6.83	3.22	6.64	3.63
036-90	036	560	9.98	3.18	10.39	3.49
048-90	048	730	13.66	3.13	14.48	3.79
060-90	060	875	16.73	2.85	17.07	3.39

Notes:

Ratings are net values reflecting the effects of circulating fan heat. Supplemental electric heat is not included. Ratings are based on:

Cooling standard: 27°C db/19°C wb indoor entering air temperature and 35°C db air entering outdoor unit.

High-temperature heating standard: 20° db indoor entering air temperature and 7°C db/6°C wb air entering outdoor unit.

System Design

- Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 2.5 Pa.
- Minimum outdoor operating air temperature for cooling mode without low-ambient operation accessory is 13°C.
- Maximum outdoor operating air temperature for cooling mode is 52°C.
- Minimum outdoor operating air temperature for heating mode is -34°C.
- Maximum outdoor operating air temperature for heating mode is 19°C.
- For reliable operation, unit should be level in all horizontal planes.
- Maximum elevation of indoor coil above or below base of outdoor unit is: indoor coil above = 15 m, indoor coil below = 45 m. (See items 8 and 9 following.)
- For interconnecting refrigerant tube lengths greater than 15.2 m, consult Long-Line Application Guideline available from equipment distributor.
- Not more than 90 mm of refrigerant tube should be buried in the ground. If necessary to bury tubes under a sidewalk, provide a minimum 150 mm) vertical rise to the valve connections at the unit.
- Use only copper wire for electric connection at unit. Aluminium and clad aluminium wires are not acceptable for the type of connector provided.

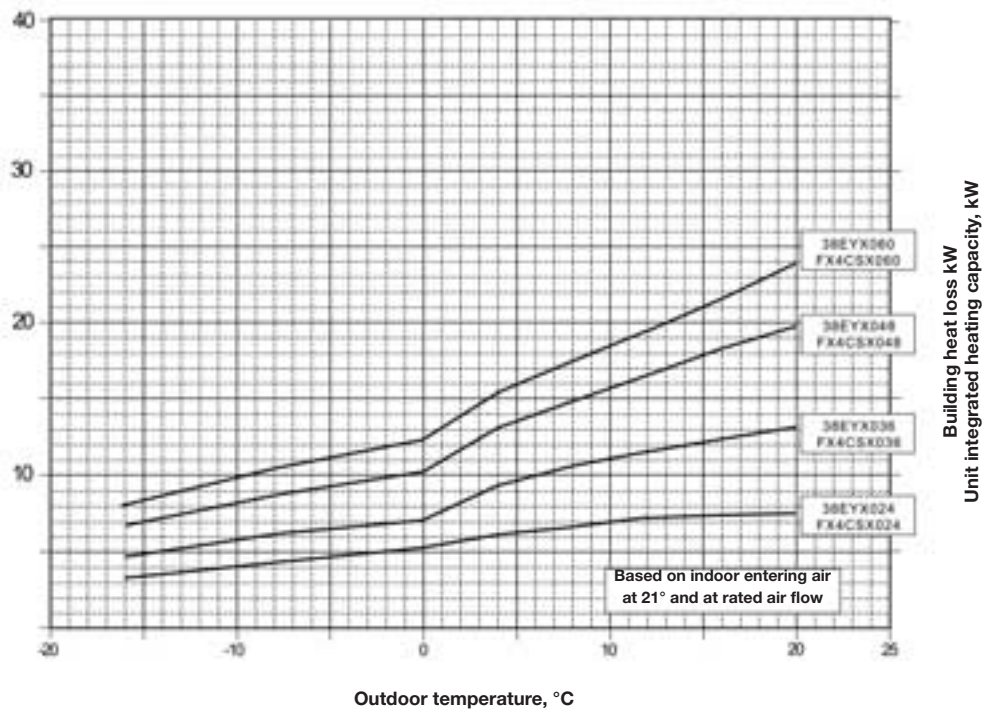
Indoor unit air flow performance - air flow rate, l/s

Unit size	Fan motor speed	External static pressure, Pa				
		25	50	75	100	125
024	High	519	482	431	369	299
	Medium	462	429	385	321	-
	Low	415	386	340	-	-
036	High	692	658	619	571	478
	Medium	612	581	544	496	-
	Low	511	494	472	439	-
048	High	812	765	716	661	595
	Medium	770	724	678	628	-
	Low	713	671	630	579	-
060	High	885	844	800	755	706
	Medium	803	767	731	690	-
	Low	671	647	624	-	-

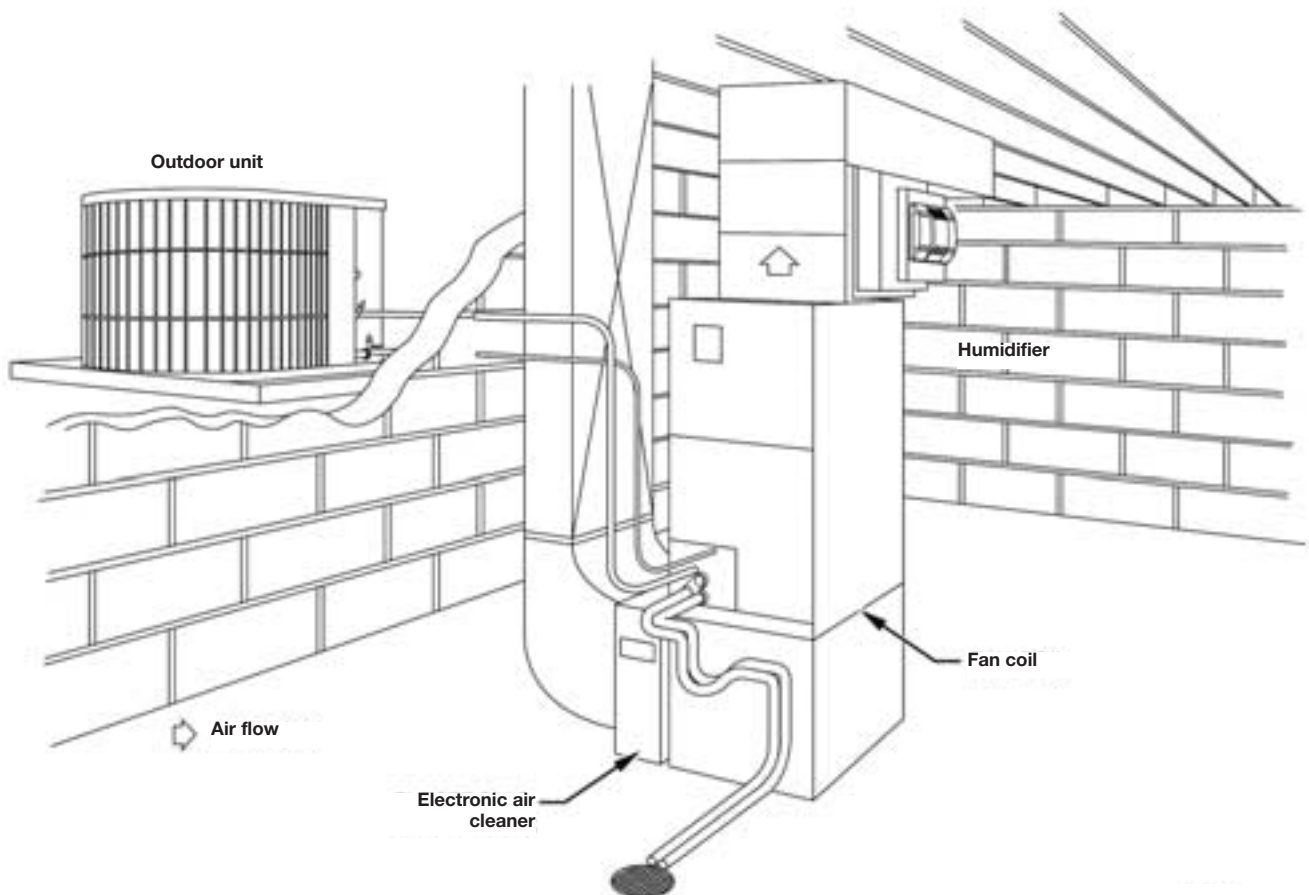
Notes:

Fan performance based on wet coil with factory-supplied filter; no internal heaters. Not recommended for use above 150 Pa external static pressure.

38EYX Balance point worksheet



Typical installation diagram



Indoor unit application data

Install these units in the conditioned space or in an unconditioned space. They are tested and approved for installation in unconditioned spaces per ARI Standards (27°C db, 24°C wb indoor temperature; 27°C db outdoor temperature). Insulate supply and return air ductwork in the unconditioned space. It is recommended that insulation with vapour barrier be used.

Sound-For acoustical treatment of ductwork, see FX4C Installation, Start-Up, and Service Instructions.

Outdoor unit guide specifications

Air-cooled, split-system heat pump 38EYX
Nominal cooling capacity 6.8 to 16.7 kW
Nominal heating capacity 6.6 to 17.1 kW

General

System description

Outdoor-mounted, air-cooled, split-system heat pump unit, suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit will discharge supply air upward, as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.

Quality assurance

Unit shall be manufactured in a facility registered to ISO9001/BS5750 Part II, International Standard for Quality Systems. Unit design shall comply with European standards and bear the CE Mark.

Unit will be rated in accordance with Eurovent standards.

Unit will be constructed in accordance with applicable standards.

Unit cabinet will be capable of withstanding a 500-hour salt spray test.

Air-cooled condenser coils will be leak tested at 1724 kPa and pressure tested at 3103 kPa.

Delivery, storage, and handling

Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Products

Equipment

Factory-assembled, single piece, air-cooled heat pump unit. Contained within the unit enclosure will be all factory wiring, piping, controls, compressor, refrigerant charge (R-410A), and special features required prior to field start-up.

Unit cabinet

Unit cabinet will be constructed of galvanised steel, bonderised, and coated with a powder coat paint.

Fans

Condenser fan will be direct-drive propeller type, discharging air upward. Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant. Fan blades will be statically and dynamically balanced. Condenser fan openings will be equipped with PVC-coated steel wire safety guards.

Compressor

Compressor will be hermetically sealed. Compressor will be mounted on rubber vibration isolators.

Condenser coil

Condenser coil will be air-cooled. Coil will be constructed of aluminium fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

Refrigeration components

Refrigeration circuit components will include liquid line shutoff valve with sweat connections, suction shutoff valves with sweat connections, system charge of refrigerant R-410A, compressor oil, accumulator, and reversing valve.

Operating characteristics

The capacity of the unit will meet or exceed ____ kW at a suction temperature of ____ °C. The power consumption at full load will not exceed ____ kW. Combination of the unit and the evaporator or fan coil unit will have a total net cooling capacity of ____ kW or greater at conditions of ____ l/s entering air temperature at the evaporator at ____ °C wet bulb and ____ °C dry bulb, and air entering the unit at ____ °C.

Electrical requirements

Nominal unit electrical characteristics will be ____ V, 1 or 3 phase, 50 Hz. The unit will be capable of satisfactory operation within voltage limits of ____ V to ____ V. Unit electrical power will be single point connection. Control circuit will be 24 V.

Special features

Refer to section of this literature identifying accessories and descriptions for specific features and available enhancements.

