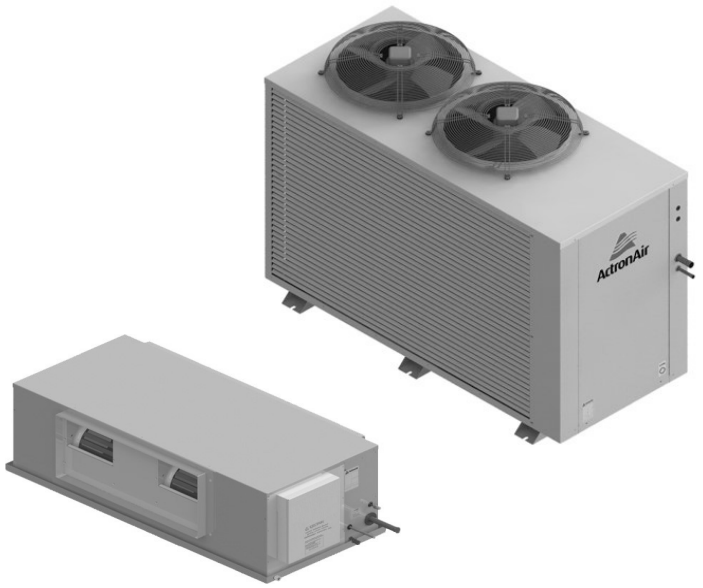
Standard Commercial Split/Package Unit

Troubleshooting Guide



Split

Indoor		Outdoor
SCA300E	SCG260E	SCA260C
SCA330E	SCG290E	SCA290C
SCA340E	SCG330E	SCA300C
SCA400E	SCG340E	SCA330C
	SCG400E	SCA340C
		SCA400C
	EVA300S*	CRA300T*

Package

Under / Over			Left / Right Handing
PCA260U/V	PCG153U/V	PCG330U/V	PCG290L/R
PCA290U/V	PCG173U/V	PCG340U/V	PCG300L/R
PCA300U/V	PCG203U/V	PCG400U/V	PCG330L/R
PCA330U/V	PCG233U/V		PCG340L/R
PCA340U/V	PCG260U/V		PCG400L/R
PCA400U/V	PCG290U/V		
			PKA300T-L/R*

IMPORTANT NOTE:
Please read this manual carefully before installing or operating your air conditioning unit.

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01. Fault Finding Guide

FAULT	POSSIBLE CAUSES	REMEDIES
The system does not start.	Built-in safety timers have been activated.	Ensure that 5 minutes has passed from turn on time.
	A breaker has turned OFF or a fuse has blown.	Check breakers and fuses.
	The thermostat set point is incorrect.	Check the wall control settings are correct. Check that the thermostat set point is set low enough for cooling or high enough for heating.
	The master wall controller timer setting is incorrect.	Check the master wall controller timer settings. See Operating Instructions section.
Air does not flow (Indoor unit).	During heating operation, the hot start function may have been activated.	During heating operation, the indoor fan is delayed for 60 seconds. This is to prevent cold drafts. Wait for 60 seconds and the air will start flowing.
	During defrost of the outdoor coil in heating operation; the indoor fan will not operate for several minutes (Defrost operation is indicated by flashing the heat light every second).	This is normal operation during the defrost cycle to prevent cold air from being blown into the rooms.
Cooling/Heating is not sufficient.	The cooling/heating function may not work effectively when the return air filter is clogged with dust and dirt.	Clean the return air filter.
	The cooling/heating function may not work effectively if the air inlet and air outlet on the outdoor unit are blocked.	Make sure the air inlet and air outlet on the outdoor unit is not blocked. Check that the area around the outdoor unit is free from obstructions that may cause the airflow to recirculate.
	The airflow across the indoor coil may not be enough and lead to tripping the compressor either on Low Pressure or Hight Pressure.	Reduce the total static pressure on the indoor fan to increase airflow. For example increase duct sizes, reduce tight duct work bends or increase return air grille size.
	The cool/heat load is too great for the air conditioner.	Perform a heat load analysis on the conditioned space. You may need to consider upgrading your air conditioner with a larger system.
	Open windows or doors will cause inefficient operation.	Close windows and doors in conditioned areas.
	The outside temperature is beyond the air conditioner design conditions.	If you know an extreme day is coming turn the air conditioner on a few hours before ambient temperatures reach extreme. This should help on those few extreme days.
Steam emitted from outdoor unit.	This is caused by the defrosting operation of the outdoor units heat exchanger in heating operation in cold ambient conditions.	This is normal during the defrost operation in cold ambient conditions.
	Condensation of water on the outdoor coil during heating operation.	This is normal during heating operation. You can purchase drip trays to contain then drain this excess water.

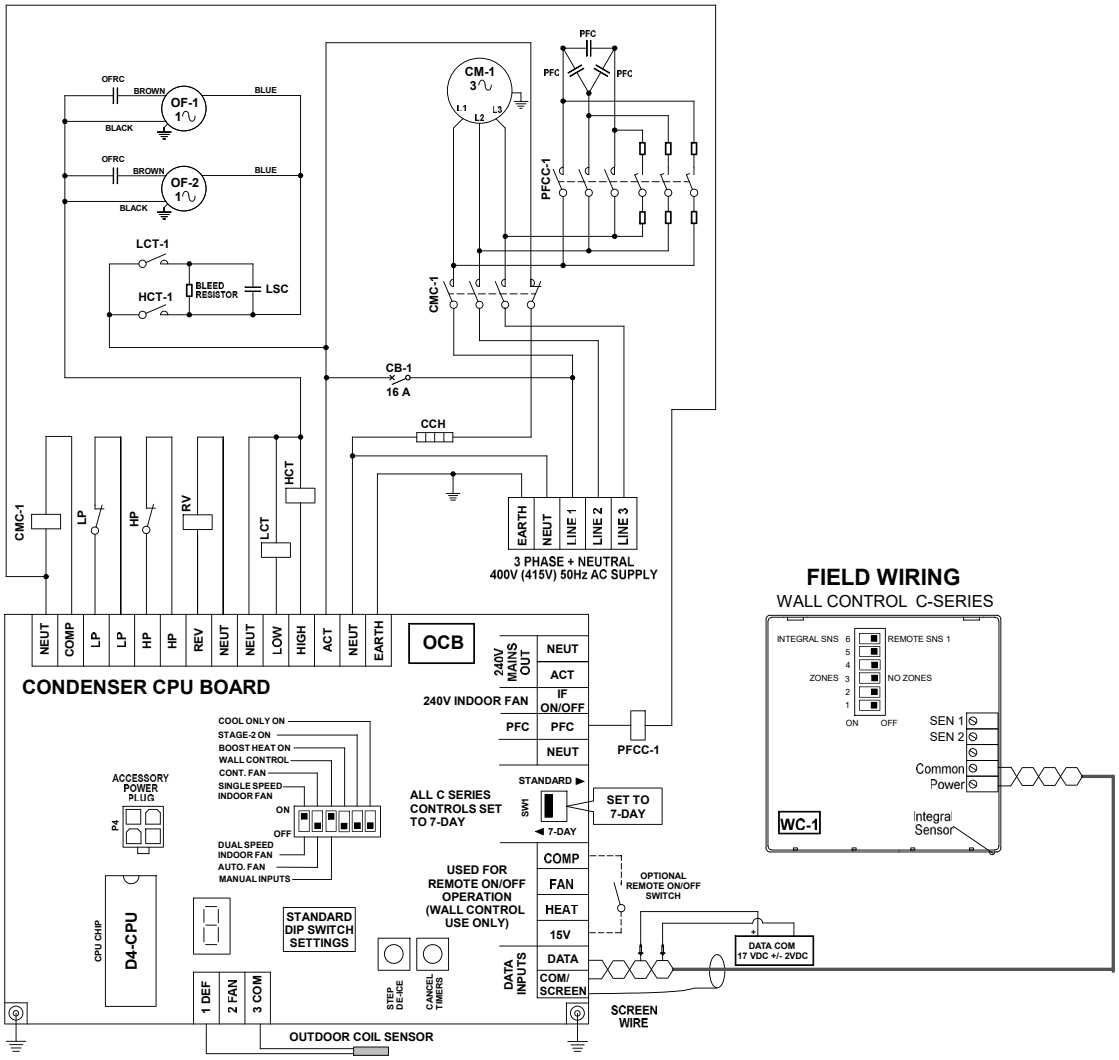
FAULT	POSSIBLE CAUSES	REMEDIES
Set temperature cannot be adjusted.	The wall control set temperature limits are being exceeded.	Check the upper and lower temperature limits are set correctly. See service manual for details on setting upper and lower temperature limits.
Occasional hissing noise can be heard on heating cycle.	This is the sound of the gas changing direction as de-ice cycle begins.	This is a normal function of an air conditioner. The unit is removing any ice on the outdoor unit.
The compressor is running but the system is not cooling.	You are in heating mode.	Check the temperature settings.
	The reversing valve has jammed between heating and cooling.	Replace reversing valve.
The outdoor coil keeps freezing over.	Outdoor coil sensor might be faulty. See sensor (temperature/resistance) table and check resistance value. (See page 5)	Replace faulty sensor.
	May have obstruction in outdoor coil.	Remove obstructions.
There is only one condenser fan working.	The fan is faulty. Test the fan motor for correct voltage, check motor winding resistance, open circuit, check capacitor, etc.	Replace faulty fan. If the fan motor needs to be replaced and there isn't one available immediately, then just disconnect the fan electrically and cover the faulty motors fan guard. This way the unit can still operate at reduced capacity using 1 fan until you get a replacement fan motor.
The system is short on gas. You have fixed the leak and want the system to operate for longer duration, so gas charge can be corrected. What can you do to ensure a longer compressor operation period?	You can adjust your wall controller temperature so you have a large differential. This will operate the system for longer duration till the temperature gets to within 0.5°C of the set point.	Select Cooling or heating mode. If cooling adjust set-points more than 1°C lower than room temp. If Heating adjust set-points more than 1°C higher than room temp. Complete charging procedure until finished.
The indoor unit gives out odour	This happens when smell of the room, furniture, or cigarettes are absorbed into the unit and discharged with the airflow.	If this happens, we recommend you to run the air conditioner on cooling for a period of time with the doors and windows open or have the indoor unit washed by a technician. Consult the installer from whom you bought the air conditioner.
	Check the drain is not piped into the sewerage drain line.	Re-pipe drain with a P-Trap and connect into household drainage or storm water drain.

Temperature versus Resistance Chart for Indoor / Outdoor Coil Sensor (R25 = 10.000 kΩ)

TX (°C)	R (kΩ)	TX (°C)	R (kΩ)	TX (°C)	R (kΩ)	TX (°C)	R (kΩ)	TX (°C)	R (kΩ)
–50	329.2	–16	55.95	18	13.06	52	3.897	86	1.412
–49	310.7	–15	53.39	19	12.56	53	3.772	87	1.374
–48	293.3	–14	50.95	20	12.09	54	3.652	88	1.337
–47	277.0	–13	48.66	21	11.63	55	3.537	89	1.301
–46	261.3	–12	46.48	22	11.20	56	3.426	90	1.266
–45	247.5	–11	44.44	23	10.78	57	3.319	91	1.233
–44	234.1	–10	42.45	24	10.38	58	3.216	92	1.200
–43	221.6	–9	40.56	25	10.00	59	3.116	93	1.169
–42	209.8	–8	38.76	26	9.632	60	3.021	94	1.138
–41	198.7	–7	37.05	27	9.281	61	2.928	95	1.108
–40	188.4	–6	35.43	28	8.944	62	2.838	96	1.080
–39	178.3	–5	33.89	29	8.622	63	2.752	97	1.052
–38	168.9	–4	32.43	30	8.313	64	2.669	98	1.025
–37	160.1	–3	31.04	31	8.015	65	2.589	99	0.9988
–36	151.8	–2	29.72	32	7.725	66	2.512	100	0.9735
–35	144.0	–1	28.47	33	7.455	67	2.437	101	0.9488
–34	136.6	0	27.28	34	7.192	68	2.365	102	0.9250
–33	129.7	1	26.13	35	6.941	69	2.296	103	0.9018
–32	123.2	2	25.03	36	6.699	70	2.229	104	0.8793
–31	117.1	3	23.99	37	6.468	71	2.163	105	0.8575
–30	111.3	4	22.99	38	6.246	72	2.101	106	0.8364
–29	105.7	5	22.05	39	6.033	73	2.040	107	0.8158
–28	100.4	6	21.15	40	5.829	74	1.981	108	0.7960
–27	95.47	7	20.30	41	5.630	75	1.924	109	0.7766
–26	90.80	8	19.48	42	5.439	76	1.870	110	0.7579
–25	86.39	9	18.70	43	5.256	77	1.817	111	0.7396
–24	82.22	10	17.96	44	5.080	78	1.766	112	0.7219
–23	78.29	11	17.24	45	4.912	79	1.716	113	0.7047
–22	74.58	12	16.55	46	4.749	80	1.669	114	0.6880
–21	71.07	13	15.90	47	4.594	81	1.622	115	0.6718
–20	67.74	14	15.28	48	4.444	82	1.577	116	0.6560
–19	64.54	15	14.68	49	4.300	83	1.534	117	0.6407
–18	61.52	16	14.12	50	4.161	84	1.492	118	0.6258
–17	58.65	17	13.57	51	4.026	85	1.451	119	0.6113
								120	0.5972

02. Expected Communication Voltage

02.01. Outdoor CPU Board



NOTE

Voltage between DATA & COM/SCREEN should be 17VDC +/- 2VDC.

AC System		EC System				
Split	Package	Split	Package			
SCA300C / SCA300E	PCA300U/V	SCA260C / SCG260E	PCA260U/V	PCG153U/V	PCG330U/V	PCG290L/R
SCA330C / SCA330E	PCG330U/V	SCA290C / SCG290E	PCA290U/V	PCG173U/V	PCG340U/V	PCG300L/R
SCA340C / SCA340E	PCG340U/V	SCA330C / SCG330E	PCA400U/V	PCG203U/V	PCG400U/V	PCG330L/R
SCA400C / SCA400E (ZP72)		SCA340C / SCG340E		PCG233U/V		PCG340L/R
		SCA400C / SCG400E (ZP76)		PCG260U/V		PCG400L/R
				PCG290U/V		
		CRA300T / EVA300S				PKA300T-L/R

03. CPI PWM Range

Unit Model			Maximum	Nominal	Minimum
Split	Package				
SCA260C / SCG260E	PCG260U/V		99	78	55
SCA290C / SCG290E	PCG290U/V	PCG290L/R	94	61	51
		PCG300L/R	94	61	51
SCA330C / SCG330E	PCG330U/V	PCG330L/R	95	69	53
SCA340C / SCG340E	PCG340U/V	PCG340L/R	95	69	50
SCA400C / SCG400E (ZP76)	PCG400U/V	PCG400L/R	95	71	53

(CPI3-?) PWM Interface Board		Actron Part No. 2020-10?		
Unit Model	Jumper PIN Position	CPI3-? % PWM Range		
		Maximum	Nominal	Minimum
EVA300S	A			
CRA300T	B			
PKA300T-L/R	C			

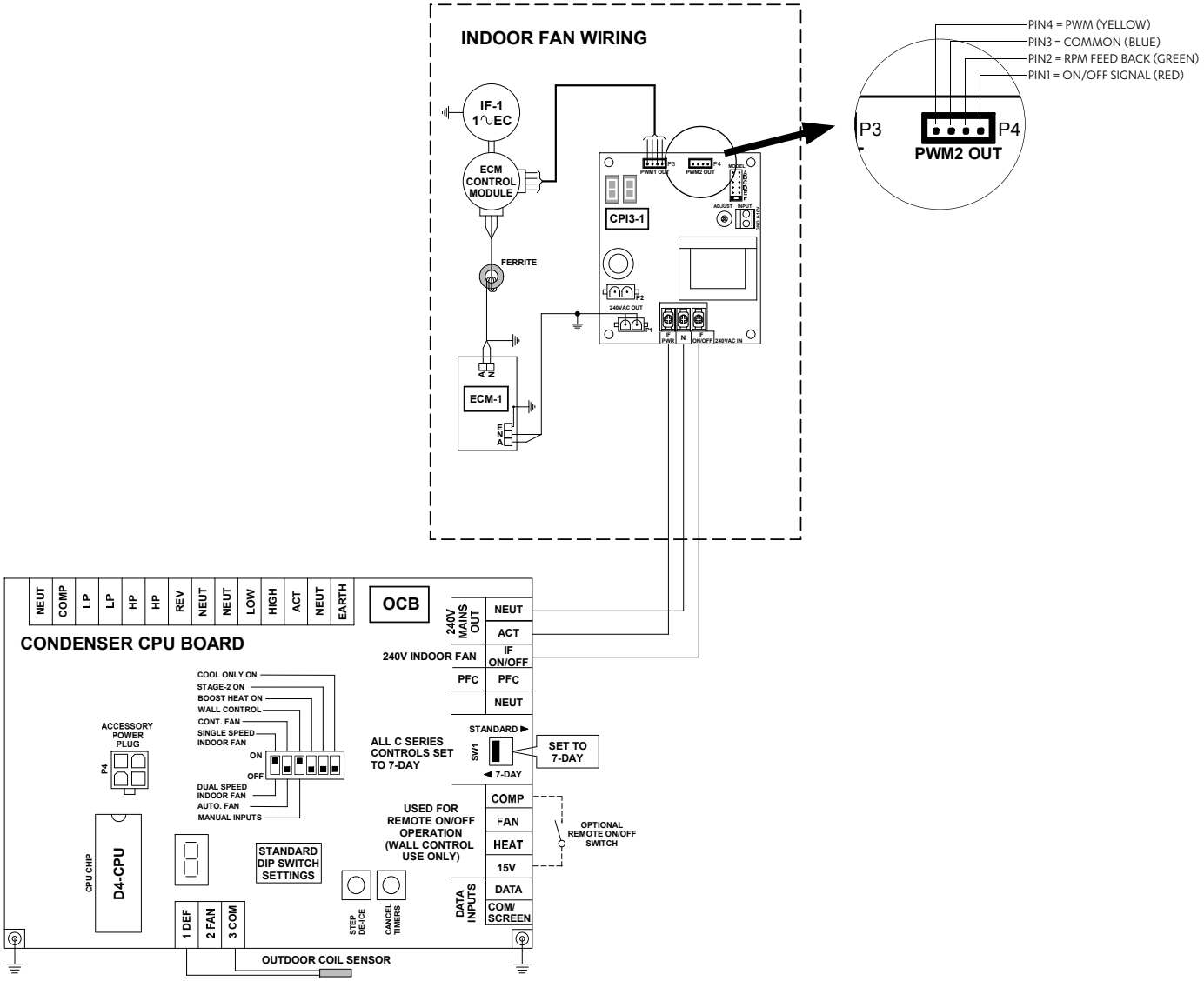
(CPI3-2) PWM Interface Board		Actron Part No. 2020-101		
Unit Model	Jumper PIN Position	CPI3-2 % PWM Range		
		Maximum	Nominal	Minimum
PCG153U/V	C	99	84	64
PCG173U/V	D	99	88	66
PCG203U/V	E	90	68	52
PCG233U/V	F	99	67	46

to be confirmed - as per lut's email

(CPI3-2) PWM Interface Board		Actron Part No. 2020-103		
Unit Model	Jumper PIN Position	CPI3-2 % PWM Range		
		Maximum	Nominal	Minimum
PCG153U/V	C	98	84	60
PCG173U/V	D	99	88	67
PCG203U/V	E	88	68	52
PCG233U/V	F	99	73	46

to be confirmed - as per darren's email

Outdoor CPU Board with EC Fan



Step 1

1. Measure the Indoor Fan on/off signal.

   On signal = 12 to 18V DC signal on Pin 1 and 3 (red and blue wires).

   Off signal= +0V DC signal on Pin 1 and 3.

2. Ensure 240V between IF ON/Off Terminal and Neutral.

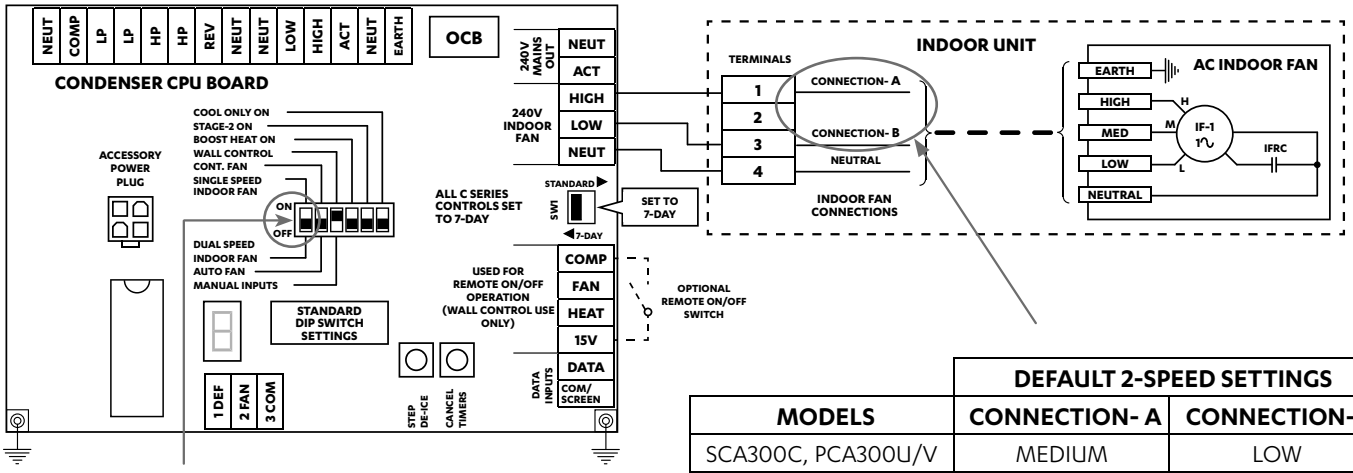
Step 2

1. Set the tester to measure duty cycle.
3. Measure the reading across PIN 3 and 4 (blue and yellow wires).
4. Change fan speed and check for any changes in readings.
5. Compare the duty cycle output to the expected PWM for each model.

NOTE

Duty cycle setting on multi meter required to complete step 2.

04. Outdoor Board with AC Fan



By default, the DIP switch is set on **DUAL SPEED INDOOR FAN**

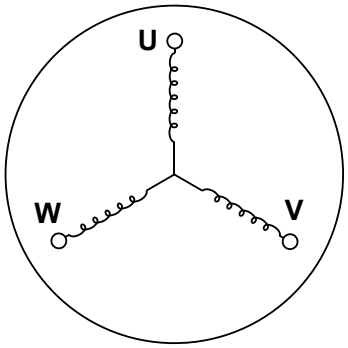
	DEFAULT 2-SPEED SETTINGS	
MODELS	**CONNECTION- A**	**CONNECTION- B**
SCA300C, PCA300U/V	MEDIUM	LOW
SCA330C, PCA330U/V	HIGH	MEDIUM
SCA340C, PCA340U/V	HIGH	MEDIUM

NOTE

Test AC 240V to indoor fan from HIGH and LOW terminals and then multi meter leads to the terminals.

05. Compressor Resistances

COMPRESSOR WINDINGS THREE PHASE



				RATING OF COMPRESSOR WINDINGS (OHMS)		
UNIT MODEL			**COMPRESSOR MODEL**	**U - V**	**V - W**	**U - W**
SCA260C	PCA260U/V PCG260U/V		ZP90KCE-TFD-522	1.59	1.59	1.59
SCA290C	PCA290U/V PCG290U/V	PCG290L/R	ZP103KCE-TFD-522	1.59	1.59	1.59
CRA300T SCA300C	PCA300U/V	PCG300L/R	ZP54KSE-TFM-522	3.199	3.199	3.199
SCA330C	PCA330U/V PCG330U/V	PCG330L/R	ZP120KCE-TFD-522	1.227	1.227	1.227
SCA340C	PCA340U/V PCG340U/V	PCG340L/R	ZP61KCE-TF0-522	2.69	2.69	2.69
SCA400C	PCA400U/V PCG400U/V	PCG400L/R	ZP76KCE-TFD-522	1.79	1.79	1.79

06. Fault and Status Codes

FAULT / FUNCTION CODES		
OUTDOOR CPU	**C7-4 WALL CONTROLLER (PART C7)**	**FUNCTION / FAULT**
0	-	Cooling Mode
1	-	Heating Mode - Normal
2	-	Heating Mode - Compressor run time > 20 mins
3	-	Heating Mode - Defrost
5	-	Heating Mode - Indoor Coil Pre-Heat
7	E7	Fault, Open Circuit Outdoor Coil Sensor
8	E7	Fault, Open Circuit Outdoor Coil Sensor
9	E9	Fault , High - Low Pressure
-	E5	Communication Error between outdoor and wall controller

NOTES:

1. When unit is powered up, the first No. shown on LED display will be the CPU version No., then 8 followed by normal controller status codes.
2. Faults may not be displayed on the wall controller until the fault occurs several times.
3. Phase error will be indicated by the indicator lights on the 3 phase sequence relay.
4. Phase correction must be applied to the incoming supply side.

STANDARD COMMERCIAL CYCLING ERRORS			
FAULT CODE	**DESCRIPTION**	**POSSIBLE CAUSES**	**REMEDIES**
E5 Communication Error between outdoor and wall controller	E5 will be displayed on all connected wall controllers until communication between indoor and outdoor has been restored.	Faulty wall controller.	Replace faulty cable/ board.
		Loose/poor cable connection to board terminals.	Check voltages or replace wall controller.
E7 Fault outdoor coil sensor	Outdoor fans will operate on high speed only (while unit is running).	Outdoor coil sensor is open or short circuit.	Replace outdoor coil sensor.
	Defrost will occur every 23 minutes when on heating.	Loose sensor wiring on outdoor PCB.	Check wiring.
	E7 will be displayed every time the system is switched on.		
E9 Fault Low Gas Pressure	Low Pressure Control will cut out the system (i.e. stop the compressor and fans) if a pressure less than 165kPa is detected. Compressor stops for 5 minutes for the 1st and 2nd trip. If the low pressure switch trips out three times in a row, then the unit will remain off for 15 minutes before attempting to re-start. For the system to restart after a Low Pressure cut out, the pressure switch needs to detect a pressure greater than 330kPa.	Insufficient airflow over indoor coil during cooling operation.	Check indoor fan operation to ensure sufficient airflow is flowing across the indoor coil.
		Under or overcharged with refrigerant.	Amend gas charge until charge is correct.
		Insufficient airflow over outdoor coil during heating operation.	Check for dirty outdoor coil & inspect outdoor fan operation.
		Blockage in refrigeration system.	Remove blockage from refrigeration system.
		Dirty filter.	Clean Filter.

THREE PHASE SOFT STARTER (3PS5) FAULT / STATUS CODES (OPTIONAL)	
OPERATION / FAULT MODE	**ON-BOARD LED INDICATION**
Random power up delay	1 blink per second for 10 seconds
Ready to start	LED - Off
Compressor running	LED remains Off
Anti-cycle protection delay after the compressor cycles off	1 blink per second for 50 seconds, then LED Off, ready to start
Phase L1 Missing	No lights, no operation
Compressor Failed to Start	2 blinks (in bursts), for 4 minutes
Phase Rotation, Missing or Low	3 blinks (in bursts), compressor won't try to start
Compressor Winding Open	4 blinks for 50 secs, then tries to start again
Compressor Windings Swapped	LED Off, compressor operation will be noisier than usual

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