COMMERCIAL
REFRIGERATION

PAC²

Packaged Condensing Unit

60Hz

Tecumseh

Built for Today. Ready for Tomorrow.

Cooling for a Better Tomorrow

PAC²

RELIABILITY & ROBUSTNESS

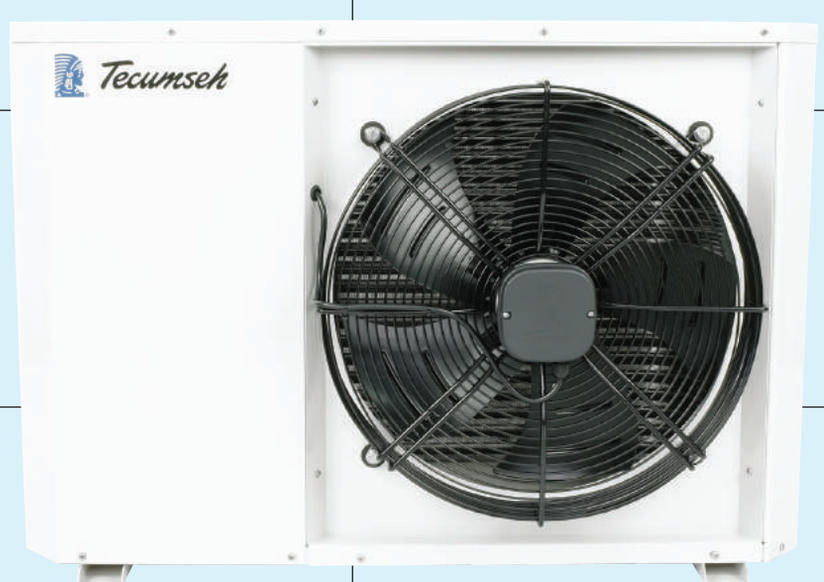
Throughout it's history, Tecumseh Products Company has been a leader in providing customers with efficient and reliable products for commercial refrigeration and air conditioning applications. The New Packaged Condensing Unit is built upon Tecumseh's platform of proven technology. With a design that is both sturdy and robust, the new PAC units endure vigorous testing to ensure long life in the field. Following the success of it's predecessor, the new PAC will be equipped with high quality components, with a housing resistant to corrosion and rust.

FEATURES & BENEFITS

Compactness
Housing is redesigned to optimize spacing & functionality. New housing now only at a length of 913mm.

Powder Coated Steel Parts
To prevent rust, better outlook.

Consistent Product Quality
Relying on Tecumseh manufacturing capabilities.



Factory Leak Tested
Ensure that there is no leakage in the field.

Prompt Delivery
Short lead time, quick assembly.

Strong Aftersale Services
Back up by Tecumseh's experienced sales and technical support team.

WHAT IS NEW?

i) More compact.

ii) Lighter in weight.

iii) Easy service ability as the mechanical and electrical are in the same compartment.

iv) Optional accessories.

TABLE OF CONTENTS

PAC² NOMENCLATURE

PAC 4 5 46 Z -V2

Family
S = Single Phase
No letter = Three Phase

Application
2 = Low Back Pressure
4 = High Back Pressure

Capacity
Number of digits
of cooling capacity.

Refrigerant
E = R-404A, R-507
T/F = R-22
Y = R-134a

Capacity
First two digits in
Rating Point Capacity
@60Hz (46,000 Btu/h)

STANDARD ACCESSORIES

Rotalock Valve

Fan Motor

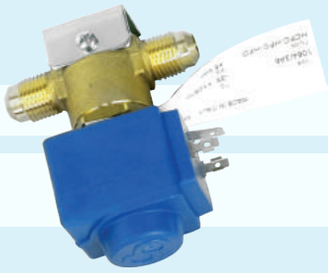
Liquid Receiver

High Low
Pressure Switch

Filter Drier

Sight Glass

OPTIONAL ACCESSORIES



Solenoid Valve

Oil Separator

Suction Accumulator

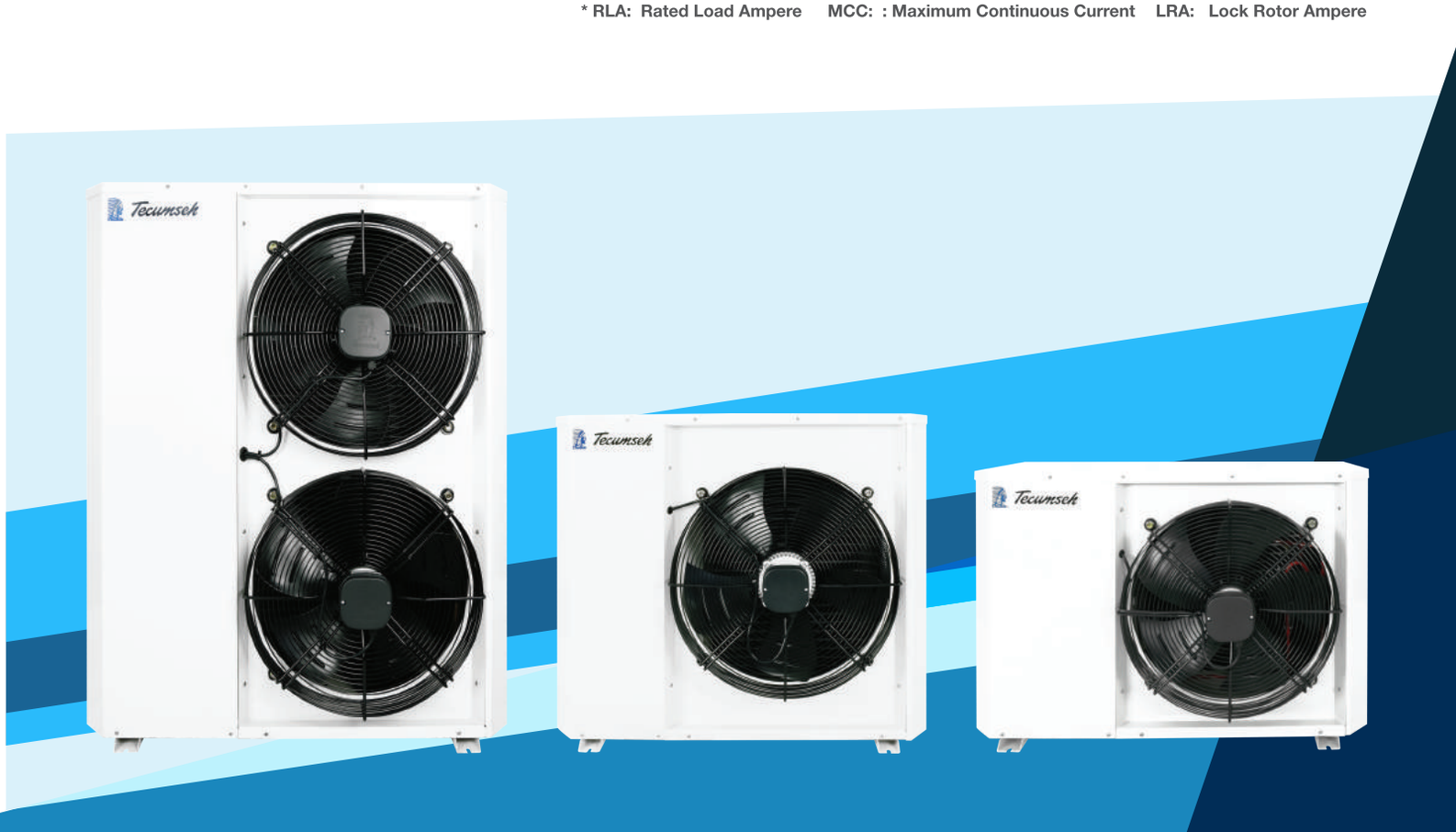
PERFORMANCE DATA

60 Hz Range

	Models	Compressor Model	HP	Capacity (W) at EN13215, Ambient Temperature 32 °C, Return Gas Temperature 20 °C, Subcooling 3 K					Power Input (W) @ evap. temp. -25 °C	COP (W/W)	Current (A)		
				-40	-35	-30	-25	-20			RLA [A]	MCC [A]	LRA [A]
LBP R-404A	PACS2480Z PAC2480Z	FH2480Z TFH2480Z	2.0	930	1384	1846	2318	2798	2018	1.15	10.1	21.9	92.9
											6.3	11.7	40.9
	PACS2511Z PAC2511Z	FH2511Z TFH2511Z	2.8	1078	1718	2362	3009	3657	2591	1.16	12.9	27.9	102.9
											8.0	14.3	49.9
	PAC2513Z	TAG2513Z	3.3	1332	2172	3112	4152	5290	3354	1.24	9.2	20.2	86.9
	PAC2516Z	TAG2516Z	4.0	1808	2633	3112	4484	5507	3835	1.17	11.4	29.0	87.4
	PAC2522Z	TAG2522Z	5.5	2382	3378	4448	5590	6801	4725	1.18	14.3	32.3	119.4
	PAC2525Z	TAG2525Z	6.3	2952	4101	5366	6723	8139	5153	1.30	15.1	29.0	119.4

	Models	Compressor Model	HP	Capacity (W) at EN13215, Ambient Temperature 32 °C, Return Gas Temperature 20 °C, Subcooling 3 K					Power Input (W) @ evap. temp. -5 °C	COP (W/W)	Current (A)		
				-15	-10	-5	0	5			RLA [A]	MCC [A]	LRA [A]
HBP R-404A	PACS4517Z PAC4517Z	CAJ4517Z TAJ4517Z	1.4	2305	2716	3160	3619	4075	2025	2.01	10.1	15.8	51.9
											6.7	9.8	35.9
	PACS4519Z PAC4519Z	CAJ4519Z TAJ4519Z	1.6	2632	3151	3685	4234	4797	2652	1.81	13.2	17.9	60.9
											9.2	12.0	46.9
	PACS4524Z PAC4524Z	FH4524Z TFH4524Z	2.0	2993	3637	4290	4951	5616	3002	1.87	15.4	23.9	71.9
											9.9	13.9	45.9
	PACS4531Z PAC4531Z	FH4531Z TFH4531Z	2.6	4245	5191	6145	7104	8065	4029	2.00	19.3	32.3	94.9
											12.0	16.2	55.9
	PACS4540Z PAC4540Z	FH4540Z TFH4540Z	3.3	5118	6164	7233	8321	9424	5154	1.83	26.3	42.0	110.4
											16.8	24.2	89.4
	PAC4546Z	TAG4546Z	3.8	5892	7349	8885	10495	12170	5450	2.23	17.8	24.0	100.4
	PAC4553Z	TAG4553Z	4.4	6278	7814	9412	11065	12767	6132	2.08	19.5	29.3	107.4
	PAC4561Z	TAG4561Z	5.0	7181	9001	10900	12873	14913	7058	2.11	22.3	33.1	126.8
	PAC4568Z	TAG4568Z	5.7	8173	10445	12673	14852	16975	8006	2.12	25.0	38.3	143.8
	PAC4573Z	TAG4573Z	6.0	8927	10897	12948	15072	17262	8880	1.94	28.4	41.0	138.8
	PAC4581Z	TAG4581Z	6.8	10482	12574	14696	16774	18715	10401	1.80	32.8	43.8	195.8

* RLA: Rated Load Ampere MCC: : Maximum Continuous Current LRA: Lock Rotor Ampere



TECHNICAL SPECIFICATION

	Models	Compressor Model	HP	Oil Type	Fan		Liquid Receiver	Diameter of Connection [mm]		Dimension			Weight [kg]
					Size	Input		Suction	Liquid	L [mm]	W [mm]	H [mm]	
LBP R-404A	PACS2480Z PAC2480Z	FH2480Z TFH2480Z	2.0	POE	1 x 450 mm	150 W	3.9 L	15.9 (5/8")	9.5 (3/8")	913	416	638	78
	PACS2511Z PAC2511Z	FH2511Z TFH2511Z	2.8										78
	PAC2513Z	TAG2513Z	3.3										89
	PAC2516Z	TAG2516Z	4.0		1 x 500 mm	230 W		22.2 (7/8")	12.7 (1/2")			800	97
	PAC2522Z	TAG2522Z	5.5										99
	PAC2525Z	TAG2525Z	6.3										99

	Packaging Models	Compressor Model	HP	Oil Type	Fan		Liquid Receiver	Diameter of Connection [mm]		Dimension			Weight [kg]
					Size	Input		Suction	Liquid	L [mm]	W [mm]	H [mm]	
HBP R-404A	PACS4517Z PAC4517Z	CAJ4517Z TAJ4517Z	1.4	POE	1 x 450 mm	150 W	3.9 L	15.9 (5/8")	9.5 (3/8")	913	416	638	63
	PACS4519Z PAC4519Z	CAJ4519Z TAJ4519Z	1.6										63
	PACS4524Z PAC4524Z	FH4524Z TFH4524Z	2.0										80
	PACS4531Z PAC4531Z	FH4531Z TFH4531Z	2.6										81
	PACS4540Z PAC4540Z	FH4540Z TFH4540Z	3.3		1 x 500 mm	230 W		22.2 (7/8")	12.7 (1/2")			800	89
	PAC4546Z	TAG4546Z	3.8										96
	PAC4553Z	TAG4553Z	4.4										98
	PAC4561Z	TAG4561Z	5.0		2 x 450 mm	2 x 150 W	9.5L	22.2 (7/8")	12.7 (1/2")			1149	125
	PAC4568Z	TAG4568Z	5.7										126
	PAC4573Z	TAG4573Z	6.0										127
	PAC4581Z	TAG4581Z	6.8										127

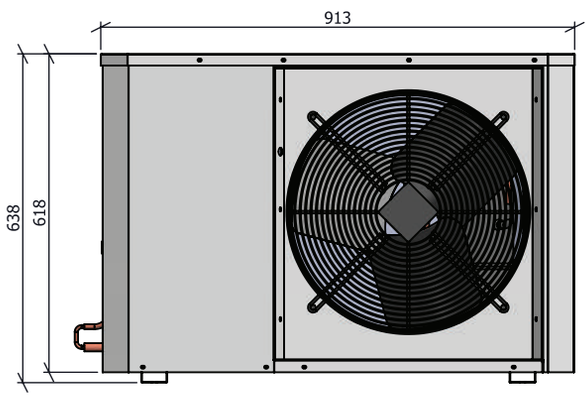
PACKAGED UNIT REPLACEMENT PARTS

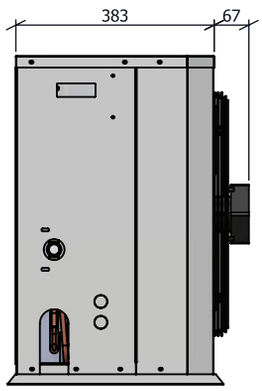
	Models	Compressor Model	Compressor BoM FZ/TZ	Compressor BoM HZ/KZ	Receiver	Fan Motor	High/Low Pressure Switch	Filter Drier	Sight Glass	PCLV
LBP R-404A	PACS2480Z PAC2480Z	FH2480Z TFH2480Z	2527030128	2527000128	7380165	7552510	7580028	7348084	7380305	7348101
			2567030126	2567090126						
	PACS2511Z PAC2511Z	FH2511Z TFH2511Z	2527230128	2527200128						
			2567230126	2567290126						
	PAC2513Z	TAG2513Z	2835330102	2835392102						
	PAC2516Z	TAG2516Z	2835030102	2835192102		7552515		7348086	7380306	7348102
	PAC2522Z	TAG2522Z	2835230102	2835292102						
	PAC2525Z	TAG2525Z	2835530102	2835592102						

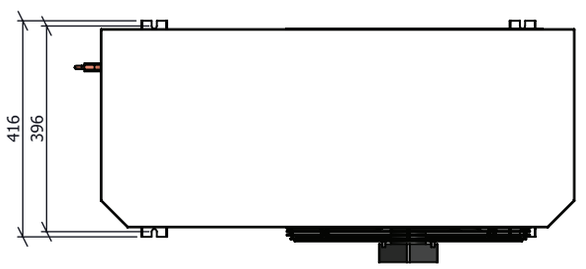
	Packaging Models	Compressor Model	Compressor BoM FZ/TZ	Compressor BoM HZ/KZ	Receiver	Fan Motor	High/Low Pressure Switch	Filter Drier	Sight Glass	PCLV
LBP R-404A	PACS4517Z PAC4517Z	CAJ4517Z TAJ4517Z	AJ4ZL1JF707A06	AJ4ZL1JF707A06	7380165	7552510	7580028	7348084	7380305	7348101
			AJ4ZL1TF707A10	AJ4ZL1TF707A10						
	PACS4519Z PAC4519Z	CAJ4519Z TAJ4519Z	AJ4ZR1JF707A06	AJ4ZR1JF707A06						
			AJ4ZR1TF707A10	AJ4ZR1TF707A10						
	PACS4524Z PAC4524Z	FH4524Z TFH4524Z	2525230128	2525230128						
			2565230126	2565230126						
	PACS4531Z PAC4531Z	FH4531Z TFH4531Z	2525430128	2525430128						
			2565230126	2565230126						
	PACS4540Z PAC4540Z	FH4540Z TFH4540Z	2525630128	2525630128		7552515		7348086	7380306	7348102
			2565630126	2565630126						
	PAC4546Z	TAG4546Z	2835630102	2835630102						
	PAC4553Z	TAG4553Z	2835830102	2835830102						
	PAC4561Z	TAG4561Z	2836030102	2836030102	7380157	7552510				
	PAC4568Z	TAG4568Z	2836130102	2836130102						
	PAC4573Z	TAG4573Z	2836230102	2836230102						
	PAC4581Z	TAG4581Z	2836330102	2836330102						

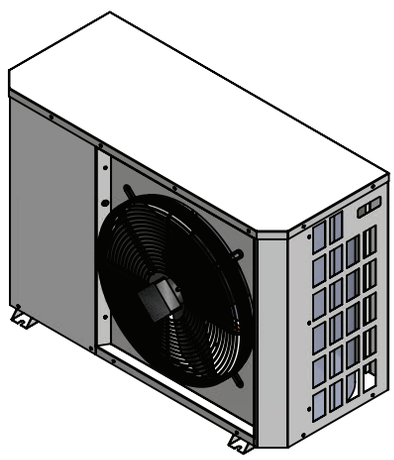
DIMENSIONAL DRAWINGS

PAC² Small

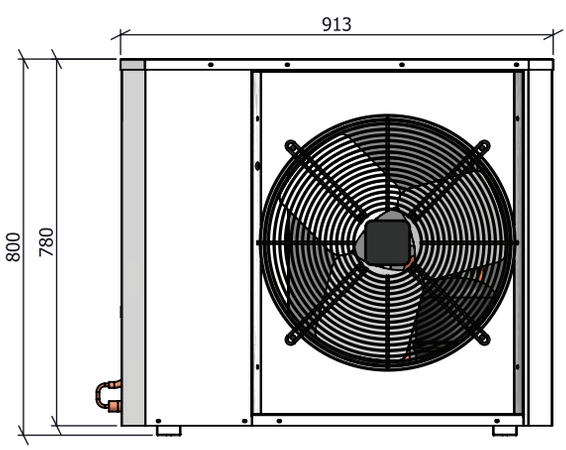


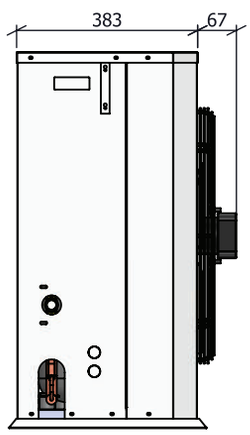


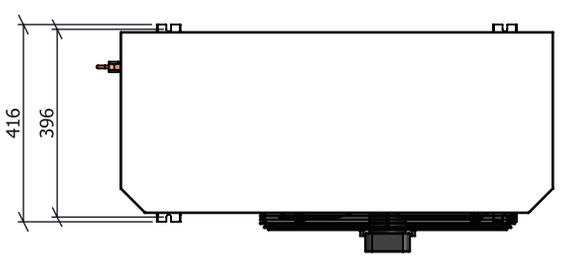


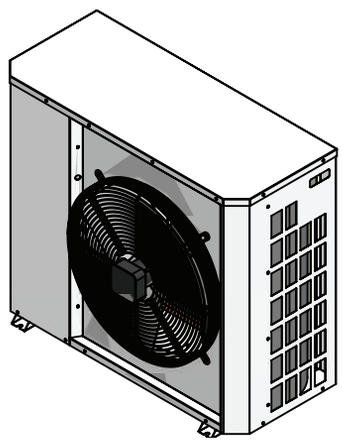


PAC² Medium



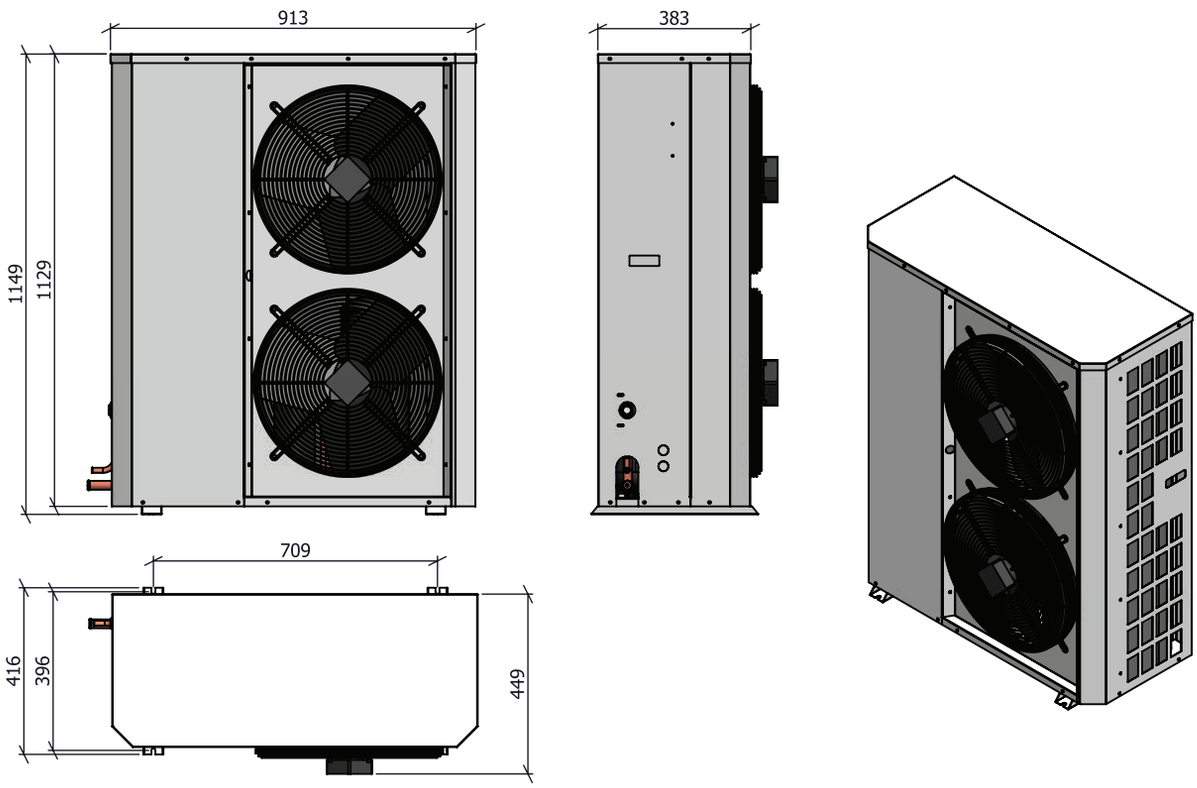






DIMENSIONAL DRAWINGS

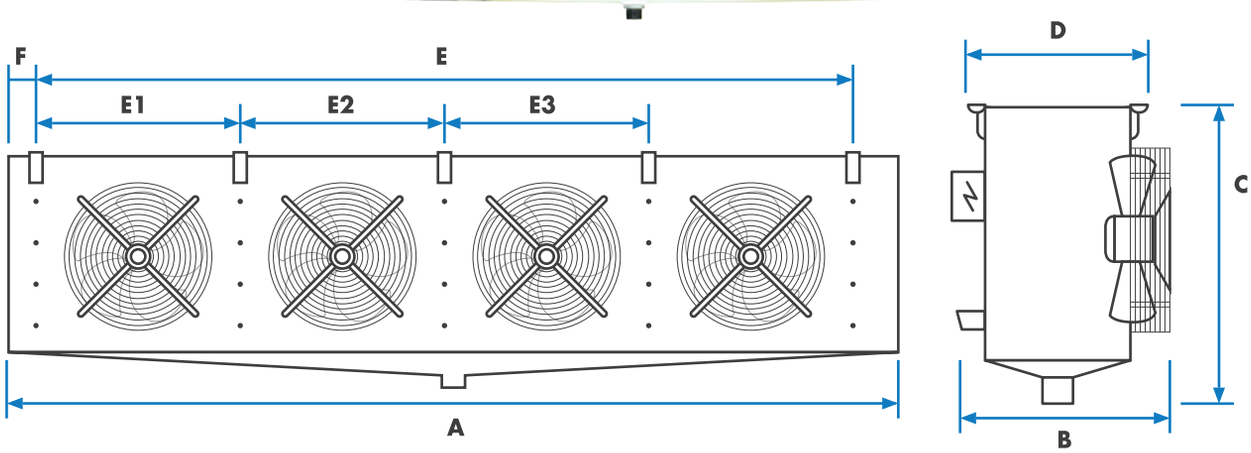
PAC² Large



PACKAGED UNIT PACKAGING

Unit Packaging	Dimension (mm)		
	Length	Width	Height
PAC² Small	1135	716	935
PAC² Medium	1135	716	935
PAC² Large	1050	552	1465

PAIR UP WITH OUR UNIT COOLERS



Model	A	B	C	D	E	E1	E2	E2	F1	Defrost Meter		
										Inlet	Outlet	Drainage
TEM-H-3.0/15	1000	440	490	325	780	-	-	-	80	1/2	3/4	3/4
TEM-L-2.2/12												
TEM-H-4.1/20	1130				910						7/8	
TEM-H-4.9/20	1115	390	525	345	800				158			
TEM-H-3.0/15												
TEM-H-8.0/40	1330	470	630	365	1060				95	5/8	1”1/8	
TEM-L-5.6/30												
TEM-H-11.2/55	1600				1330							
TEM-L-7.5/40												
TEM-H-16.2/80	1920	635	730	435	1650	800					1”1/4	1”
TEM-L-11.2/60												
TEM-H-21.3/105												
TEM-L-14.9/80												
TEM-H-25.0/125	2720				2450		800			3/4	1”1/2	
TEM-L-18.7/100												
TEM-H-32.6/160												
TEM-L-22.4/120												
TEM-H-37.6/185	3520				3250			800			1”7/8	1”1/2
TEM-L-26.2/140												
TEM-H-42.7/210												
TEM-L-30.0/160												
TEM-L-30.0/160		725	830	525						7/8		

PAC² AND UNIT COOLER PACKAGE (Optional)

PAC² Model	Unit Cooler
High Back Pressure Models	
PAC/S4517Z-V2	TEM-H-3.0/15
PAC/S4519Z-V2	TEM-H-4.1/20
PAC/S4524Z-V2	TEM-H-4.1/20
PAC/S4531Z-V2	TEM-H-4.9/20
PAC/S4540Z-V2	TEM-H-8.0/40
PAC4546Z-V2	TEM-H-8.0/40
PAC4553Z-V2	TEM-H-8.0/40
PAC4561Z-V2	TEM-H-11.2/55
PAC4568Z-V2	TEM-H-11.2/55
PAC4573Z-V2	TEM-H-11.2/55
PAC4581Z-V2	TEM-H-11.2/55

PAC² Model	Unit Cooler
Low Back Pressure Models	
PAC/S2480Z-V2	TEM-L-2.2/12
PAC/S2511Z-V2	TEM-L-3.0/15
PAC2516Z-V2	TEM-L-5.6/30
PAC2522Z-V2	TEM-L-5.6/30
PAC2525Z-V2	TEM-L-5.6/30

Disclaimer: The recommended models above are based on the specific condition:
HBP: Room temperature of 0 deg C, delta T of 7K.
LBP: Room temperature of -18 deg C, delta T of 7K.

TECHNICAL SPECIFICATION

	Models	Nominal Capacity		Fan Motor					Defrost Heater			Weight [kg]
		W	Btu/hr	Nos	Dia Φ (mm)	Air Volume (m³/hr)	Motor Power (w)	Volt (v)	Coil (kW)	Drain Pan (kW)	Volt (v)	
LBP R-404A	TEM-L-2.2/12	2813	9599	2	Φ 300	2 x 1650	2 x 75	220	1.50	0.82	220	27
	TEM-L-3.0/15	3836	13090	2	Φ 300	2 x 1650	2 x 75	220	2.94	1.06	220	45
	TEM-L-5.6/30	7161	24434	2	Φ 400	2 x 3400	2 x 180	220	2.10	1.11	220	65
	TEM-L-7.5/40	9591	32724	2	Φ 400	2 x 3400	2 x 180	220	2.58	1.35	220	73
	TEM-L-11.2/60	14322	48868	2	Φ 500	2 x 6300	2 x 550	380	6.20	1.72	220	115
	TEM-L-14.9/80	19054	65011	2	Φ 500	2 x 6300	2 x 550	380	6.20	1.72	220	125
	TEM-L-18.7/100	23913	81591	3	Φ 500	3 x 6300	3 x 550	380	9.08	2.44	220	170
	TEM-L-22.4/120	28645	97735	3	Φ 500	3 x 6300	3 x 550	380	9.08	2.44	220	180
	TEM-L-26.2/140	33504	114315	4	Φ 500	4 x 6300	4 x 550	380	11.96	3.02	220	210
	TEM-L-30.0/160	38363	130895	4	Φ 500	4 x 6300	4 x 550	380	11.96	3.02	220	240

	Models	Nominal Capacity		Fan Motor					Defrost Heater			Weight [kg]
		W	Btu/hr	Nos	Dia Φ (mm)	Air Volume (m³/hr)	Motor Power (w)	Volt (v)	Coil (kW)	Drain Pan (kW)	Volt (v)	
HBP R-404A	TEM-H-3.0/15	3409	11632	2	Φ 300	2 x 1650	2 x 75	220	1.50	0.82	220	30
	TEM-H-4.1/20	4659	15899	2	Φ 300	2 x 1650	2 x 75	220	1.80	0.94	220	37
	TEM-H-4.9/20	5568	18999	2	Φ 300	2 x 1650	2 x 75	220	1.96	1.06	220	49
	TEM-H-8.0/40	9091	31018	2	Φ 400	2 x 3400	2 x 180	220	2.10	1.11	220	68
	TEM-H-11.2/55	12727	43452	2	Φ 400	2 x 3400	2 x 180	220	2.58	1.35	220	77
	TEM-H-16.2/80	18409	62812	2	Φ 500	2 x 6300	2 x 550	380	4.65	1.72	220	120
	TEM-H-21.3/105	24205	82586	2	Φ 500	2 x 6300	2 x 550	380	4.65	1.72	220	132
	TEM-H-25.0/125	28409	96932	3	Φ 500	3 x 6300	3 x 550	380	6.81	2.44	220	182
	TEM-H-32.6/160	37045	126399	3	Φ 500	3 x 6300	3 x 550	380	6.81	2.44	220	193
	TEM-H-37.6/185	42727	145785	4	Φ 500	4 x 6300	4 x 550	380	8.97	3.02	220	230
	TEM-H-42.7/210	48523	165560	4	Φ 500	4 x 6300	4 x 550	380	8.97	3.02	220	260
	TEM-H-57.4/280	65227	222555	4	Φ 500	4 x 6300	4 x 550	380	12.04	3.02	220	290

Nominal capacity rated at room temperature of 0 deg C, Delta T of 8K

UNIT COOLER

1. Advice

1.1 Transport

For information regarding the supply of these units, please refer to your terms and conditions.

Before use, please make sure that the unit is in good condition and has not been damaged externally.

1.2 Installation

- This condensing unit and relating equipment must be installed by qualified staff.
- The installation of the condensing unit is subjected to the norms and technical standards for refrigeration and electrical connection in the respective country.
- Tecumseh Europe Malaysia declines all responsibility if installation and maintenance are not carried out according to these instructions.
- The application limits for low back and high back pressure condensing units as defined by Tecumseh Europe Malaysia must be respected.

2. Installation

Attention: Do not handle the condensing unit by the tubes, but by the bracket provided.

2.1 Location

- The condensing unit should not block or obstruct thoroughfares, persons, doors or shutters.
- The surface (wall or ground) supporting the condensing unit must be capable of bearing its weight.
- Ensure that the condensing unit is installed in a level position.
- Keep enough distance between the compressor and any objects in its surroundings in order to ensure good air circulation.
- Do not expose the condensing unit to heat or humidity. Do not use it over the maximum operating pressure.
- Avoid corrosive or dusty environments.

UNIT COOLER

2.2 Refrigeration connections

- In order to always ensure best quality of our products, the compressor is supplied dry and filled with nitrogen. The valves are closed.
- To maintain the quality of a Tecumseh Euro Malaysia condensing unit and to ensure its smooth operation it is recommended to:

1. *Verify that the refrigerant circuit is clean and dry. Put a dryer in the liquid line in accordance with the refrigerant charge.*
2. *Braze under nitrogen and protect electrical equipment from heating.*
3. *Insulate the suction line up to the compressor inlet to avoid condensation.*
4. *Use only refrigerants the compressor has been designed for (refer label).*
5. *Refrain from adding any additives or additional colorants.*
6. *Refrain from adding oil unless the piping exceeds 20 m. In this case use the oil recommended by Tecumseh Euro Malaysia.*
7. *Direct pressure relief devices in order to not put the user at risk.*
8. *Cut and bend the tubes carefully to avoid dust and metal particles entering the system.*
9. *Never use a saw and employ bending tools appropriate to the diameter of the tube to avoid restrictions. Tecumseh Euro Malaysia recommend using brazed connections instead of screws connections such as flared joints to avoid leakages in the long run. Screwed connections with a seal on flat surfaces are acceptable.*

2.3 Electrical connections

- To maintain the quality of a Tecumseh Euro Malaysia condensing unit, to ensure the safety of the installation and its smooth operation, it is necessary to:

1. *Never wire the condensing unit under voltage.*
2. *Verify that the voltage of the power supply of the installation is compatible with the one of the condensing unit (refer label).*
3. *Size the wiring for the connection (capacity, power) according to the characteristics of the installed compressor (refer label).*
4. *Protect and earth the electrical power supply.*
5. *Carry out electrical connections according to the norms of the respective country.*
6. *Use the motor protection and the relay supplied with the compressor, even if another model might seem to be suitable at a given time.*
7. *Tecumseh Euro Malaysia compressors are always protected by an external or internal protection device based on a temperature/current combination. As with every protection device, it cuts off the power supply when the compressor functions outside its normal application ranges given by Tecumseh Euro Malaysia.*

Voltage Codes	1~	3~	Application Range
XA	100 V, 50 Hz 115 V, 60 Hz	-	90 - 110 V 103 - 127 V
FZ	220 - 240 V 50 Hz	-	198 - 264 V
HZ	208 - 220 V 60 Hz	-	180 - 242 V
KZ	-	220 V, 50 Hz 220 V, 60 Hz	180 - 253 V 187 - 264 V
TZ	-	400 V, 50 Hz 440 V, 60 Hz	340 - 440 V 396 - 499 V

INSTALLATION INSTRUCTION

3. Operation

3.1 Integrity of the circuit

All connections must be systematically checked for leaks with leak detector.

3.2 Evacuation

- Evacuate the system to about 200 micrometer Hg to ensure a good quality of the vacuum.
- It is recommended to evacuate simultaneously on both sides (HP and LP) to accelerate the operation and obtain an identical vacuum in the entire circuit.

3.3 Refrigerant charge

- Charge the system with refrigerant the compressor has been designed for (refer label).
- In case it is a blend, the refrigerant is always charged in the liquid phase to avoid changes of the composition.
- Never start the compressor under vacuum.
- Charge the refrigeration circuit until the nominal operating conditions of the installation are reached.

3.4 Verification before start

- Never leave the filling cylinder connected to the installation even if the valves are closed.
- Compatibility of the power supply voltage with those of the compressor and the fan condenser.
- Full opening of the service valves.
- Good rotation of the condenser fan.

3.5 Verification after start

After some operating hours verify the following:

1. Voltage and power requirement of the unit.
2. Pressures (HP and LP) of the unit.
3. Superheat.
4. Leak detection.
5. General condition of the installation.

Carry out a general inspection of the installation (cleanliness, unusual noises…). Not enough refrigerant charge:

1. LP and HP.
2. Frozen evaporator.
3. Low subcooling.
4. Bubbles in the sight glass.

Too much refrigerant charge:

1. High pressure.
2. High current.
3. High compressor temperature.

INSTALLATION INSTRUCTION

4. Service and Maintenance

Never work on a condensing unit without protection or precautions.

- The compressor in operation can reach temperatures above 120 °C.
  Protect yourself against the heat.

- Power supply of the compressor.
  Isolate the compressor from its power supply.

- Power supply of the pressure switch.
  Isolate the pressure switch from its power supply.

- Verify that the pressure of the refrigeration circuit does not put persons at risk when working on the unit (spattering of components, refrigerants…).
  Isolate the pressure switch from its power supply.

Use appropriate equipment to empty or recharge the refrigeration unit (recovery system, eye protection, gloves…)

Carry out leak check once a year or according to national regulations.

Verify regularly:

1. The safety and control devices.
2. The state of the electrical and refrigeration connections (security, oxidation).
3. The operating conditions.
4. The installation of the condensing unit on its support.
5. The working of the crankcase heater or the heating band (if any).
6. The cleanliness of the heat exchanges.

5. Safety

Our compressors are designed to work at a maximum ambient temperature of + 46 °C. Never exceed this temperature.

To optimise the refrigerant quantity in the installation respect the technical standard.

Never exceed the maximum operating pressure of the compressor (refer label).

Avoid corrosive or dusty environments.

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