InRow® Direct Expansion

Close-coupled, air, water, and glycol cooling for closets, server rooms, and data centers

Up to 37kW

InRow SC, 300mm

InRow RD, 300mm

InRow RD, 600mm

InRow RP, 600mm

Row-Based Cooling

The InRow Direct Expansion product design closely couples the cooling with the IT heat load. This design prevents hot air recirculation, while improving cooling predictability and allowing for a pay as you grow environment. IT operators looking to improve efficiency or deploy higher density equipment will benefit from the modular design of the InRow Direct Expansion products. The intelligent controls of the InRow Direct Expansion products actively adjust fan speed and refrigerant flow to match the IT heat load to maximize efficiency and address the dynamic demands of today's IT environments.

To meet the diverse requirements of IT environments, the InRow Direct Expansion products are available in a wide range of sizes and heat rejection methods. The InRow SC is a self-contained unit in a 300 mm wide cabinet. The InRow RD air cooled models are available in 300 and 600 mm wide cabinets, and fluid cooled configurations in a 300 mm wide cabinet. The InRow RP is air cooled only and includes humidifiers and reheat for humidity control.

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Features/Benefits

Availability

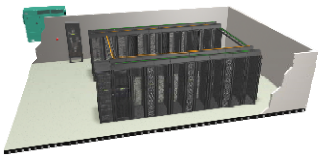
> Active Response Controls monitor and actively adjust cooling capacity to ensure proper server inlet temperatures.
> Variable Speed Compressors or Hot Gas Bypass allows for low load handling capabilities
> Placing the unit in the row of racks moves the source of cooling closer to the heat load. This eliminates air mixing and provides a predictable cooling architecture.

Total Cost of Ownership

>Close Coupled Cooling improves operational efficiency 30%-50% over traditional data center cooling approaches.
> Variable speed fans reduce energy consumption during off-peak cooling periods and adapt to unpredictable power densities.

Flexibility

>Adapts to work in both new and existing data center environments.
>Multiple Heat Rejection Methods – Flexibility to deploy in a variety of configurations including air and fluid based designs.

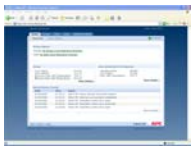


Serviceability

> Modular Components simplify replacement and reduce mean time to repair
>Allows system to remain operational if a fan replacement is required (300mm only).
> Row based equipment allows for all serviceable components to be replaced/maintained in the hot or cold aisles.
> Retractable electronics module for easy service (RD 300mm only)
> Easy to maintain, cleanable, deep loading mesh filter removes particles from the return air stream.

Manageability

> Real time display of current and available cooling.
> InfrastruXure Central compatible
> Microprocessor controller – 4 line, eighty character, alphanumeric display
> Building management system integration



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InRow® SC

Air cooled, self-contained row-based cooling for closets and server rooms.

Up to 7kW

1. PowerView for real time capacity monitoring and easy operation. User interface is network manageable.
2. High Head Pressure Protection – modulates fans to prevent unit from shutting down when condenser airflow is restricted or very high temperature.
3. Coil Freeze Protection – hot gas bypass prevents evaporator coil from freezing during light load conditions.
4. Remote probe guarantees inlet temperature to IT equipment.
5. Variable speed, hot-swappable fans reduce energy consumption during off-peak hours and allow system to remain operational if a replacement is required.
6. Condensate management – factory installed pump removes water from the unit, ensuring continuous operation.
7. Castors allow for easy movement

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Performance Specifications

Net Cooling Capacity			
Return Air Temperature	**SKU**	**Total Capacity kW (BTU/hr)**	**Sensible Capacity kW (BTU/hr)**
70ºF DB, 58.5ºF WB (21.1ºC DB, 14.7ºC WB)	ACSC100	4.77 (16300)	4.44 (15100)
	ACSC101	4.41 (15100)	4.20 (14300)
72ºF DB, 60.0ºF WB (22.2ºC DB, 15.6ºC WB)	ACSC100	4.98 (17000)	4.53 (15500)
	ACSC101	4.51 (15400)	4.23 (14400)
75ºF DB, 61.0ºF WB (23.9ºC DB, 16.1ºC WB)	ACSC100	4.89 (16700)	4.74 (16200)
	ACSC101	4.74 (162040)	4.65 (15900)
80ºF DB, 67.0ºF WB (26.7ºC DB, 19.4ºC WB)	ACSC100	5.31 (18100)	4.56 (15500)
	ACSC101	5.25 (18000)	4.68 (16000)
80ºF DB, 67.0ºF WB (26.7ºC DB, 19.4ºC WB)	ACSC100	5.04 (17200)	5.04 (17200)
	ACSC101	4.89 (16700)	4.89 (16700)
85ºF DB, 65.0ºF WB (29.4ºC DB, 18.3ºC WB)[1]	ACSC100	5.25 (18000)	5.25 (18000)
	ACSC101	4.89 (16700)	4.89 (16700)
95ºF DB, 82.7ºF WB (35.0ºC DB, 28.2ºC WB)[2]	ACSC100	6.45 (22000)	3.30 (11300)
	ACSC101	6.24 (21300)	3.30 (11300)
96ºF DB, 68.0ºF WB (35.5ºC DB, 20.0ºC WB)[3]	ACSC100	6.50 (22200)	6.50 (22200)
	ACSC101	5.80 (19800)	5.80 (19800)

Note: All values are accurate to +/- 5% and based on full fan speed with standard filters and 95F (35C) Condenser entering air.
All tests were performed at 100% evaporator fan speed except as noted. Net cooling data is published above.
1 Airflow reduced to 1000 CFM (1700 m3/hr) at this condition to maintain appropriate suction temperature.
2 Airflow reduced to 600 CFM (1020 m3/hr) at this condition to maintain appropriate suction temperature.
3 Airflow reduced to 850 CFM (1440 m3/hr) to maintain appropriate suction temperature. Represents conditions with front and rear containment.
Note: Minimum recommended heat load is 3kW per SC unit, depending on room conditions.

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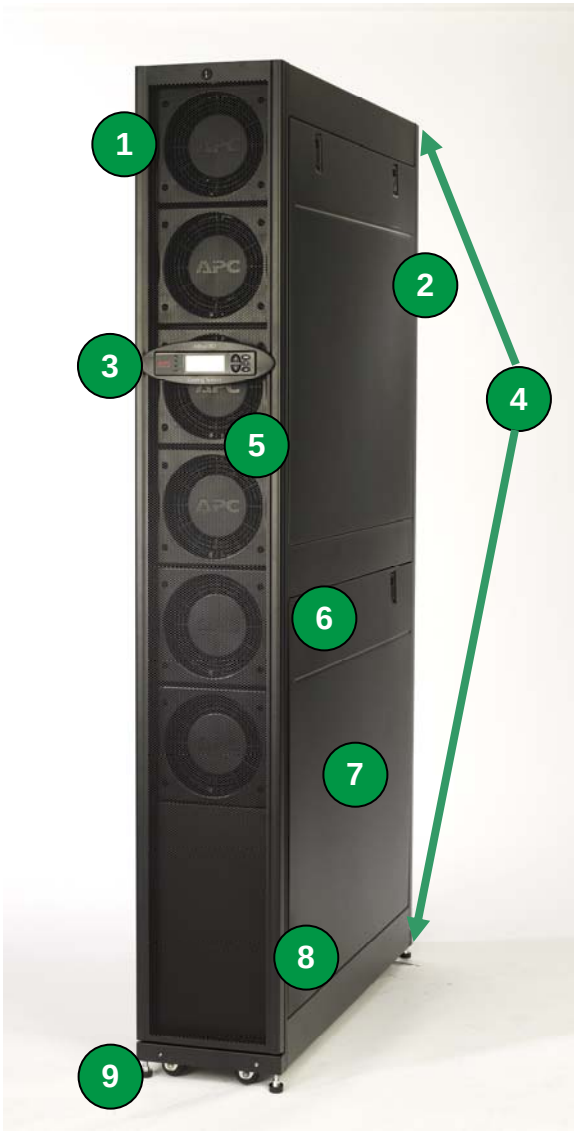
InRow® RD 300mm

Air, water, and glycol cooled row-based cooling for closets, server rooms, and data centers.

Up to10kW



1. Variable speed, hot-swappable fans reduce energy consumption during off-peak hours and allow system to remain operational if a replacement is required.
2. Rear retractable electronics module allows for easy service access.
3. Intelligent control offer network manageability, real time capacity monitoring, predictive failure notification, and rack inlet temperature control.
4. Top or bottom piping connections
5. Remote probe guarantees inlet temperature to IT equipment.
6. Capacity Regulation prevents compressor cycling through the use of hot gas bypass
7. Scroll compressor
8. Condensate management – factory installed dual pumps remove water from the unit, ensuring continuous operation.
9. Castors allow for easy

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Performance Specifications

Net Cooling Capacity (Air and Glycol Cooled)			
Return Air Temperature	**SKU**	**Total Capacity kW (BTU/hr)**	**Sensible Capacity kW (BTU/hr)**
72ºF DB, 60ºF WB (22.2ºC DB, 15.5ºC WB)	ACRD100/200	8.22 (28000)	8.04 (27400)
	ACRD101/201	8.01 (27200)	7.71 (26400)
75ºF DB, 61.1ºF WB (23.9ºC DB, 16.2ºC WB)	ACRD100/200	8.52 (29000)	8.52 (29000)
	ACRD101/201	8.16 (27900)	8.16 (27900)
80ºF DB, 67.0ºF WB (26.7ºC DB, 19.4ºC WB)	ACRD100/200	10.02 (34000)	9.12 (31000)
	ACRD101/201	9.72 (33200)	8.85 (30200)
80ºF DB, 62.8ºF WB (26.7ºC DB, 17.1ºC WB)	ACRD100	9.36 (32000)	9.36 (32000)
	ACRD101	8.97 (30700)	8.97 (30700)
	ACRD200	10.02 (34000)	(9.12 (31000)
	ACRD201	9.72 (33200)	8.85 (30200)
85ºF DB, 64.6ºF WB (29.4ºC DB, 18.1ºC WB)	ACRD100/200	9.90 (33800)	9.90 (33800)
	ACRD101/201	9.69 (33100)	9.69 (33100)
90ºF DB, 66.2ºF WB (32.2ºC DB, 19.0ºC WB)[1]	ACRD100/200	10.44 (35600)	10.44 (35600)
	ACRD101/201	10.29 (35200)	10.29 (35200)
95ºF DB, 67.8ºF WB (35.0ºC DB, 19.9ºC WB)[2]	ACRD100/200	10.62 (36200)	10.62 (36200)
	ACRD101/201	10.51 (35900)	10.51 (35900)
100ºF DB, 69.3ºF WB (37.8ºC DB, 20.7ºC WB)[3]	ACRD100/200	10.62 (36200)	10.62 (36200)
	ACRD101/201	10.51 (35900)	10.51 (35900)
105ºF DB, 70.8ºF WB (40.6ºC DB, 21.6ºC WB)[4]	ACRD100/200	10.56 (36000)	10.56 (36000)
	ACRD101/201	10.51 (35,900)	10.51 (35,900)
110ºF DB, 72ºF WB (43.3ºC DB, 22.2ºC WB)[5]	ACRD100/200	10.6 (36000)	10.6 (36000)
	ACRD101/201	10.5 (35900)	10.5 (35900)

Airflow is 1081 l/s (2290 SCFM) at full evaporating fan speed.
1 Airflow is reduced to 887 l/s (1880 SCFM) at this condition to maintain adequate evaporating temperature.
2 Airflow is reduced to 717 l/s (1520 SCFM) at this condition to maintain adequate evaporating temperature.
3 Airflow is reduced to 599 l/s (1270 SCFM) at this condition to maintain adequate evaporating temperature.
4 Airflow is reduced to 510 l/s (1080 SCFM) at this condition to maintain adequate evaporating temperature.
5 Airflow is reduced to 448 l/s (950 SCFM) at this condition to maintain adequate evaporating temperature.
Note: Minimum recommended heat load is 2kW (6,831 BTU).
Note: For ACRD100 series the outdoor air temperature is 35° C (95° F).
Note: For ACRD200 series, a 40% at 0.64 l/s (10gpm), the entering glycol mixture temperature is 40.6° C (105° F).

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Performance Specifications

Net Cooling Capacity (Water Cooled)			
Return Air Temperature	**SKU**	**Total Capacity kW (BTU/hr)**	**Sensible Capacity kW (BTU/hr)**
72ºF DB, 60ºF WB (22.2ºC DB, 15.5ºC WB)	ACRD200	9.72 (33200)	8.94 (30500)
	ACRD201	9.57 (32700)	8.79 (30100)
75ºF DB, 61.1ºF WB (23.9ºC DB, 16.2ºC WB)	ACRD200	8.43 (32200)	8.43 (32200)
	ACRD201	9.30 (31800)	9.30 (31800)
80ºF DB, 67ºF WB (26.7ºC DB, 19.4ºC WB)	ACRD200	11.52 (39300)	9.90 (33800)
	ACRD201	11.64 (39800)	9.99 (34200)
80ºF DB, 62.8ºF WB (26.7ºC DB, 17.1ºC WB)	ACRD200	10.38 (35400)	10.38 (35400)
	ACRD201	10.11 (34500)	10.11 (34500)
85ºF DB, 64.6ºF WB (29.4ºC DB, 18.1ºC WB)	ACRD200	10.92 (37300)	10.92 (37300)
	ACRD201	10.98 (37500)	10.98 (37500)
90ºF DB, 66.2ºF WB (32.2ºC DB, 19.0ºC WB)[1]	ACRD200	11.64 (39700)	11.64 (39700)
	ACRD201	11.76 (40200)	11.76 (40200)
95ºF DB, 67.8ºF WB (35.0ºC DB, 19.9ºC WB)[2]	ACRD200	11.98 (40900)	11.98 (40900)
	ACRD201	12.00 (41000)	12.00 (41000)
100ºF DB, 69.3ºF WB (37.8ºC DB, 20.7ºC WB)[3]	ACRD200	12.06 (41150)	12.06 (41150)
	ACRD201	12.00 (41000)	12.00 (41000)
105ºF DB, 70.8ºF WB (40.6ºC DB, 21.6ºC WB)[4]	ACRD200	12.06 (41150)	12.06 (41150)
	ACRD201	12.00 (41000)	12.00 (41000)
110ºF DB, 72ºF WB (43.3ºC DB, 22.2ºC WB)[5]	ACRD200	12.06 (41200)	12.06 (41200)
	ACRD201	12.06 (41200)	12.06 (41200)

1 Airflow is reduced to 887 l/s (1880 SCFM) at this condition to maintain adequate evaporating temperature.
2 Airflow is reduced to 717 l/s (1520 SCFM) at this condition to maintain adequate evaporating temperature.
3 Airflow is reduced to 599 l/s (1270 SCFM) at this condition to maintain adequate evaporating temperature.
4 Airflow is reduced to 510 l/s (1080 SCFM) at this condition to maintain adequate evaporating temperature.
5 Airflow is reduced to 448 l/s (950 SCFM) at this condition to maintain adequate evaporating temperature.
Note: Minimum recommended heat load is 2kW (6,831 BTU).
Note: A 0.64 l/s (10gpm) entering water temperature is 29.4°C (85°F).

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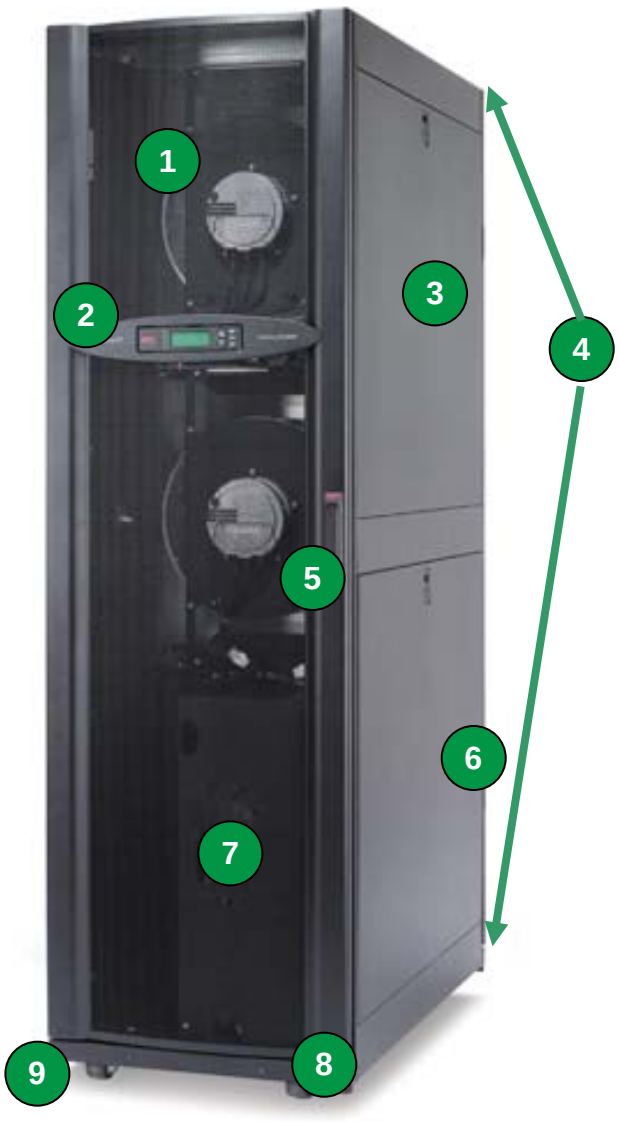
InRow® RD and RP 600mm

Air cooled, row-based cooling for small to medium data centers.

10–37kW



1. Variable speed fans reduce energy consumption during off-peak hours
2. Intelligent control offer network manageability, real time capacity monitoring, predictive failure notification, and rack inlet temperature control.
3. Electric reheat controls temperature during dehumidification **(RP only)**
4. Top or bottom piping connections
5. Remote probe guarantees inlet temperature to IT equipment.
6. Humidifier maintains moisture level **(RP only)**
7. Variable speed reciprocating compressor using VFD control
8. Condensate management – factory installed pump removes water from the unit, ensuring continuous operation.
9. Castors allow for easy movement

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Performance Specifications

Net Cooling Capacity			
Return Air Temperature	**SKU**	**Total Capacity kW (BTU/hr)**	**Sensible Capacity kW (BTU/hr)**
72ºF DB, 60.0ºF WB (22.2ºC DB, 15.5ºC WB)	ACRD500 / ACRP100	22.8 (78000)	19.0 (65000)
	ACRD501 / ACRP101	22.8 (78000)	19.0 (65000)
	ACRD502 / ACRP102	22.8 (78000)	19.0 (65000)
75ºF DB, 61.1ºF WB (23.9ºC DB, 16.2ºC WB)	ACRD500 / ACRP100	25.2 (86000)	21.7 (74000)
	ACRD501 / ACRP101	25.2 (86000)	21.7 (74000)
	ACRD502 / ACRP102	25.2 (86000)	21.7 (74000)
80ºF DB, 62.8ºF WB (26.7ºC DB, 17.1ºC WB)	ACRD500 / ACRP100	26.9 (92000)	26.9 (92000)
	ACRD501 / ACRP101	26.9 (92000)	26.9 (92000)
	ACRD502 / ACRP102	26.9 (92000)	26.9 (92000)
85ºF DB, 64.6ºF WB (29.4ºC DB, 18.1ºC WB)	ACRD500 / ACRP100	29.0 (99000)	29.0 (99000)
	ACRD501 / ACRP101	29.0 (99000)	29.0 (99000)
	ACRD502 / ACRP102	29.0 (99000)	29.0 (99000)
90ºF DB, 66.2ºF WB (32.2ºC DB, 19.0ºC WB)	ACRD500 / ACRP100	30.5 (104000)	30.5 (104000)
	ACRD501 / ACRP101	30.5 (104000)	30.5 (104000)
	ACRD502 / ACRP102	30.5 (104000)	30.5 (104000)
95ºF DB, 67.8ºF WB (35.0ºC DB, 19.9ºC WB)	ACRD500 / ACRP100	33.7 (115000)	33.7 (115000)
	ACRD501 / ACRP101	33.7 (115000)	33.7 (115000)
	ACRD502 / ACRP102	33.7 (115000)	33.7 (115000)
100ºF DB, 69.3ºF WB (37.8ºC DB, 20.7ºC WB)	ACRD500 / ACRP100	36.9 (126000)	36.9 (126000)
	ACRD501 / ACRP101	36.9 (126000)	36.9 (126000)
	ACRD502 / ACRP102	36.9 (126000)	36.9 (126000)
105ºF DB, 70.8ºF WB (40.6ºC DB, 21.6ºC WB)[1]	ACRD500 / ACRP100	36.6 (125000)	36.6 (125000)
	ACRD501 / ACRP101	36.6 (125000)	36.6 (125000)
	ACRD502 / ACRP102	36.6 (125000)	36.6 (125000)

Airflow for the ACRD500 series is 2171 l/s (4600 SCFM) at full evaporating fan speed.
Note: Minimum recommended heat load is 10kW (34,152 BTU).
Note: For ACRD500 series the outdoor air temperature is 35° C (95° F).
Note: For ACRD500 series, reduce airflow and cooling capacity specifications by 7% for cooling units run at low input voltage (380 V).
1 Airflow reduced to 4000 SCFM at this condition to maintain adequate return gas temperature.
Note: Shaded lines represent leaving air temperatures above ASHRAE specifications of 25°C (77º F) at maximum airflow.
Note: Reduce airflow and cooling capacity specifications by 7% for cooling units run at low input voltage (380 V).

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Electrical Data

SKU	Voltage (Volts)	Phase	Frequency (Hz)	Power (Watts)	Plug
ACSC100	208-230	1	60	2940	NEMA L6-20P
ACSC101	220-240	1	50	2390	IEC 309 16A 2P+E
ACRD100	208-240	1	60	4600	hardwired
ACRD101	220-240	1	50	4400	hardwired
ACRD200	208-240	1	60	4600	hardwired
ACRD201	220-240	1	50	4400	hardwired
ACRD500	200-240	3	50/60	15000	hardwired
ACRD501	460-480	3	60	16000	hardwired
ACRD502	380-415	3	50	16000	hardwired
ACRP100	200-240	3	50/60	19000	hardwired
ACRP101	460-480	3	60	21000	hardwired
ACRP102	380-415	3	50	20000	hardwired

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