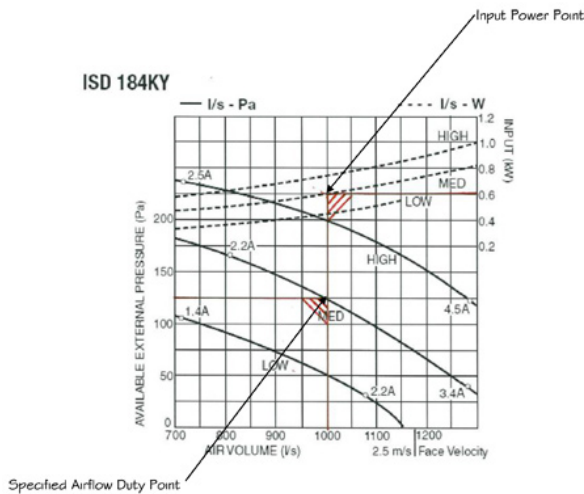


# Fan Input Power Calculation Made Easy



Consultants and Contractors, who are designing or certifying an installation, must calculate the Maximum Fan Power for the entire system. It is a requirement of the BCA, which is carried out at design stage (Table J5.2 of the BCA). This calculation takes into account the power input to all fans contained within the system, supply air fan, return air fan, outside air fan.

Fortunately, Temperzone has made it fairly easy for you to carry out this calculation. Temperzone's Product Manager Gordon Stewart takes you through a step by step process on how to calculate Fan Input Power using the Temperzone Unit Selection Program on the [www.temperzone.biz](http://www.temperzone.biz) website.

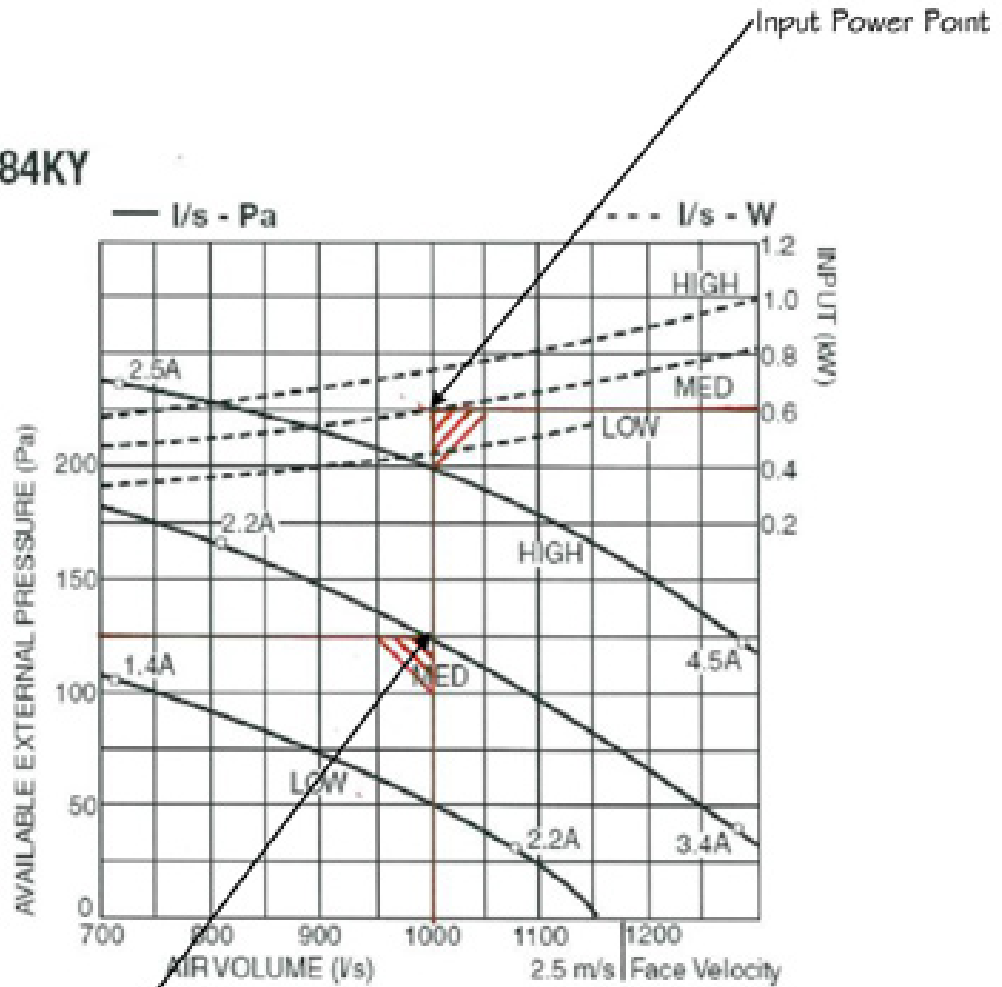
To find the input power to a direct drive motor used in temperzone equipment, this can be easily taken from our published fan curves as shown in the example below

## Example 1 – Direct Drive Motor

Input Power to ISD 184KY @ 1000 l/sec @ 125Pa external static

From the published fan curve, the fan should be running on medium speed, and by projecting above to the power input curves, the power input is 0.6kW (600 watts)

# ISD 184KY



Specified Airflow Duty Point

When using a Belt drive arrangement, it was not as easy to find the power input to the fan motor, until temperzone released the latest version of its USP (Unit selection Programme), which is found on our commercial web site, [www.temperzone.biz](http://www.temperzone.biz)

The motor Power Input for the fan is now shown on the printout of the USP; whether you are using a direct drive motor arrangement, or a belt drive arrangement

Example 2 – Belt Drive Motor


Input Power to OPA 294 @ 1600 l/sec @ 175 Pa

Zone Name	Assigned Unit	Airflow (l/s)	Total Cooling (kW)	Total Heating (kW)	
1					<a href="#">ZONE OPTIONS</a>
No unit has been specified for this zone					
<b>ZONE CRITERIA (optional)</b>					
Unit Type: <a href="#">DX Air Cooled Ducted Packaged Rooftop Units</a>					
External Static Pressure:	17 Pa	<b>Summer Air Conditions</b>		<b>Winter Air Conditions</b>	
<b>Airflow and Duties</b>		Return Air DB:	27 °C	Return Air DB:	15 °C
Return Airflow:	1000 l/s	Return Air WB:	19 °C	Outside Air DB:	7 °C
Fresh Airflow:	0 l/s	Return Air RH:	45.3 %	Mixed Air DB:	15 °C
Total Airflow:	1000 l/s	Outside Air DB:	35 °C	Maximum Leaving DB Temp:	35 °C
Cooling Total Duty:	20 kW	Outside Air WB:	23 °C		
Cooling Sensible Duty:	20 kW	Outside Air RH:	35.32 %		
Heating Capacity:	24 kW	Mixed Air DB:	27 °C		
Heating Net Duty:	24 kW	Mixed Air WB:	19 °C		
		Mixed Air RH:	45.3 %		
		Minimum Leaving DB Temp:	12 °C		
All unit performances are based on dry coil surface and without filters fitted and allowance should be made in the external static resistance for this.					
<a href="#">SHOW ALL MATCHING UNITS</a>					

Airflow & External Static are entered as part of the selection data required  
 After the selection has been made, Motor Power is shown under selected fan performance

Unit	Phase	Fan Speed	T. Cooling	S. Cooling	Heat	dB(A)	Airflow	Face	Static Press.
OPA 204RKT8	3	751 RPM	29.5	24.5	27.7	79	1600	0.993	175



**UNIT DATA**

Model: OPA 204RKT8  
 Coil Face Velocity m/s: 1.6  
 Nom. Filter Face Area m2: 0.9  
 Power Phase: 3  
 Outdoor Airflow Config.: Vertical  
 Indoor Airflow Config.: Horizontal

**COOLING**

	Required	Actual
Total Duty	28.8 kW	29.5 kW
Sensible Duty	20.0 kW	24.5 kW
Cooling COP/EER/SEER		3.24 / 3.22
Leaving DB		14.3 C
Leaving WB		14.8 C

**HEATING**

	Required	Actual
Gross Duty	24.0 kW	27.7 kW
Nett Duty	24.0 kW	27.7 kW
Heating COP/EACOP		3.72 / 3.70

**INDOOR NOISE LEVELS**

Speed	125	250	500	1k	2k	4k	dB(A)
650	71	69	72	69	67	65	74
750	75	73	75	76	73	71	81
820	75	74	79	78	75	73	82

**OUTDOOR NOISE LEVELS**

Speed	125	250	500	1k	2k	4k	dB(A)
650	64	57	52	52	46	44	57

**SELECTED FAN PERFORMANCE**

Speed:	751 RPM
Air Flow Ft3:	1600
External Static:	175 Pa
Motor Power:	1277 Watt

Once the unit has been selected, this information can then be printed out or saved as a pdf for electronic filing, motor power is shown under the fan performance.

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enquiry

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**1**  
**OPA 294RKTB**  
 Ducted Packaged Rooftop Units

Speed: 751 RPM  
 Air Flow l/s: 1600  
 Ext. Static: 175 Pa  
 Motor Power: 1277 Watt

Face Vel m/s: 1.6  
 Filter Face m2: 0.9  
 Power Phase: Three  
 Outdoor Config: Vertical

COOLING	RETURN	OUTSIDE	MIXED
DB (°C)	27.00	35.00	27.00
WB (°C)	19.00	23.00	19.00
RH (%)	46.30	35.32	46.30

	REQUIRED	ACTUAL
Total Duty	28.00	29.50
Sensible Duty	20.00	24.50
Leaving DB		14.35
Leaving WB		14.82

HEATING	RETURN	OUTSIDE	MIXED
DB (°C)	15.00	7.00	15.00

	REQUIRED	ACTUAL
Gross Duty	24.00	27.74
Nett Duty	24.00	27.74

NOISE	SPEED	125	250	500	1K	2K	4K	dB(A)
INDOOR	680	71	69	72	69	67	65	74
	750	75	73	78	76	73	71	81
	820	75	74	79	78	75	73	82
OUTDOOR	HIGH	64	57	52	52	46	44	57

This same method applies to direct drive motors

External Static

Airflow

Zone Name	Assigned Unit	Airflow (l/s)	Total Cooling (kW)	Total Heating (kW)	
1	OPA 204RkTB	1500	29.5	27.7	<a href="#">ZONE OPTIONS</a>
2					<a href="#">ZONE OPTIONS</a>

No unit has been specified for this zone

**ZONE CRITERIA (optional)**

Unit Type: [DX Air Cooled Ducted Split Systems](#)

External Static Pressure:  Pa

**Airflow and Duties**

Return Airflow:  l/s

Fresh Airflow:  l/s

Total Airflow:  l/s

Cooling Total Duty:  kW

Cooling Sensible Duty:  kW

Heating Capacity:  kW

Heating Net Duty:  kW

**Summer Air Conditions**

Return Air DB:  °C

Return Air WB:  °C

Return Air RH:  %

Outside Air DB:  °C

Outside Air WB:  °C

Outside Air RH:  %

Mixed Air DB:  °C

Mixed Air WB:  °C

Mixed Air RH:  %

Minimum Leaving DB Temp:  °C

**Winter Air Conditions**

Return Air DB:  °C

Outside Air DB:  °C

Mixed Air DB:  °C

Maximum Leaving DB Temp:  °C


All unit performances are based on dry coil surface and without filters fitted and allowance should be made in the external static resistance for this.

[SHOW ALL MATCHING UNITS](#)

After the selection has been made, Motor Power is shown under selected fan performance

AVAILABLE UNITS BASED ON YOUR REQUIREMENTS

Unit	Phase	Fan Speed	T. Cooling	S. Cooling	Heat	dB(A)	Airflow	Face	Static Press.
ISD 184KY / OSA 184RKTGH	3	HIGH	18.4	15.1	17.1	72	1000	0.47	200
<input checked="" type="checkbox"/> ISD 184KY / OSA 184RKTGH	3	HIGH	18.4	15.1	17.1	72	1000	0.47	200



**UNIT DATA**

Model: ISD 184KY / OSA 184RKTGH

Coil Face Velocity m/s: 2.1

Power Phase: 3

Outdoor Airflow Config: Horizontal

Indoor Airflow Config: Horizontal

**COOLING**

	Required	Actual
Total Duty	18.0 kW	18.4 kW
Sensible Duty	12.0 kW	15.1 kW
Cooling EER/AEER		3.20 / 3.21
Leaving DB		14.5 C
Leaving WB		14.8 C

**HEATING**

	Required	Actual
Gross Duty	16.0 kW	17.1 kW
Net Duty	16.0 kW	17.1 kW
Heating COP/A COP		3.84 / 3.82

**INDOOR NOISE LEVELS**

Speed 125 250 500 1k 2k 4k dB(A)

High 76 71 70 71 69 67 76

Low 71 64 63 62 61 58 68

Med 75 69 67 67 65 63 72

**OUTDOOR NOISE LEVELS**

Speed 125 250 500 1k 2k 4k dB(A)

High 61 49 50 47 43 35 52

Low 49 48 47 44 40 33 49

**SELECTED FAN PERFORMANCE**

Speed: HIGH

Air Flow l/s: 1000

External Static: 200 Pa

Motor Power: 740 Watt

Again, once the unit has been selected, this information can then be printed out or saved as a pdf for electronic filing, motor power is shown under the fan performance

2  
ISD 184KY / OSA 184RKTGH  
Ducted Split Systems

COOLING	RETURN	OUTSIDE	MIXED	REQUIRED	ACTUAL
DB (°C)	27.00	35.00	27.00	Total Duty	18.00 / 18.41
WB (°C)	19.00	23.00	19.00	Sensible Duty	12.00 / 15.14
RH (%)	46.30	35.32	46.30	Leaving DB	14.49
				Leaving WB	14.83

HEATING	RETURN	OUTSIDE	MIXED	REQUIRED	ACTUAL
DB (°C)	21.00	7.00	21.00	Gross Duty	16.00 / 17.06
				Net Duty	16.00 / 17.06

NOISE	SPEED	125	250	500	1K	2K	4K	dB(A)
INDOOR	High	76	71	70	71	69	67	76
	Low	71	64	63	62	61	58	68
	Med	75	69	67	67	65	63	72
OUTDOOR	High	61	49	50	47	43	35	52

Speed: HIGH  
Air Flow l/s: 1000  
Ext. Static: 200 Pa  
Motor Power: 740 Watt

Face Vel m/s: 2.1  
Power Phase: Three  
Outdoor Config: Horizontal  
Indoor Config: Horizontal

By using the temperzone USP, the Fan Motor Power Input is on record