

# Appendix

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# Appendix

## The Performance Monitor (PM2)

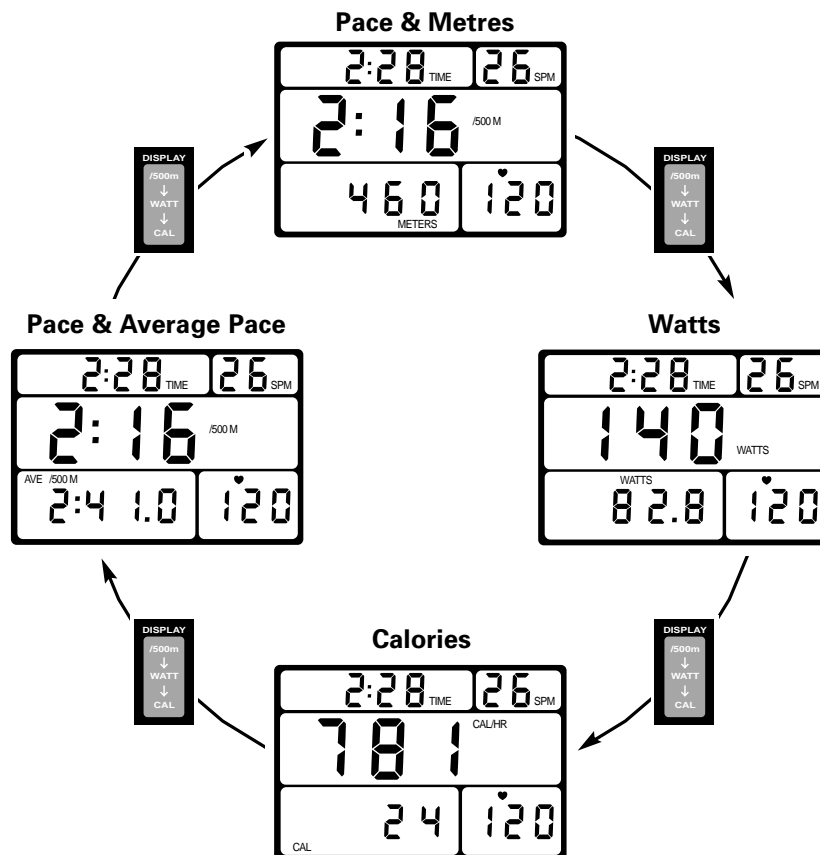
### Getting Started

When you begin rowing the monitor starts automatically, displaying information about your performance. Here is what it shows:

- **Elapsed Time.** How long you've been rowing.
- **Stroke Rate.** In strokes per minute (spm), updated every stroke.
- **Output for each stroke.** How hard you pulled on the last stroke. This is displayed in a choice of three units: pace/500m, calories/hour and watts.
- **Total or cumulative output.** Your cumulative output since you started rowing. Displayed in a choice of four units: average pace, metres, calories and watts.
- **Heart Rate.** If a heart rate interface is attached to the Indoor Rower and you are wearing a chestbelt transmitter, this display will show your heart rate in beats per minute.



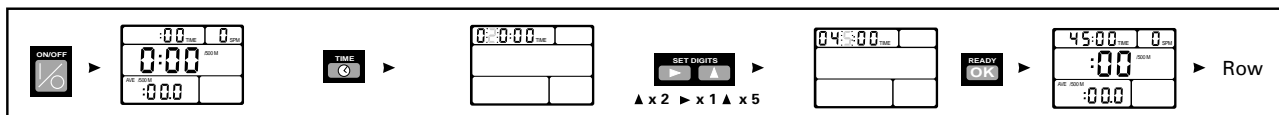
### Display Modes



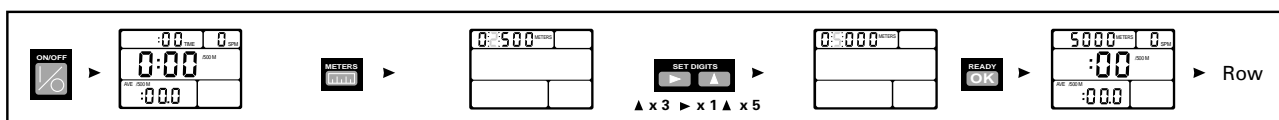
## Preset Workouts

You can set up four different types of workout on the monitor: pre-set time duration, pre-set distance, timed intervals and distance intervals. After you have finished a workout, you can use RECALL to view your performance. The sample workouts below are designed to help you become familiar with the monitor. We recommend you set them up as you read through each example. You may change the display mode before, during or after your workout.

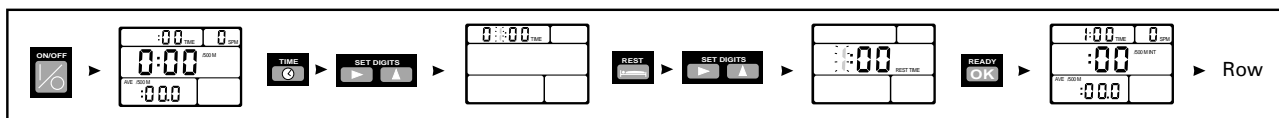
### Example 1: Pre-set Time (45 minute row)



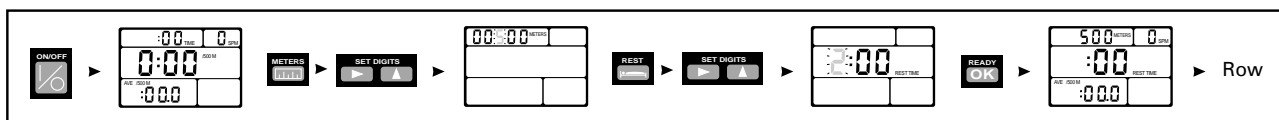
### Example 2: Pre-set Distance (5,000 metre row)



### Example 3: Time Intervals (10 x 1 minute hard/1 minute easy)



### Example 4: Distance Intervals (5 x 500 metres with 2 minutes rest)



During Examples 3 and 4 the interval number will be displayed in the upper right corner during the rest interval.

Your workout results will remain in the monitor's memory until another workout is started, even if it is turned off.

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## Recall

After you have finished a workout, you can use RECALL to view your performance during each split or interval of your workout.

**M**

The first press of the RECALL button displays the end of workout information. Each successive press of the RECALL button shows the next earlier split or interval until either the last split has been displayed or there is no more memory available (maximum storage is 20 splits or intervals).

The word SPLIT will appear on the screen to indicate that you are viewing split information as opposed to end of workout information. Default splits are two minutes for timed workouts and 500 metres for distance workouts.



The side arrow button works the same as RECALL. It shows the next earlier split or interval.



The up arrow button shows the next later split or interval.



The DISPLAY button can be used during split recall to view splits in different modes: /500m split pace, watts or calories.



Pressing REST during split recall shows splits in cumulative mode. This is indicated to the user by "CU" in the centre display field. Press REST again to exit CU mode.



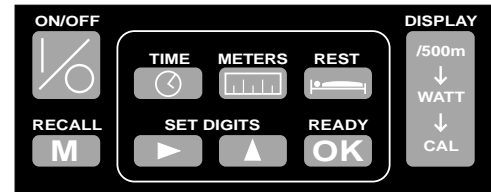
The heart rate box shows your heart rate at the end of each interval or split.



The SPM box shows your average strokes per minute for each interval or split.

## Extra Functions

All of the monitor buttons except the ON/OFF button have extra functions which are activated when you press and hold down the READY button.



### Splits

The monitor can record a maximum of 20 splits for a set time or distance.



**Custom Splits (time).** READY/TIME: To set custom splits (time) press READY and TIME together, then use the SET DIGITS buttons to set the split time. Press READY when done.



**Custom Splits (distance).** READY/METERS: To set custom splits (distance) press READY and METERS together, then use the SET DIGITS buttons to set the split distance. Press READY when done.



**Splits On/Off.** READY/RECALL: To display the split performance press READY and RECALL together. The split score will hold for five seconds in the lower left display window, and then return to the normal display. When the monitor starts up the splits option is off by default.

### Drag Factor



READY/REST: To display the drag factor press READY and REST together and then row a few strokes. The drag factor is useful if you use Concept 2 Indoor Rowers in different locations and want to be sure the resistance level is the same. The typical range for the drag factor is 100 (damper setting 1) to 220 (damper setting 10). When the monitor starts up the drag factor option is off by default.

### Odometers

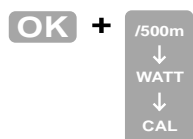


**Resettable.** READY/SET DIGITS ▲ : Displays cumulative distance rowed and is resettable. At 99,999m it rolls over to 00,000. Press RECALL to reset to 0. Press READY or ON/OFF to get out of this function.



**Non resettable.** READY/SET DIGITS ► : Displays cumulative distance rowed and is not resettable. Distance is in kilometres and is only displayed when READY and SET DIGITS ► are being pressed together.

### Display Test



READY/DISPLAY: Press READY and DISPLAY together and the monitor will perform a self-test displaying all segments. Press ON/OFF to end the test.

## The Performance Monitor (PM2+)

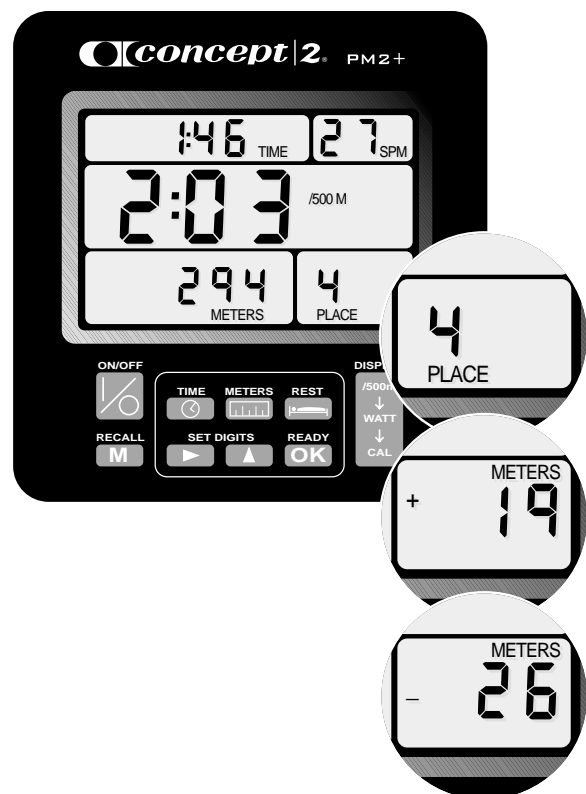
The PM2+ is the second generation of the PM2 and as such has the same standard features. There are additional serial ports on a PM2+ that allow you to link to a computer and therefore to other rowing machines, either directly, or over the internet. The e-Row software you need to do this is available to download free from the concept 2 website at [www.concept2.co.uk](http://www.concept2.co.uk). With e-Row you can create, save and modify races and workouts, connect to other PM2+s over the internet for racing, display races and workouts in 'Race', 'Spreadsheet', 'Powerplot', and 'LCD Monitor' views, and store data.

When using the PM2+ connected to either the internet or another machine the area of the monitor that normally shows the drag factor or heart rate shows your current position with meters ahead displayed with a + sign, and meters behind displayed with a - sign (see below). The number of meters shown indicate how far in front or behind you are. If you are not using the race facility then the PM2+ acts the same as the PM2. It will display heart rate when used in conjunction with a heart rate interface, or the drag factor if not.

Standard display showing heart rate:



Toggling race displays:

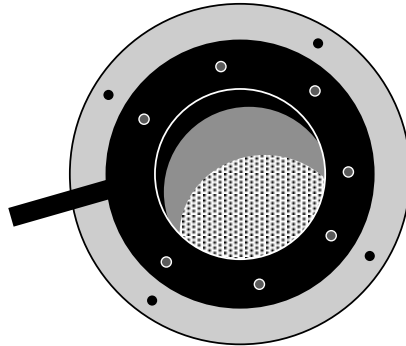


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## The Damper Lever and Drag Factor

The load on the Concept 2 Indoor Rower is unlike any normal resistance training equipment. There is no pre-set load; what is measured is the ability of the user to accelerate the flywheel overcoming the frictional force of the air opposing the flywheel rotation. The monitor display of the flywheel is a numerical calculation using the acceleration, speed of rotation and moment of inertia.



The damper lever on the side of the fan cage controls the drag factor. With the damper set to level 10 more air can pass across the fan increasing the rate of deceleration (drag). The monitor detects the increase in drag and an adjustment is made to the pace readout.

The monitor displays the drag factor as a number in the order of 100 at level 1 and around 220 at level 10 on a new machine. If the perforations on the fan cage become clogged, then to achieve the same drag factor the damper lever will need to be put on a higher setting. The monitor detects the effect on the flywheel not the position of the damper lever so although the setting on different machines may not be the same, the drag factor reading will always be correct.

Rowers on water use the machine in the range of 130 to 140 or level 3 to 4. The reason for this is that at this level the feel is closest to that of a racing boat therefore making the training rowing specific. Non-rowers using the machine for cross-training or as a sport in it's own right may benefit from a damper setting outside of this range.

As a general rule, bigger heavier and stronger users would tend towards level 10 while smaller lighter users would benefit from a lower setting.

It is a question of trial and error to find the most suitable setting for each individual. Once you have found the ideal set up note the drag factor rather than the damper lever setting, as this will remain constant across different machines.

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## Recommended Drag Factor Settings

International rowers train and test with the drag factor setting at a level of resistance that enables them to replicate their rhythm and rate from the water. Good rowing technique is about speed of application of power and not just brute strength.

The table below illustrates the settings recommended by the Amateur Rowing Association and used by Great Britain's international rowing teams for testing and training.

Recommended Drag Factors	
User	Drag Factor
J11/12 beginner	95-105 approx
J12/13	105-115
J13/14	110-120
J14/15	115-125
Junior Women	125-135
Junior Men	130-140
Lightweight women performance athletes	125
Heavyweight women performance athletes	130
Lightweight men performance athletes	135
Heavyweight men performance athletes	140



## 500m Split Time to Watts Conversion

To convert your 500m split time to watts either use the following equation or refer to the table below.

$$\text{Power (Watts)} = \frac{2.8}{(\text{pace})^3}$$

where pace is given as:  $\text{Pace} = \frac{\text{time (seconds)}}{\text{distance (metres)}}$

**Model C 500m Pace/Watts Conversion Table**

500m	4:01.0	3:11.3	2:47.1	2:31.8	2:20.9	2:12.6	2:06.0	2:00.5	1:55.9	1:51.9	1:48.4	1:45.3
Watts	25	50	75	100	125	150	175	200	225	250	275	300
500m	1:42.5	1:40.0	1:37.7	1:35.6	1:33.7	1:32.0	1:30.3	1:28.8	1:27.4	1:26.0	1:24.7	1:23.6
Watts	325	350	375	400	425	450	475	500	525	550	575	600

# Appendix

## Pace Guide

This pace guide will give you your finishing time for a variety of different workouts, provided you maintain an even pace for the duration of the row.

1,609m = 1 Mile

21,097m = 1/2 Marathon

42,195m = Full Marathon

Pace Guide							
500m	1,609m	2,000m	5,000m	10,000m	21,097m	42,195m	100,000m
1:10	3:45	4:40	11:40	23:20	0:49:14	1:38:27	3:53:20
1:12	3:52	4:48	12:00	24:00	0:50:38	1:41:16	4:00:00
1:14	3:58	4:56	12:20	24:40	0:52:02	1:44:05	4:06:40
1:16	4:05	5:04	12:40	25:20	0:53:27	1:46:54	4:13:20
1:18	4:11	5:12	13:00	26:00	0:54:51	1:49:42	4:20:00
1:20	4:17	5:20	13:20	26:40	0:56:16	1:52:31	4:26:40
1:22	4:24	5:28	13:40	27:20	0:57:40	1:55:20	4:33:20
1:24	4:30	5:36	14:00	28:00	0:59:04	1:58:09	4:40:00
1:26	4:37	5:44	14:20	28:40	1:00:29	2:00:58	4:46:40
1:28	4:43	5:52	14:40	29:20	1:01:53	2:03:46	4:53:20
1:30	4:50	6:00	15:00	30:00	1:03:18	2:06:35	5:00:00
1:32	4:56	6:08	15:20	30:40	1:04:42	2:09:24	5:06:40
1:34	5:02	6:16	15:40	31:20	1:06:06	2:12:13	5:13:20
1:36	5:09	6:24	16:00	32:00	1:07:31	2:15:01	5:20:00
1:38	5:15	6:32	16:20	32:40	1:08:55	2:17:50	5:26:40
1:40	5:22	6:40	16:40	33:20	1:10:20	2:20:39	5:33:20
1:42	5:28	6:48	17:00	34:00	1:11:44	2:23:28	5:40:00
1:44	5:35	6:56	17:20	34:40	1:13:08	2:26:17	5:46:40
1:46	5:41	7:04	17:40	35:20	1:14:33	2:29:05	5:53:20
1:48	5:48	7:12	18:00	36:00	1:15:57	2:31:54	6:00:00
1:50	5:54	7:20	18:20	36:40	1:17:22	2:34:43	6:06:40
1:52	6:00	7:28	18:40	37:20	1:18:46	2:37:32	6:13:20
1:54	6:07	7:36	19:00	38:00	1:20:10	2:40:20	6:20:00
1:56	6:13	7:44	19:20	38:40	1:21:35	2:43:09	6:26:40
1:58	6:20	7:52	19:40	39:20	1:22:59	2:45:58	6:33:20
2:00	6:26	8:00	20:00	40:00	1:24:24	2:48:47	6:40:00
2:02	6:33	8:08	20:20	40:40	1:25:48	2:51:36	6:46:40
2:04	6:39	8:16	20:40	41:20	1:27:12	2:54:24	6:53:20
2:06	6:45	8:24	21:00	42:00	1:28:37	2:57:13	7:00:00
2:08	6:52	8:32	21:20	42:40	1:30:01	3:00:02	7:06:40
2:10	6:58	8:40	21:40	43:20	1:31:25	3:02:51	7:13:20
2:12	7:05	8:48	22:00	44:00	1:32:50	3:05:39	7:20:00
2:14	7:11	8:56	22:20	44:40	1:34:14	3:08:28	7:26:40
2:16	7:18	9:04	22:40	45:20	1:35:39	3:11:17	7:33:20
2:18	7:24	9:12	23:00	46:00	1:37:03	3:14:06	7:40:00
2:20	7:31	9:20	23:20	46:40	1:38:27	3:16:55	7:46:40
2:22	7:37	9:28	23:40	47:20	1:39:52	3:19:43	7:53:20
2:24	7:43	9:36	24:00	48:00	1:41:16	3:22:32	8:00:00
2:26	7:50	9:44	24:20	48:40	1:42:41	3:25:21	8:06:40
2:28	7:56	9:52	24:40	49:20	1:44:05	3:28:10	8:13:20
2:30	8:03	10:00	25:00	50:00	1:45:29	3:30:59	8:20:00
2:32	8:09	10:08	25:20	50:40	1:46:54	3:33:47	8:26:40
2:34	8:16	10:16	25:40	51:20	1:48:18	3:36:36	8:33:20
2:36	8:22	10:24	26:00	52:00	1:49:43	3:39:25	8:40:00
2:38	8:28	10:32	26:20	52:40	1:51:07	3:42:14	8:46:40
2:40	8:35	10:40	26:40	53:20	1:52:31	3:45:02	8:53:20
2:42	8:41	10:48	27:00	54:00	1:53:56	3:47:51	9:00:00
2:44	8:48	10:56	27:20	54:40	1:55:20	3:50:40	9:06:40
2:46	8:54	11:04	27:40	55:20	1:56:45	3:53:29	9:13:20
2:48	9:01	11:12	28:00	56:00	1:58:09	3:56:18	9:20:00
2:50	9:07	11:20	28:20	56:40	1:59:33	3:59:06	9:26:40
2:52	9:13	11:28	28:40	57:20	2:00:58	4:01:55	9:33:20
2:54	9:20	11:36	29:00	58:00	2:02:22	4:04:44	9:40:00
2:56	9:26	11:44	29:20	58:40	2:03:46	4:07:33	9:46:40
2:58	9:33	11:52	29:40	59:20	2:05:11	4:10:21	9:53:20
3:00	9:39	12:00	30:00	60:00	2:06:35	4:13:10	10:00:00

## Weight Adjustment Factor (WAF)

When using an Indoor Rower the results that you can achieve are dependent on the power output you can maintain for the distance or time required. Heavyweight rowers are able to maintain a higher level of power output due to their increased weight. In order to enable you to compare your time/distance to someone of a different weight we have included a weight correction formula.

The formula for weight correction is:

$$\left[ \frac{\text{weight}}{77.27} \right]^{\frac{2}{9}}$$

### Using the Weight Adjustment Factor

For timed pieces:      Corrected time = actual time x WAF

For distance pieces:      Corrected distance =  $\frac{\text{actual distance}}{\text{WAF}}$

**Weight Adjustment Factors**

Weight (kg)	Factor	Weight (kg)	Factor	Weight (kg)	Factor	Weight (kg)	Factor
50.0	0.908	67.5	0.971	82.5	1.015	97.5	1.053
52.5	0.918	70.0	0.979	85.0	1.022	100.0	1.059
57.5	0.937	72.5	0.987	87.5	1.028	102.5	1.065
60.0	0.946	75.0	0.994	90.0	1.035	105.0	1.071
62.5	0.954	77.5	1.001	92.5	1.041	107.5	1.076
65.0	0.963	80.0	1.008	95.0	1.047	110.0	1.082



## Concept 2 Incentives

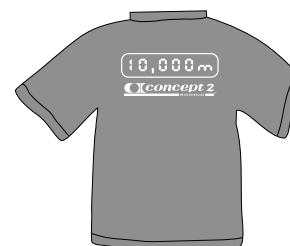
### Distance Award Scheme

The Distance Award Scheme provides a range of progressive distance incentives appropriate for each age group. When you reach each of your distance goals, send us a copy of the first and last pages of your training log signed by a witness for verification, and we'll send you your well-deserved Distance Award Scheme Certificate and T-shirt.

There is no time limit within which the distances have to be completed, so you may take as much or as little time as you wish.

#### Classification

- Junior - For anyone aged twelve or under, there are four Awards; 10,000m, 25,000m, 50,000m and 100,000m.
- Youth - For anyone aged between thirteen and eighteen, there are again four Awards; 100,000m, 250,000m, 500,000m and 1,000,000m.
- Senior - For anyone aged eighteen and over, the four Awards are: 1 million, 5 million, 10 million and 15 million metres.



**Distance Award Schemes**

Junior (up to 12)	10,000m	25,000m	50,000m	100,000m
Youth (13 to 18)	100,000m	250,000m	500,000m	1,000,000m
Senior (18+)	1,000,000m	5,000,000m	10,000,000m	15,000,000m

#### Notes

When you reach each of your distance goals, send a copy of the first and last pages of your training log, signed by a verifier, and you will receive a certificate and T-shirt. The metres from each award count towards the next.

# Appendix

## Concept Ranking

The Concept Ranking is published on-line at [www.concept2.co.uk](http://www.concept2.co.uk) annually and includes personal best performances for rowers throughout the UK and Republic of Ireland. Entries close on the 30th of April each year and are open to anybody in the UK and Republic of Ireland. The tables below detail the events and the age categories available.

Concept Ranking Events								
<b>Individual</b>	500m	2,000m	5,000m	10,000m	-	21,097m (1/2 marathon)	42,195m (marathon)	100,000m
<b>Team</b>	-	-	-	-	1 hour	-	42,195m (marathon)	100,000m

Concept Ranking Age Categories for 500, 2,000, 5,000 and 10,000 metres														
<b>Men</b>	J13	J14	J15	J16	J17	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
<b>Lwt Men</b>	-	-	-	-	-	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
<b>Women</b>	J13	J14	J15	J16	J17	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
<b>Lwt Women</b>	-	-	-	-	-	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99

### Notes

- i. Remember to use the pre-set distance to record your time to the nearest tenth of a second or else it will be defaulted to .9.
- ii. 1 hour and marathon teams must not exceed four members. Mixed teams must consist of at least half women i.e. one woman and one man, two women and one man, three women and one man or two women and two men.
- iii. 100,000m teams must not exceed ten members. Mixed teams must consist of at least one third women i.e. one women and up to two men, two women and up to four men, three or more women and up to six men.
- iv. For complete Team Relay and Marathon Guidelines please contact Concept 2 or visit [www.concept2.co.uk](http://www.concept2.co.uk)
- v. For the Full Marathon Team Event each team member must row a minimum of 2,000m per leg.
- vi. For the Half Marathon Team Event each team member must row a minimum of 1,000m per leg.
- vii. For the Half Marathon, Marathon and 100,000m events the minimum age requirement is 16 years. For the 10,000m and 5,000m events the minimum age is 13 years and for the 2,000m and 500m events the minimum age is 10 years.

## Indoor Races

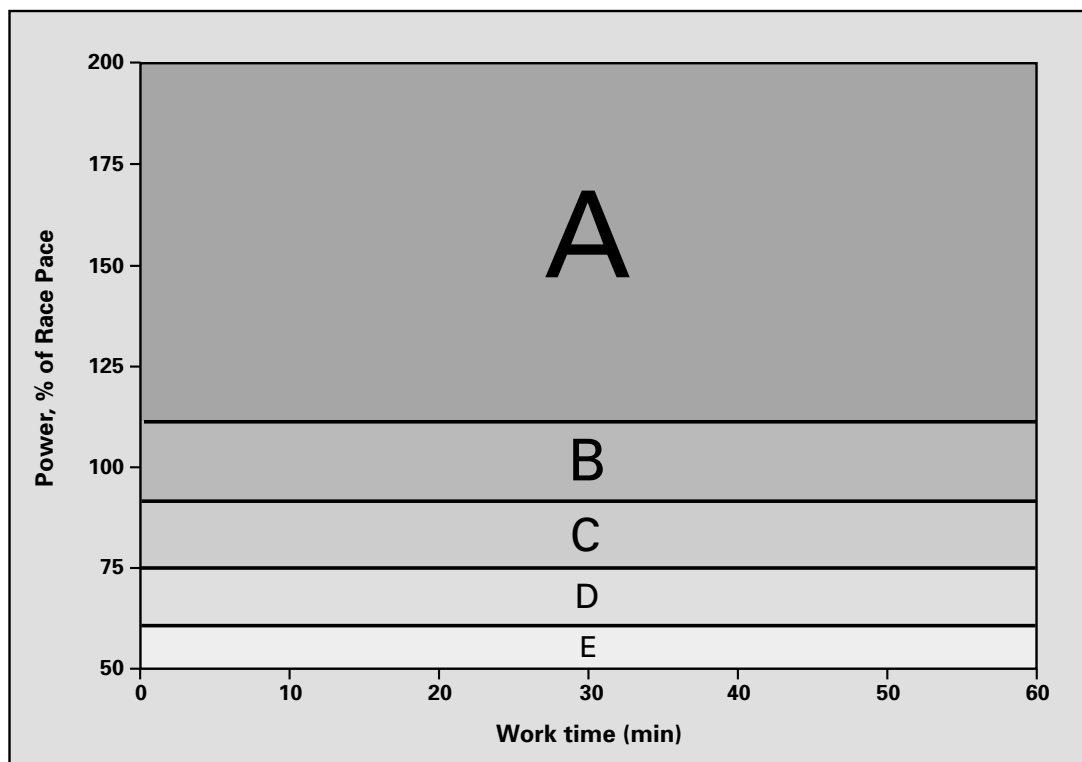
Indoor races come in all shapes and sizes. National and World Championships are staged annually over the 2,000m race distance. However, many other events choose different race formats. For an up-to-date race calendar check out the Concept 2 website ([www.concept2.co.uk](http://www.concept2.co.uk)).

Table 10.6

<b>Events Organised by Concept 2</b>	
British Indoor Rowing Championship (2,000m)	UK, each November
World Indoor Rowing Championship (2,000m)	Boston USA, each February
British Indoor Rowing Grand Prix	UK, each winter; October to March
European races	National and regional races throughout Europe, October to April

## Personalising Your Programme - the Danish Programme

These sheets relate to Section 4 : Creating a Bespoke Training Programme and can be used to plot your personal results.



Appendix

Training Intensities				
Training Intensity	Level	Split	Power (Watts)	Heart Rate
Anaerobic Capacity/Power	A			
Aerobic Capacity	B			
Aerobic Capacity/Endurance	C			
Endurance	D			
Recovery/Technical Improvement	E			

**Notes**  
Complete the table using the information from your graph.



## **Psychological Preparation Sheets**

The following three sheets relate to Section 9 : Sports Psychology and can be used to record your personal goals.

## Concept 2 Profile

Date: \_\_\_\_\_ Stage of Season: \_\_\_\_\_

Current aims: \_\_\_\_\_

Long-term aims: \_\_\_\_\_

Progress so far: \_\_\_\_\_

Training Focus (Mental, physical, technical)	Ideal (1-10)	Current Level (1-10)	Priority
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		
	10		

Fill in the various areas that you are trying to improve upon. The list can be as long or as short as you like. Fill in what you would score yourself out of ten for your current ability on each area. Look through the scores, work out your strengths (the things you should keep reminding yourself are good about you), and identify which areas score lower. These are going to be your priority areas to work on. Pick only two to three areas to work on at a time and rescore yourself on each area in five to six weeks time.

Once you've worked out what your priorities are, make a plan as to what you are going to do through your exercise that will particularly help you improve on these specific areas. Make sure you work out how your strengths are going to help you bring up the priority areas.

To help set some goals for each of these areas refer to the goal setting advice in Section 9 : Sports Psychology.

Appendix

## Ideal Race Plan

Fill in the ideal concentration cues for you that will keep you focused on thinking the right things for you at the right time.

**START**


**Think about what you need to think about!**  
Review... did you keep thinking the right things?

## Race Review System

Name: \_\_\_\_\_ Event: \_\_\_\_\_

Date: \_\_\_\_\_ Competition \_\_\_\_\_ Start Time: \_\_\_\_\_ am/pm

Finish Position: \_\_\_\_\_ Finish Time/Winning Time: \_\_\_\_\_

Environment: \_\_\_\_\_

Key Warm-up/Preparation Details: \_\_\_\_\_

\_\_\_\_\_

Key Race Objectives	Positive Outcomes	Negative Outcomes

Training pointers: \_\_\_\_\_

Future racing reminders: \_\_\_\_\_

Overall satisfaction level of performance (not result): \_\_\_\_\_ %