

---

**PERFORMANCE SPECIFICATIONS**  
for  
**Model B750RR Balancing Machine**

## 1 General Description

### 1.1 Balancing Machine

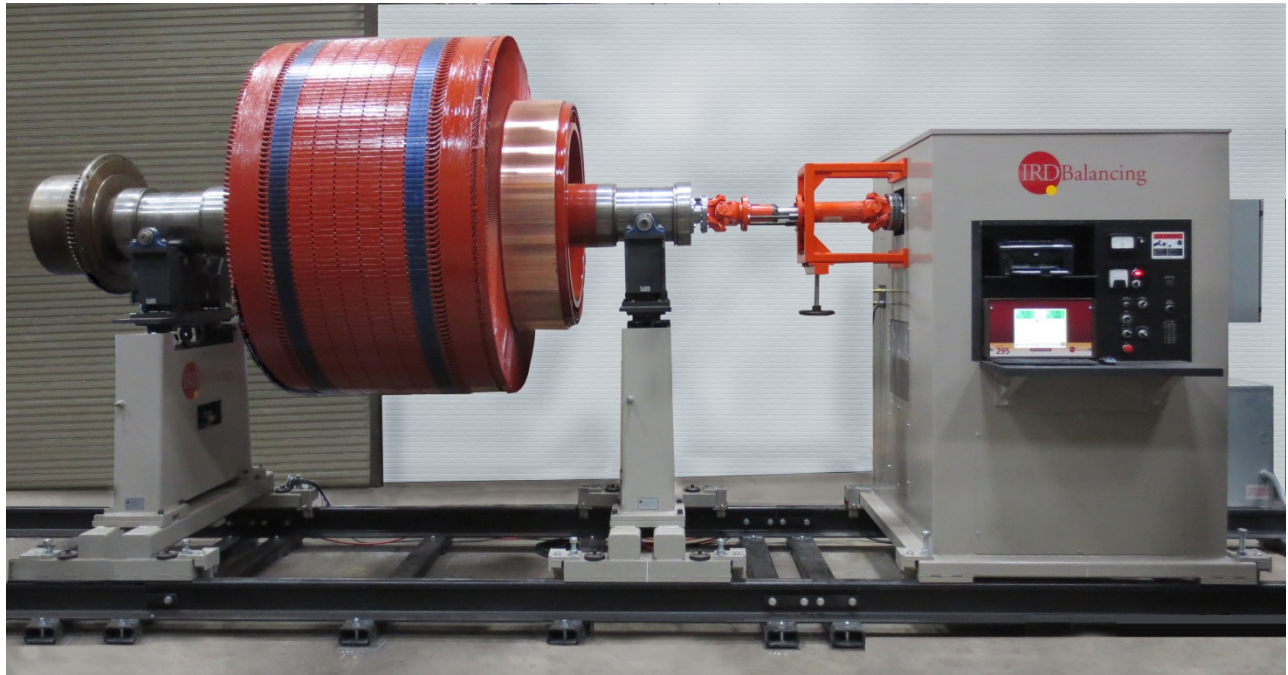
The Model B750RR is a dynamic, horizontal axis, super critical (above resonance) Balancing Machine that utilizes velocity transducers to measure the displacement generated by unbalance. The B750RR has an end drive console with a variable speed motor and multi-speed gearbox for efficient transfer of torque to the rotor. The end drive system uses a Cardan shaft to spin the rotor. Adapters to attach the rotor are the customer's responsibility. The use of a Cardan shaft may require electronic tooling compensation (a feature of the Model 295 instrument) to eliminate errors due to fit up and /or unbalance in the adapter tooling.

The machine and instrument are easy to use and set up. The standard calibration method uses trial weights to calibrate the rotor to the balancing instrument for the most accurate possible unbalance readout.

The machine can be mounted to most industrial floors without modification.

### 1.2 Instrumentation

The standard balancing instrument available with the B750RR is the Model 295, which has large digital display meters and shaft synchronous digital filters. Dynamic (left/right), static, and couple unbalance can be displayed. Individual rotor setups can be stored and the balance results can be printed on a printer that is also included with the B750RR. The instrument also displays the angular position of the rotor to aid in placing the correction weights. Detailed specifications of the Model 295 instrument are separate from these performance specifications.



B750RR – Representative only

## 2 Specifications

### 2.1 Rotor Mass and Unbalance Limitations

2.1.1 Maximum Weight Capacity	34 000 kg	(75,000 pounds)
2.1.2 Maximum Weight per Support*	22 600 kg	(50,000 pounds)
2.1.3 Minimum Weight	230 kg	(500 pounds)
2.1.4 Minimum Achievable Residual Unbalance ( $U_{mar}$ ) per plane†	.2 g·mm/kg	(.004 g·in/lb)
†But not less than	100 g·mm	(4 g·in)
2.1.5 Unbalance Reduction Ratio	95%	

*\*Total rotor weight not to exceed amount listed in paragraph 2.1.1 above.*

### 2.2 Rotor Dimensions

2.2.1 Maximum Rotor Diameter	3302 mm	(130 in)
2.2.2 Journal Diameter Range		
Standard Rollers	102 to 508 mm	(4 to 20 in)
Optional Small Rollers	51 to 254 mm	(2 to 10 in)
2.2.3 Maximum Distance Between Support Pedestal Centerlines	6299 mm	(248 in)
2.2.4 Minimum Distance Between Support Pedestal Centerlines	406 mm	(16 in)
2.2.5 Rotor Centerline From Top of Base		
On 51 mm Journal Diameter	1632 mm	(64.25 in)
On 508 mm Journal Diameter	1886 mm	(74.25 in)
Top of Base to Floor	275 mm	(10.81 in)
(Additional swing radius outboard of base)		
2.2.6 Maximum Difference in Rotor Journal Diameters	152 mm	(6 in)

## 2.3 Drive System

2.3.1 Drive System Type	End Drive, DC motor with multi-speed gearbox and fixed length Cardan shaft.	
2.3.2 Cardan Shaft		
Type	Universal Joint	
Length	965 mm	(38 in)
Weight	39 kg	(85 lbs)
Maximum Torque	8800 N·m	(6500 lb·ft)
Angle From Horizontal		
Maximum	±12°	
For Stated $U_{mar}$	±3°	
Maximum Unbalance error		
Systematic (see notes)	1440 g·mm	(56 g·in)
Note 1. Systematic errors are repeatable errors that can be compensated for by index balancing.		
Note 2. Non-systematic errors are errors whose maximum value is known but cannot be compensated for by index balancing.		
Note 3. Additional systematic unbalance measurement errors (due to unbalance and eccentricity) occur when adapters are used between the rotor and the driveshaft. These should be estimated and added to the driveshaft errors to determine the total error due to the attachment tooling.		
2.3.3 Motor	DC variable speed, drip proof frame with cooling blower	
2.3.4 Supply Voltage	460 VAC +/- 10%, 3 Phase, 50/60 Hertz, 120 A	
2.3.5 Rated Power	45 kW	(60 HP)
2.3.6 Output Torque, Maximum		
At Motor	372 N·m	(274 lb·ft)
At Cardan Shaft (gear 9)	297 N·m	(219 lb·ft)
At Cardan Shaft (gear 5)	1010 N·m	(745 lb·ft)
At Cardan Shaft (gear 1)	3760 N·m	(2773 lb·ft)
2.3.7 Acceleration Torque	Same as output torque	
2.3.8 Braking Torque	Same as output torque	
2.3.9 Motor Speed, Maximum		
At Motor	1150 rpm	
At Cardan Shaft (gear 9)	1438 rpm	
At Cardan Shaft (gear 5)	423 rpm	
At Cardan Shaft (gear 1)	114 rpm	
2.3.10 Type of Brake	Regenerative with supplementary air actuated disk brake for rotor holding	

- 2.3.11 Motor and Controller To NEMA and AMT Standards
- 2.3.12 Controller Speed Range 20:1
- 2.3.13 Balancing Speed 70 to 1438 rpm
- 2.3.14 Slow Roll Speed, minimum 5.4 rpm
- 2.3.15 Air Supply Requirement 480 to 690 kPa at .85 m/hr  
(70 to 100 psi at .5 cfm)
- 2.3.15 Gearbox Multi-speed, heavy duty gearbox with 11 speeds.  
Gearbox is located inside control console and is shifted only under no load conditions.

Gear	Min RPM	Max RPM
Low Rev	5.4	109
Hi Rev	18.5	370
1	5.7	114
2	8.6	172
3	11.6	231
4	15.7	315
5	21.1	423
6	29.2	584
7	39.3	786
8	53.6	1073
9	71.9	1438

### 3 Machine Components

#### 3.1 Machine Base

3.1.1 Length	10 059 mm	(396 in)
3.1.2 Width	1588 mm	(62.5 in)
3.1.3 Height	260 mm	(10.25 in)

#### 3.2 Work Supports

- 3.2.1 Two super critical (above resonance) pedestals.
- 3.2.2 Two electrodynamic, high output, moving coil, vibration transducers with calibration traceable to the National Institute of Standards and Technology (USA). (Transducers are furnished with Balancing Instrument.)
- 3.2.3 Two flat, universal mounting surfaces for roller bearing assemblies, V-Blocks, pivot assemblies, pillow blocks, and/or special mounting arrangements
- 3.2.4 Height adjustment in each work support provides 76 mm (3 in) of adjustment for difference in journal diameters – manually operated.
- 3.2.5 Left and right pedestals position adjustment along the full length of the base to accommodate various rotor lengths - manually operated.
- 3.2.6 Roller work support assemblies with gimbal action and precise, flat rollers that provide line contact with rotor journals. This reduces the risk of scoring or highly concentrated loads on the rotor journals.
- 3.2.7 Roller bearings that mount in the roller work support assemblies. 260 mm diameter x 136 mm wide (10.25 x 5.375 in). Rotor weight capacity (4 rollers): 34000 kg (75000 lbs). Optional smaller rollers available, see section 7.

#### 3.3 End Drive Console

- 3.3.1 The control console houses the DC motor and regenerative drive motor controller. An AC disconnect switch is mounted on the side and is completely mounted internally for operation on the specified AC supply voltage.
  - Note 1. An input cable from the customer's AC supply voltage source to the console disconnect switch is required. This is the customer's responsibility.
  - Note 2. A transformer for other voltages is optional.
  - Note 3. An isolation transformer between the console and the customer's AC supply is recommended. This is not required if a transformer is used to accommodate other voltages per Note 2.
- 3.3.2 Dual air actuated calipers and disc brake for rotor holding.
- 3.3.3 Multi-speed gearbox with 11 speeds.

- 3.3.4 A fixed length Cardan driveshaft is provided to connect the output shaft of the console to the rotor.
- 3.3.5 Operator controls consisting of start and stop pushbuttons, jog/run switch, speed control knob, brake off-norm switch with air pressure regulator and guage, and semi-automatic journal lubrication button.
- 3.3.6 AC Ampere meter with 0 to 200 Amp range, 3-position phase selector switch, and power indicator.
- 3.3.7 End thrust meter displaying 0 to 8500 Newton range (0 to 2000 lbs).
- 3.3.8 Rotor angle indicator on output shaft is graduated in 1° increments with a reference pointer for positioning the rotor.
- 3.3.9 Model 295 Balancing Instrument recommended (see section 3.4).
- 3.3.10 Printer for balance certificates
- 3.3.11 Operator writing shelf
- 3.3.12 Control for journal lubrication system
- 3.3.13 Accessory outlet for balancing instrument and printer
- 3.3.14 Motor reversing switch to change the direction of rotation of the rotor.

### 3.4 Instrumentation

- 3.4.1 Refer to the specification sheet for the selected IRD instrument.
- 3.4.2 Printer supplied with machine for balance certificates.

### 3.5 Standard Accessories

- 3.5.1 One (1) height adjusting tool
- 3.5.2 All associated cables and air hoses.
- 3.5.3 Cardan driveshaft
- 3.5.4 Driveshaft safety frame
- 3.5.5 Balancing machine operation manual (qty 2)
- 3.5.6 Manual for motor, drive controller, transmission, and Cardan shaft.
- 3.5.7 Lubrication fitting for roller assemblies.

#### 4 Paint

Standard color –Pedestals, Console, and Base

Warm Gray - Pantone 7C

#### 5 General Arrangement

See drawing E51399

##### 5.1 Overall Dimensions

5.1.1 Length	10 059 mm	(396 in)
5.1.2 Width	3048 mm	(120 in)
5.1.3 Height of console	2515 mm	(99 in)
5.1.4 Height with max. diameter rotor	4047 mm	(160 in)

##### 5.2 Weight and Shipping Dimensions

5.2.1 Net Weight	7741 kg	(17,065 lbs)
5.2.2 Shipping Weight		
Domestic	8047 kg	(17,740 lbs)
Export	8047 kg	(17,740 lbs)
5.2.3 Shipping Dimensions (3 Containers)		
5.2.3.1 Crate 1	1483 kg	(3270 lbs)
Length	3810 mm	(150 in)
Width	2286 mm	(90 in)
Height	1067 mm	(42 in)
5.2.3.1 Crate 2	3366 kg	(7420 lbs)
Length	3810 mm	(150 in)
Width	2286 mm	(90 in)
Height	1397 mm	(55 in)
5.2.3.1 Crate 3	3198 kg	(7050 lbs)
Length	2667 mm	(105 in)
Width	2032 mm	(80 in)
Height	2540 mm	(100 in)



## 6 Installation

### 6.1 Installation Requirements

Foundation: Normal 152 mm (6 in) thick reinforced concrete floor is recommended. No special heavy concrete substructure required as long as floor is stable, capable of supporting the weight of the balancing machine with maximum capacity rotor, and does not permit any pedestal motion during the balancing operation.

Base and Console Installation: The base and console must be lagged to the floor with standard expandable concrete anchors through the provided mounting holes. An installation drawing is provided with the machine and more detailed instructions can be found in the instruction manual also provided with the machine. The material and labor required to install the balancing machine is the responsibility of the customer.

## 7 Optional Modifications or Accessories

- 7.1 Roller set #2 – smaller roller bearings for balancing rotors with smaller journal areas. Includes four (4) rollers of 160 mm diameter x 76 mm wide (6.25 x 3 in) and four axles for installation in standard roller work support. Rotor weight capacity (4 rollers): 23000 kg (50000 lbs). P/N E16849
- 7.2 Negative load hold-down assembly rated at 26700 N (6000 lbs) for balancing rotors with outboard center of gravity, one recommended. P/N E16785
- 7.3 Rotor safety hold-down assembly – a safety device that prevents the rotor from lifting off the balancing machine, two recommended. P/N E17006
- 7.4 Base extension to increase support bearing separation – may be attached to machine base and to each other. Standard length is listed below.
  - 7.4.1 Base Extension            3353 mm            (132 in)            P/N E48674-1
- 7.5 Spare parts kit – includes rollers and axles, drive and control fuses, and operation manual.
- 7.6 Transformer for voltages other than standard AC supply voltage. Includes a 3.6 m (12 ft) interconnecting cable that can be wired into the disconnect switch on the control console. The cable between the AC source and the transformer is the responsibility of the customer.
- 7.7 Drive isolation transformer – recommended to protect the drive controller from AC line transients caused by other high current-draw equipment or by AC power disruptions. This is not required if the transformer from section 7.6 is used. The transformer includes a 3.6 m (12 ft) interconnecting cable that can be wired into the disconnect switch on the control console. The cable between the AC source and the transformer is the responsibility of the customer.

- 7.8 Pedestal risers to accommodate larger rotor diameters. Standard riser heights:
- |                      |         |         |
|----------------------|---------|---------|
| 7.8.1 Riser Option 1 | 305 mm  | (12 in) |
| 7.8.2 Riser Option 2 | 457 mm  | (18 in) |
| 7.8.3 Riser Option 3 | 610 mm  | (24 in) |
| 7.8.4 Riser Option 4 | 914 mm  | (36 in) |
| 7.8.5 Riser Option 5 | 1067 mm | (42 in) |
- 7.9 Larger drive motor and controller with regenerative braking.
- |                      |                |         |
|----------------------|----------------|---------|
| 7.9.1 Motor Option 1 | 56 kW (75 HP)  | 1150rpm |
| 7.9.2 Motor Option 2 | 75 kW (100 HP) | 1150rpm |
- 7.10 Medium duty precision U-joint Cardan driveshaft for lightweight rotors, fixed length.  
P/N E43673
- |   |           |              |
|---|-----------|--------------|
| 7.10.1 Length                                       | 965 mm    | (38 in)      |
| 7.10.2 Weight                                       | 24 kg     | (52 lbs)     |
| 7.10.3 Maximum torque                               | 4949 N·m  | (3650 lb·ft) |
| 7.10.4 Angle from Horizontal                        |           |              |
| Maximum   | ±12°      |              |
| For Stated Umar                                     | ±3°       |              |
| 7.10.5 Maximum Unbalance Error (see section 2.3.2). |           |              |
| Systematic  | 1440 g·mm | (56 g·in)    |
- 7.11 Light duty precision U-joint Cardan driveshaft for lightweight rotors, fixed length.  
P/N E35474
- |   |           |              |
|---|-----------|--------------|
| 7.11.1 Length                                       | 940 mm    | (37 in)      |
| 7.11.2 Weight                                       | 20 kg     | (45 lbs)     |
| 7.11.3 Maximum torque                               | 3254 N·m  | (2400 lb·ft) |
| 7.11.4 Angle from Horizontal                        |           |              |
| Maximum   | ±12°      |              |
| For Stated Umar                                     | ±3°       |              |
| 7.11.5 Maximum Unbalance Error (see section 2.3.2). |           |              |
| Systematic  | 1440 g·mm | (56 g·in)    |

## 8 Safety Note

Safety guards or enclosures are required to meet relevant safety regulations. It is the buyer's responsibility to ensure that the balancing machine has an adequate safety protection system before operating the machine.

<b>IRD LLC Offices</b> <a href="http://www.irdbalancing.com">www.irdbalancing.com</a> email: <a href="mailto:sales@irdbalancing.com">sales@irdbalancing.com</a>	<b>USA: Louisville, Kentucky</b> 1.502.366.0916 phone 1.502.238.1001 fax	
---	--	--

IRD LLC is a limited liability company, USA  
Standard machine configuration described, optional accessories or special order items may alter the specifications.  
Specifications in accordance with ISO 2953 abbreviated form.  
Specifications are subject to change without notice.