

# THE DACAPO COMPANY

## Dacapo Vision Strip-Wind Builder Compact Model



A compact strip wind builder with integral extruder and temperature control system.

The extruder is a plasti-screw type extruder with a variable speed motor drive to allow for a large range of rubber compounds and tyre sizes.

The roller die at the front end of the extruder will produce a very uniform rubber strip to build tyres with a minimum of variations in the applied tread weight.

The control system is continuously supervising the building process through several sensors and measurement devices to eliminate any errors in the built result:

- *The extruder temperature. The compound should be extruded under optimal conditions.*
- *The strip width. A line camera at the roller die is measuring the strip width. The measurement is used by the control system to correct the width by adjusting the speed of the roller die.*
- *Rubber temperature. A temperature sensor at the roller die will measure the temperature of the extruded rubber strip.*
- *Tyre measurement. A vision camera system above the tyre will measure the casing and the built tyre. The measurements are used to prevent any out-of-size casing from being built and to correct the building program for minor size variations.*

The PC is the operators interface to the builder. The PC is used to create building programs, to select which building program to use and to store statistical and measurement data.

- *A building program is created using a graphical picture of the tyre. Building program data is entered to a table. A practically unlimited number of building programs can be stored.*
- *The operator is changing to a new tyre size by selecting the adherent building program from a list. Extruder temperatures, extruder speed, tread profile etc are automatically set for the new building program without any other intervention from the operator. To change the building program will take from 5 seconds to 30 seconds, depending if the camera has to be repositioned or not.*
- *After finishing the building of a tyre, the PC will store all measured data about the casing and tyre as well as other process parameters. This data could be retrieved by tyre, by building program or by batch.*

Several builders could be networked together or to a server. A common database for building programs and process data could then be used.

Dacapo LTD  
Phone: +44 (0)1843 863829  
Fax: +44 (0)1843 862954

dacapo@thedacapocompany.com  
www.thedacapocompany.com

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## Builder features

### Standard builder equipment

- ✓ Integral 75 mm plasti-screw extruder
- ✓ Integral temperature control system, 2-4 zones.
- ✓ 30 kW extruder motor and drive.
- ✓ Roller dies to produce a very uniform rubber strip.
- ✓ Temperature sensor to measure the extruded strip temperature.
- ✓ Camera system to measure and control the casing and tyre profile.

### Process control using camera system

- ✓ The buffed casing is measured and checked to be within the set tolerances before being built.
- ✓ The building program is adjusted for size variations within set tolerances of the casing
- ✓ The built tyre is measured and checked to be within the set tolerances.

### Alarms - prevent from building a tyre

- ✓ The casing measurements are outside the set tolerances
- ✓ The extruder temperatures are outside the set tolerances

### Warnings - continue the building process

- ✓ Extruder load warning limit
- ✓ Extruder temperatures
- ✓ Extruded rubber temperature

### Alarms - stop the building process

- ✓ Extruder high load
- ✓ Broken strip

## Data storing

### Per building program or size

- ✓ Number of checked casings
- ✓ Number of built tyres
- ✓ Average building time
- ✓ Total rubber consumption

### Per batch

- ✓ Operator
- ✓ Batch start time
- ✓ Batch stop time
- ✓ Number of checked casings
- ✓ Number of built tyres
- ✓ Average building time
- ✓ Total rubber consumption

### Per operator

- ✓ Operator log-in time
- ✓ Operator log-out time
- ✓ Number of checked casings
- ✓ Number of built tyres
- ✓ Average building time
- ✓ Total rubber consumption

### Per tyre

- ✓ Building program / size
- ✓ Tyre ID
- ✓ Date / time
- ✓ Operator
- ✓ Rubber compound name
- ✓ Rubber compound batch
- ✓ Rubber compound lot
- ✓ Rubber used weight
- ✓ Building time
- ✓ Extruder mean load
- ✓ Extruder speed
- ✓ Strip mean / max / min stretch
- ✓ Extruder mean temperatures
- ✓ Extruded mean / max / min strip temperature
- ✓ Casing measurements
- ✓ Built tyre measurements

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## Technical specification

### Physical dimensions

Weight 3500 kg  
Size (L x D x H, mm) 3600 x 1400 x 2500 (height = 2000 mm without camera arm)

### Utility requirements

Air 7-10 bar, clean dry air  
Main supply 3x400VAC + PE  
Frequency 50 Hz  
Nominal current 80A

### Extruder

Type 75-mm plasti-screw  
Motor size 30kW  
Speed 10-85 RPM  
Capacity 240 - 300 kg/h  
Typical building time  
12" < 20s  
15" < 40 s  
25" < 400 s

### Tyre size capacity

Maximum diameter 1500 mm  
Bead width 125 mm - 460 mm with standard hub assembly  
Bead diameter 12" - 25" with standard hub assembly

### Water temperature control system

Number of zones 2 expandable to 4  
Temperature accuracy  $\pm 1.5^{\circ}$   
Chiller system Not included, choose from:

- Customer supplied cooling water
- External fan chiller
- External processing water chiller

### CE regulations and standards

Machine safety regulations EN292-1 and EN292-1 following the provision of directive 89/392/EEC with amendments  
EMC regulations following the provisions of directive 89/336/EEC  
Electrical equipment of machines EN 60-201-1 following the provisions of directive 73/23/EEC

### Spare parts and service.

The builder is designed using only well know high quality components. Spare parts are available Worldwide from the suppliers as well as through Dacapo LTD.

PLC system	Modicon	from	Schneider automation
Motor drives	Altivar 58	from	Telemecanique
Vision system	Visionscape	from	RVSI Acuity
Gear boxes	Various models	from	Benzler
Pneumatics		from	Rexroth
Etc.			