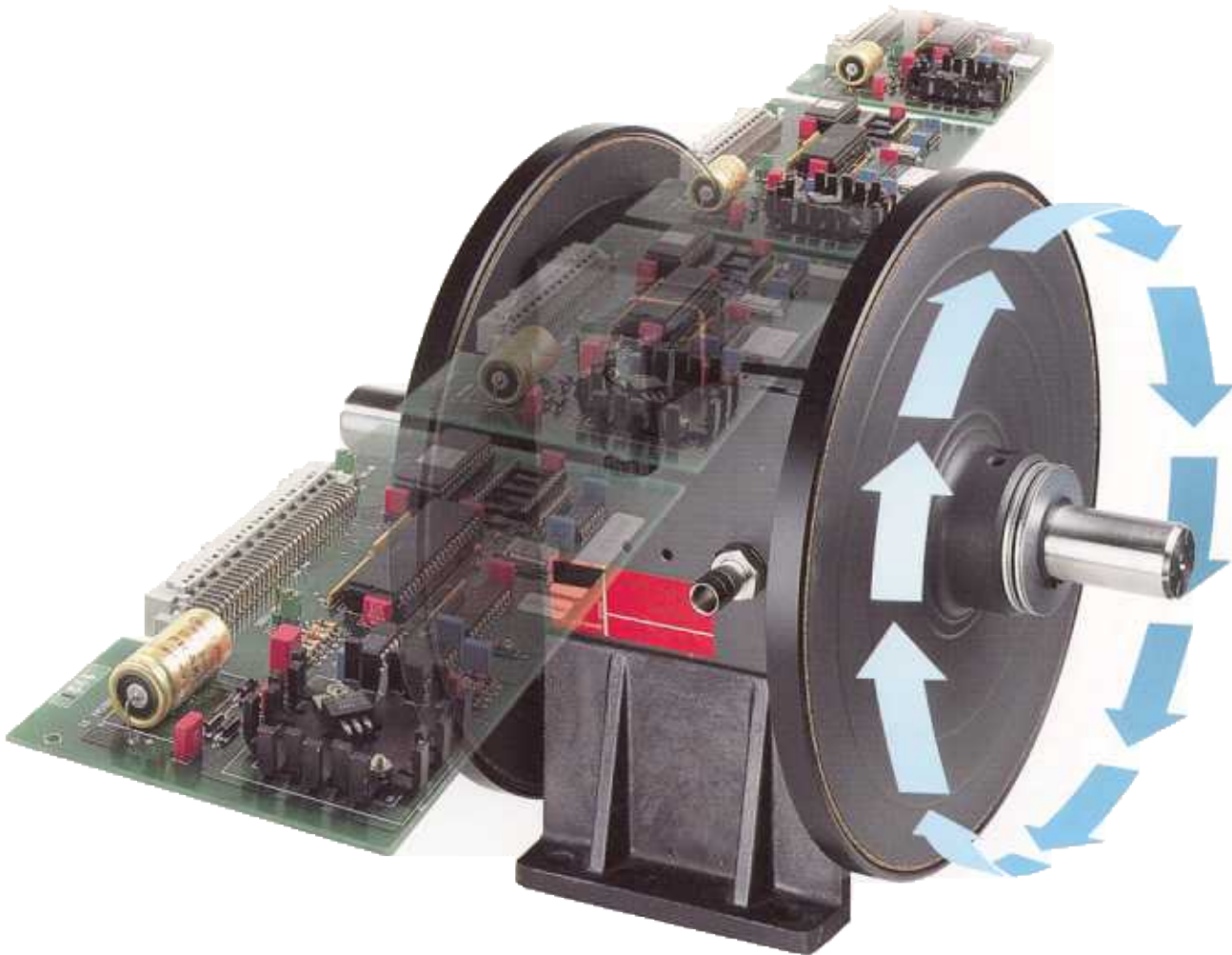




**Precision
Step Systems**



Precision Step Systems for fast and accurate positioning

LAURENCE, SCOTT & ELECTROMOTORS LTD.

Precision Step Systems – when the demands are

High precision

- Graphic machinery, silk screen/label printing, stamping
- Packaging machinery, auger feeding, labelling, film feed
- Cutting and stamping machinery, item feed
- Positioning of index tables



High cycling frequency

- Brewing machinery, bottle distribution and sorting
- Box folding machinery
- Industrial sewing machinery
- Cut-off with rotating knives and cutters



High flexibility

- Plastic bag making machinery
- Flowpack machinery
- Dispensing machinery
- Cutting and stamping machinery, material feed



Long life

- High-speed labelling
- Cutters
- Sorting
- Positioning of index tables



System

Is the prerequisite for your production machinery the ability to handle tasks which demand extremely fast and precise positioning of drive shafts?

Then the Precision Step System is the ideal solution.

Because of its unique construction, the system is superior with respect to cycling frequency, precision, greater operating reliability and low service costs.

The Precision Step System can start and stop up to 3600 times per minute, depending on load and size, while maintaining its high level of precision.

At feeding rates of approx. 1 m/sec., the tolerance is typically less than $\pm 0,1$ mm.

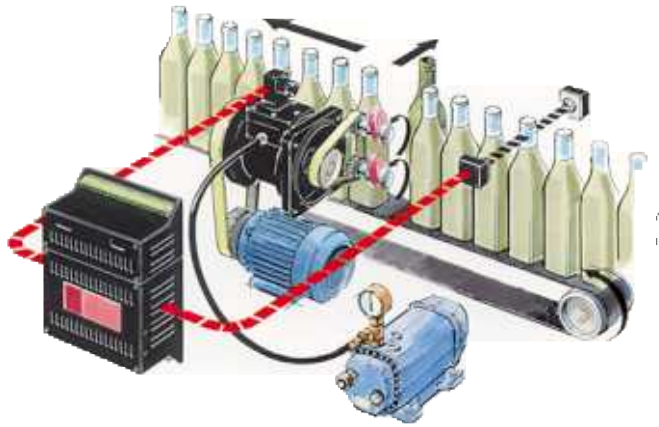
A family of electronic controls based on the modular approach makes the Precision Step System easy to use and extremely flexible.

The electronic controls have been designed to satisfy the demand for functions that include: counting, sensing, activating, clutching out, compensating, etc. Controls with specific logic function tailored for the needs of individual customers are also available.

Electronic sensors, encoders and vacuum pumps have been carefully specified and are available as options to ensure optimum system performance.

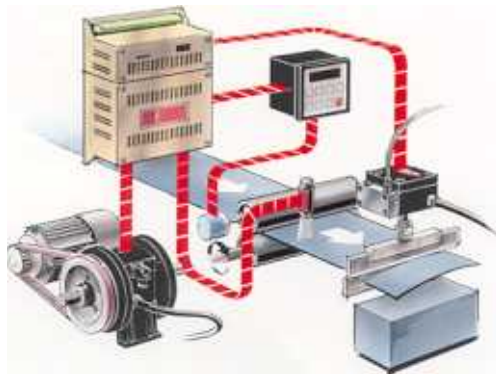
The Precision Step System consists of:

- SRA – mechanical step units
- SRB – electronic control units
- SRC – signal sources
- SRD – vacuum pump and accessories



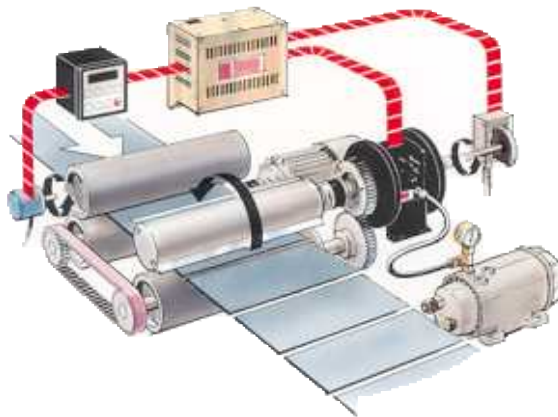
Sorting

- high cycling frequency
- short response time
- long life
- control from vision system



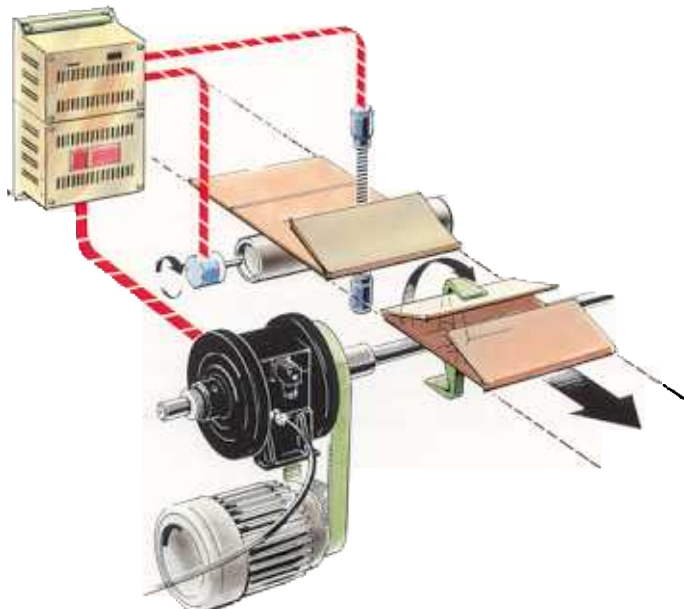
Linear feeding

- high positioning accuracy
- simple switching
- no error accumulation
- control based on counter and/or registration mark detection



Rotary knife

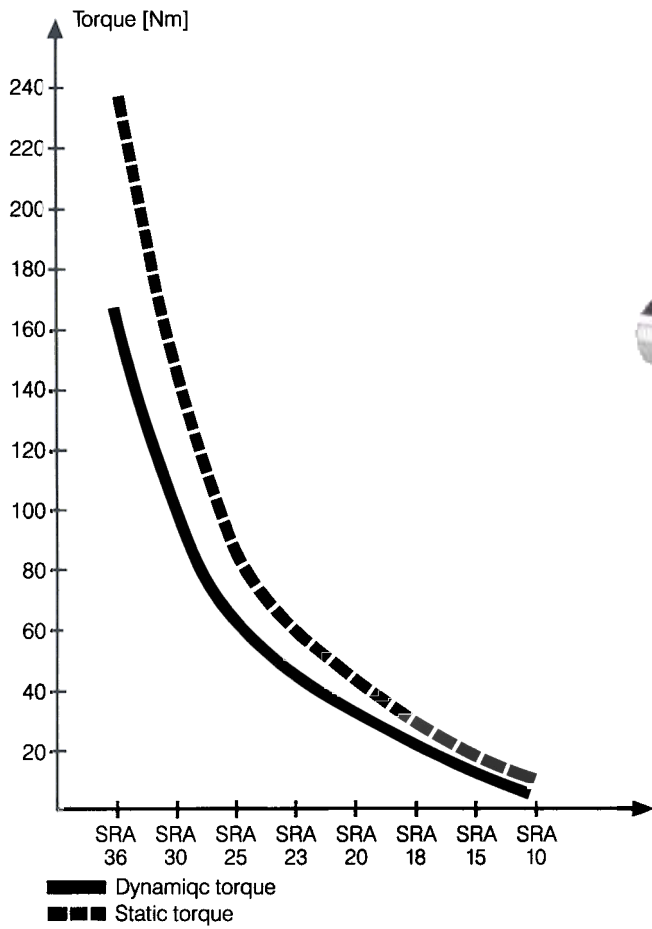
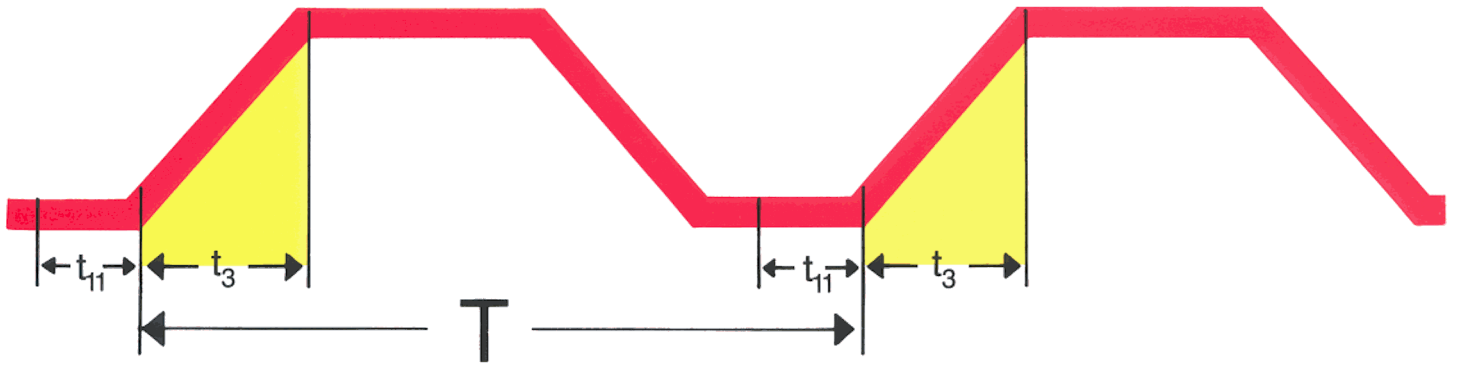
- continuous material feed
- quick length adjustment
- high cycling frequency
- control based on counter



Microprocessor-controlled positioning

- a built-in microprocessor makes it possible to handle difficult control tasks

$$M_{acc} = \frac{I \times \omega}{dt_3}$$

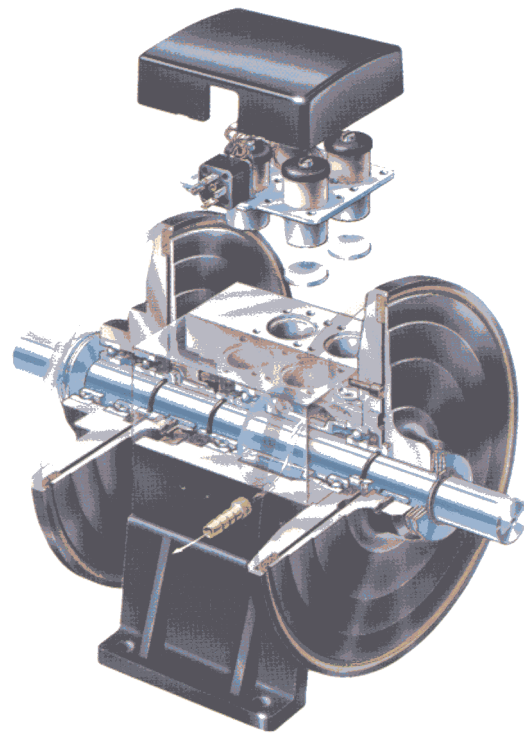
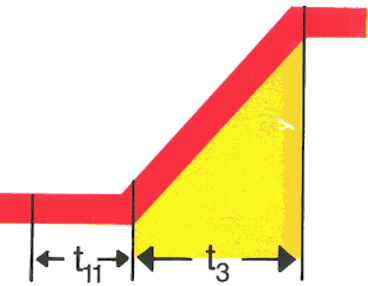


Type	Dyn. torque Nm	Max. rev. min ⁻¹	Max. cycling frequency min ⁻¹	Max. reaction time ms	Obtainable repeat accuracy ms	Shaft diameter mm
SRA 10	5	1700	3600	6	±0,1	15
SRA 15	11	1200	3000	7		25
SRA 18	21	1040	2700	7		25
SRA 20	33	920	2500	8		25
SRA 23	44	800	2100	9		25
SRA 25	57	760	1875	10		25
SRA 30	102	600	1700	11		40
SRA 36	167	500	1600	15		40

SRA 2311	44	800	2100	9	±0,1	25*
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* Hollow shaft
Precision single Clutch Unit SRA 2311 is used in production machinery where clutch function only is required.

Precision Step Units type SRA



Precision Step units type SRA are the mechanical components of the Precision Step System. Mounted between the drive motor and indexed output, the SRA unit will stop and start this output quickly and precisely.

The two fast-working solenoid valves in the step unit are activated by the system electronics. When the solenoid valves are activated, vacuum is generated in the channels leading to the clutch and brake side, respectively. This vacuum sucks the clutch/brake disc against a friction ring, and starts/stops the shaft.

The step unit is supplied with vacuum from a vacuum pump or central vacuum source. The vacuum operating pressure required for all SRA units is 0,7 bar.

Features:

Combine the fast-acting SRA step unit with controls from the flexible SRB range of electronics – and obtain a positioning system which is

- Reliable

A true system approach matching the SRA step unit with one of the specifically engineered electronic controls ensures great precision at high speeds

Short response time makes it possible to achieve high repeat accuracy at the highest speeds

The principle of design guarantees a long operating life

Renovation service means little or no down-time

Protection against electrical noise prevents unintentional start and stop signals

- Maintenance-free

The design principle eliminates the need for maintenance and adjustment

- Designed for the future

Flexible and versatile electronic controls make it possible to offer solutions to customer specific applications

Extensive application know-how guarantees optimum system design

- Economical

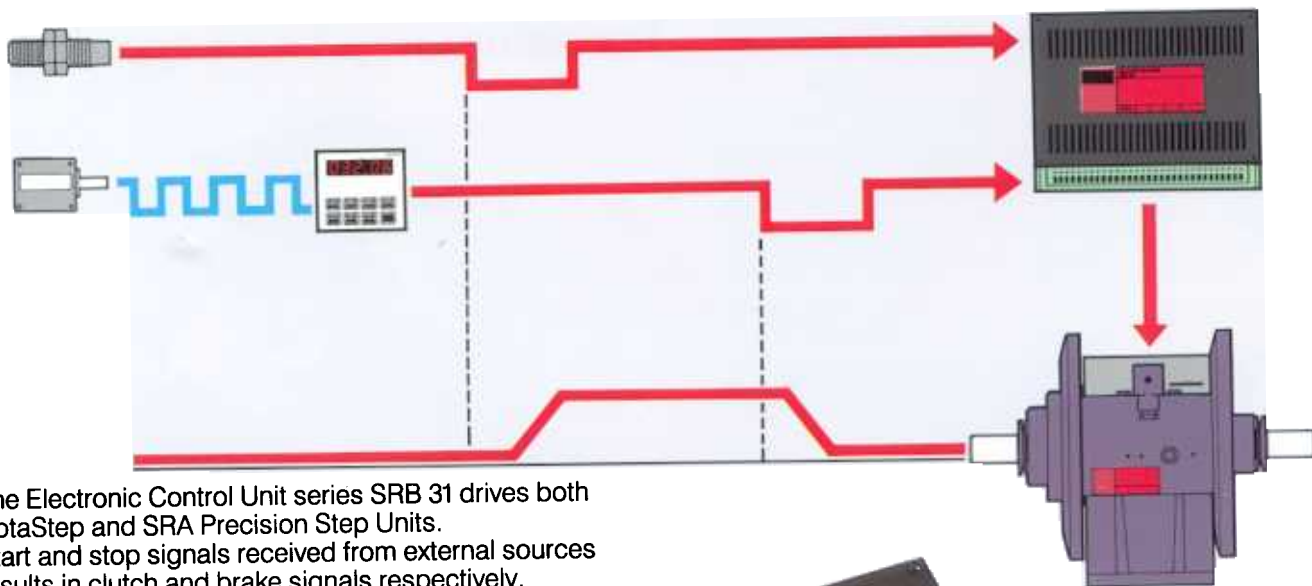
High cycling frequency allows for considerable increase in productivity

High repeat accuracy means savings in material

Fast and easy installation of the product reduces expensive interruptions and keeps down-time to a minimum

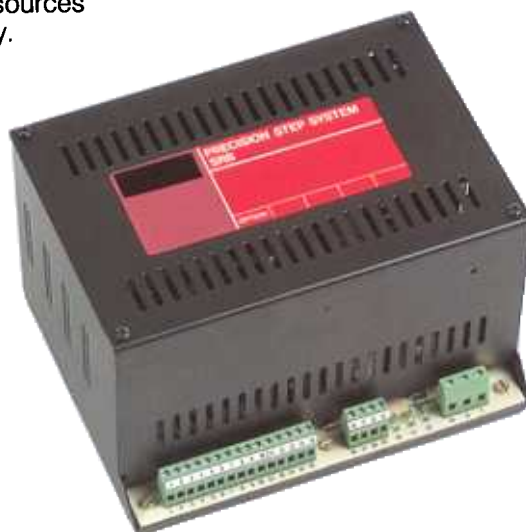
Maintenance-free operation leaves more time for other jobs





The Electronic Control Unit series SRB 31 drives both RotaStep and SRA Precision Step Units. Start and stop signals received from external sources results in clutch and brake signals respectively.

Type	Voltage supply
SRB 3101	24 V a.c. +10/-15%
SRB 3110	100, 115, 200, 220 or 240 V a.c. +10/-15%



Electronic Control Units series SRB 31

The Precision Step Systems comprise a basic program of electronic control units, SRB 31.

The main purpose is to supply the Precision Step Unit with the correct driver signals to ensure fast valve reaction times.

SRB 3110

The option adaptable driver unit for the sophisticated control system. As basic control the features include:

- control from one or two signal sources
- manual/automatic operation
- free mode
- status signals
- 24 V d.c. output

Options obtainable:

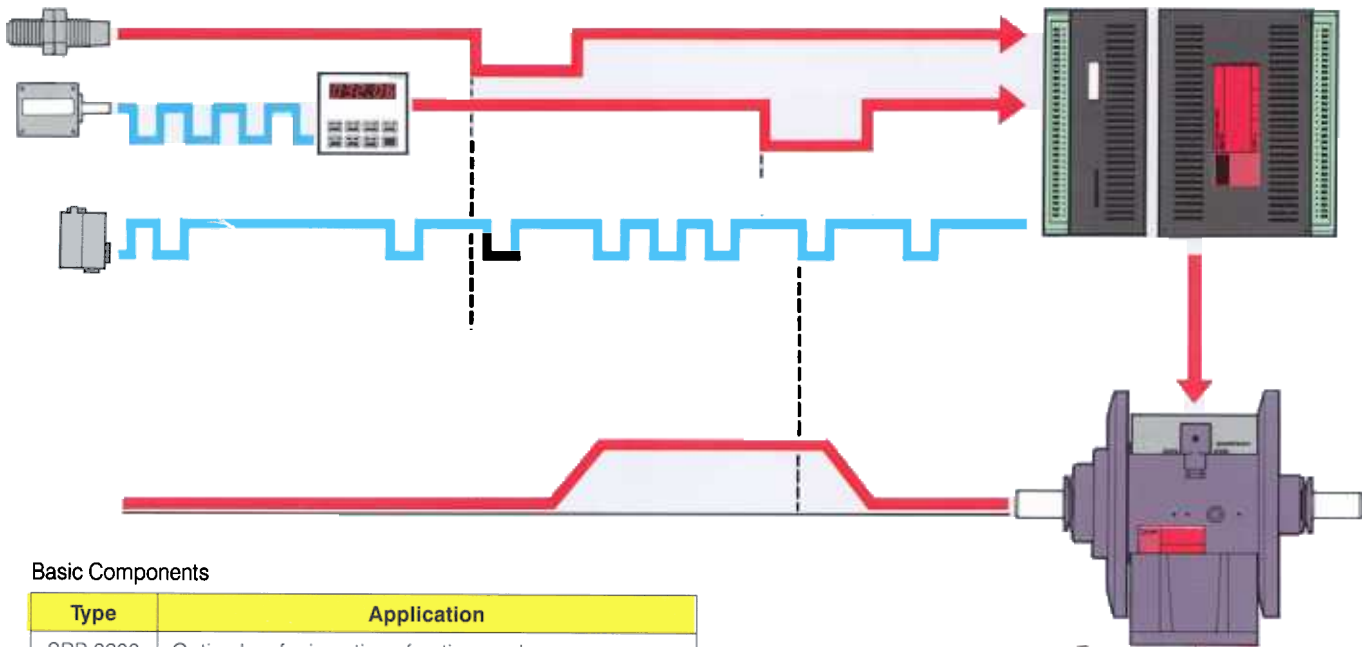
- speed compensation
- overload protection
- counter start and stop functions
- markreader suppression

SRB 3101

The compact driver unit designed for direct control. A wide range of signal sources can be utilized, including PLC control signals.

Features include:

- control from one or two signal sources
- start and stop signal suppression
- free mode
- brake mode
- status signals
- 24 V d.c. output



Basic Components

Type	Application
SRB 3200	Option box for insertion of option cards
SRB 3203	Sinusoidal feeding with zero cross and speed compensation
SRB 3206	Programmable counter for length measurement and speed compensation based on four preset values
SRB 3211	Overload protection for protecting the SRA against mechanical overload (anti-jam)

Option Cards

Type	Application	Function
SRB 3230	Sinusoidal feeding with possibility of mark suppression and stop by pulse counting*	
SRB 3231	Forward and backward feeding	
SRB 3232	Two-speed feeding	
SRB 3233	Feeding with start of cycle by registration mark or pulse counting	
SRB 3234	Feeding with speed-compensated stop of medium by registration mark or pulse counting	

* Used in combination with SRB 3203 only.



Electronic control units series SRB 32

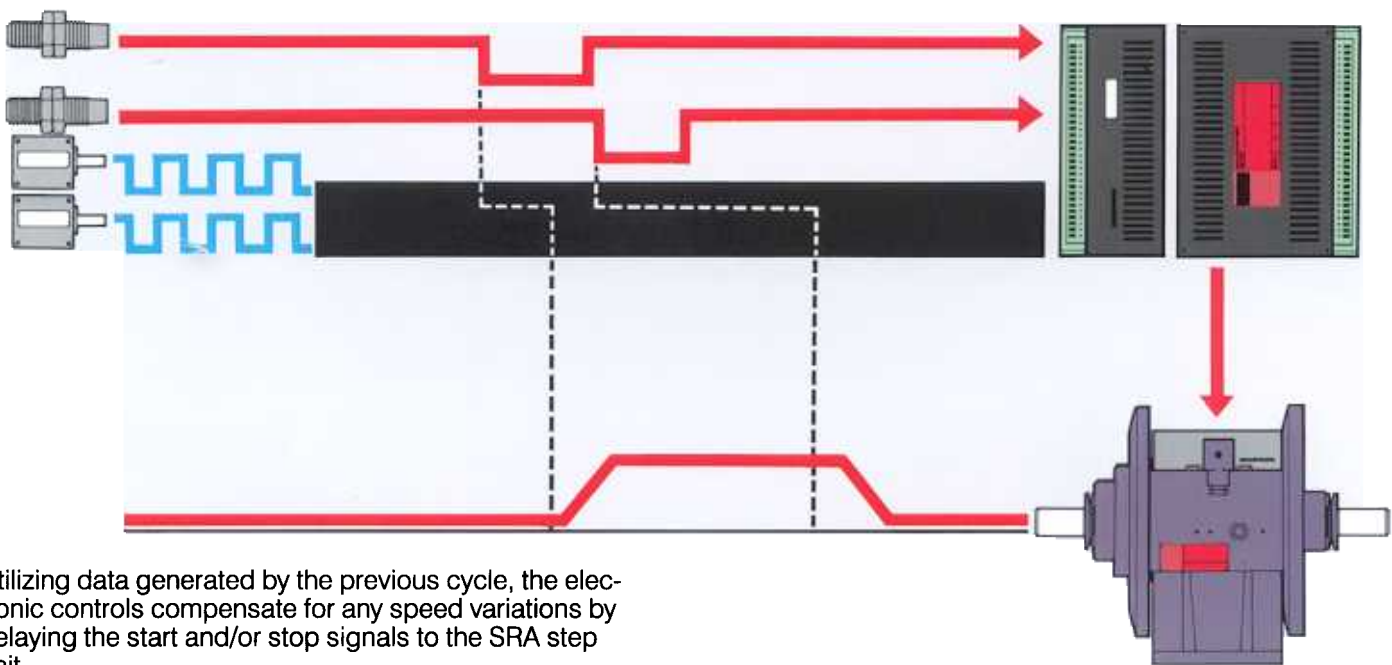
The SRB 32 series is a modular family of electronic controls. The SRB 32 series is used in conjunction with the basic control SRB 3110 for speed-compensated start/stop, etc. where changes in input speed are electronically compensated for and result in a corrected output position.

The SRB 32 family is comprised of a number of basic components typically representing a part of a Precision Step System, as well as a number of PLD based option cards with special functions. By design, customer-specific functions can be created.

* PLD = Programmable Logic Device

Features:

- Flexible range of option cards with PLD functions permits customer-adapted solutions to difficult control problems.
- Precise setting of feeding length in increments as small as 0.001 min allows for start/stop positioning at high speeds.
- Speed compensation ensures precise stop position whatever the speed, thus reducing scrap.
- Electronic protection against mechanical overload prevents expensive down-time and damaged equipment.



Type	Application
SRB 207	6-digit preselector
SRB 3301	Option box for insertion of option cards (CPU), supplied with fixed print card
SRB 3310	Speed-compensated start and stop of medium or speed-compensated stop of medium
SRB 3313	Backfolding (folding of boxes)



Electronic control units series SRB 33

Electronic control units series SRB 33 are a family of electronic controls of modular design. The SRB 33 series has a built-in microprocessor (CPU*) capable of calculating and storing operational parameters.

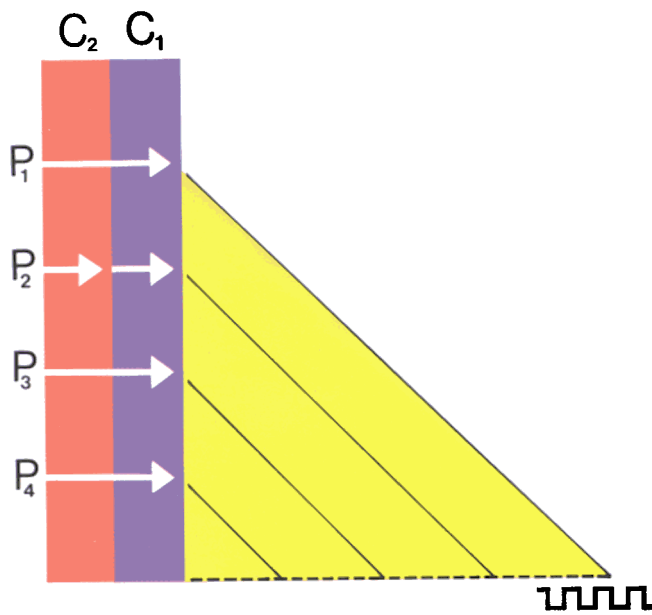
The SRB 33 series is used together with basic control SRB 3110 and option box SRB 3301 for speed-compensated start/stop operations.

The SRB 33 product family is comprised of CPU*-based option cards with unique function capabilities, including those that are customer specific and those that are common to all the cards in the family.

*CPU = Central Processing Unit

Features:

- Flexibility in programming of the CPU-based option cards allows for customer-adapted function capability utilizing the micro-processor's calculation and memory functions
- Speed compensation ensures precise stop position whatever the speed, thus reducing scrap
- Electronic protection against mechanical overload prevents expensive down-time and damaged equipment



Preselect value "x"

Type	Number of digits	Counting range	Counting freq. max.	Supply voltage
SRB 3206	5	0-999.99 0-99.999	50 kHz	24 V d.c. ± 6 V

Electronic control unit Preset counter type SRB 3206

The electronic preset counter type SRB 3206 is ideal for use in processes where precise length measurement, high counting frequency and rapid changeover are required.

The preset value of a desired feeding length or other physical quantity is programmed into the preset counter. Four different preset values are available and may be programmed in any desired unit of measurement i.e. mm, inches, degrees, kg, r.p.m., etc.

After initial programming you can quickly and easily change the preset value and in this way modify the product even on the fly.

Two discrete counter sections internal to the SRB 3206 further increase the functional flexibility. These counters will operate at high frequency to ensure that no pulses are lost during the start/stop phases.

The preset counter SRB 3206 offers the following functions:

- Two discrete counter sections
- Programming of four preset values
- Shift of preset values during operation
- Programming of scale factor
- Choice of digit range (movement of decimal point)
- Selecting one or two-channel encoders
- Selecting preset conditions
- Selecting counting direction (up or down)
- Counter blocking

Features:

- Counting frequency of up to 50 kHz ensures high precision
- Very short reset times eliminate counting errors
- Optional scale factor ensures great flexibility

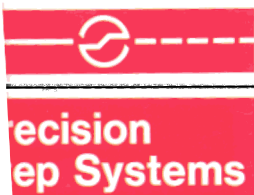
Precision Step Systems

Start/stop systems for any positioning need

In addition to the SRA step unit Precision Step Systems also offers the clutch brake RotaStep – driven by compressed air. Furthermore, Precision Step Systems offers a wide range of accessories such as vacuum pumps, encoders, photo cells and positioning discs.



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