Precision
Step Systems

Driver Unit type SRB 3102

Data sheet 2-1998

Description

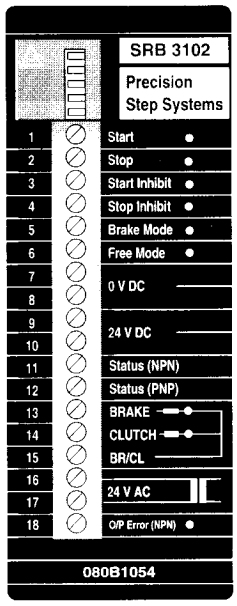


Fig.1

The SRB 3102 driver unit is designed for driving the *Rotastep, Rotastep II* clutch/brake unit or the SRA Precision Step Unit of the Laurence, Scott & Electromotors Ltd. Precision Step System.

SRB 3102 features include:
- Start and stop signal suppression
- PLC interfacing facilities
- Programmable signal inputs: edge sensitivity, NPN/PNP signal types
- Free mode
- 24V d.c. output
- Output error signal

The SRB 3102 driver unit can be used in conjunction with *Rotastep, Rotastep II* or SRA for a wide range of applications, primarily where starting and stopping are controlled by sensor signals.

The SRB 3102 has facilities for interaction with other control units, for example PLCs.

Input terminals

By activating the following terminals, the functions described below can be obtained:

Terminal		Functions
1	*Start*	Activates the clutch valve driver output
2	*Stop*	Activates the brake valve driver output
3	*Start inhibit*	Suppresses the start signal
4	*Stop inhibit*	Suppresses the stop signal
5	*Brake mode*	Sets the *Rotastep*/SRA /*Rotastep II* unit in brake mode
6	*Free mode*	Inhibits driver signals and enables the output shaft to rotate freely

Note: Earth connection to housing.

Output terminals

Terminal		Functions
7-8	*0 V d.c.*	0 V d.c. reference. **Do not connect to earth!**
9-10	*24 V d.c.*	Stabilized 24 V d.c. output, max. load 300 mA
11	*Status (NPN)*	NPN open collector output. On (0 V) when SRB 3102 is in Clutch mode
12	*Status (PNP)*	PNP open collector output. On (24 V) when SRB 3102 is in Clutch mode
13	*BRAKE*	Driver output for brake solenoid valve
14	*CLUTCH*	Driver output for clutch solenoid valve
15	*BR/CL*	Connection to the common point of the solenoid valves. **Do not connect to 0 V d.c. or earth!**
16-17	*24 V a.c.*	Power supply. See technical data page 6
18	*O/P ERROR (NPN)*	NPN open collector output. On (0v) when SRB-3102 detects a short circuit.

Note

The SRB-3102 can replace an existing SRB-3101 by plugging the 17 pin connector into the upper pins 1-17 of the SRB-3102.
To prevent incorrect connection, terminal 18 is guarded. For use with an 18 pin connector on new applications, the guard should be removed.

Indicators

The LEDs at the following terminals indicate that the input or output is active:

LED
Start)*
Stop)*
Start inhibit
Stop inhibit
Brake mode
Free mode
*Output error**)*
BRAKE
CLUTCH

*) If inputs are set to PNP neg. edge or NPN pos. edge, LED lights up when terminals are inactive.

**) *Output Error* LED lights up if a short-circuit has been detected at any output terminal. Check all output connections for short-circuits. Turn off power (min. 15 s) to reset. Solenoid valve coil resistance must be as listed below:

Rotastep 06, 08, 10, 12 *Rotastep* 1A, 1B, 2A, 2B	9.5 Ω to 16 Ω
Rotastep 15 and SRA 10 *Rotastep* 3A, 3B	8.5 Ω to 12 Ω
SRA 15 to 36	4.2 Ω to 6 Ω

The resistance depends on coil temperature

Function description

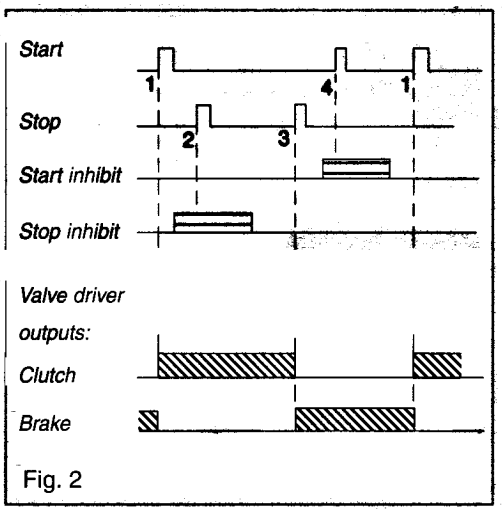


Fig. 2

Start inhibit/Stop inhibit

1. A signal supplied at the *Start* input turns the *Clutch* output on.
2. When *Stop inhibit* is active, signals supplied at the Stop input are ignored.
3. A signal supplied at the *Stop* input turns the Brake output on, and the *Clutch* output off.
4. Start signals are ignored as long as *Start inhibit* is active.

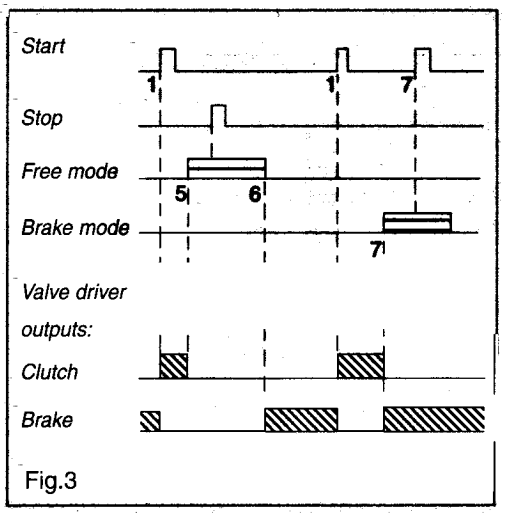


Fig.3

Free mode/Brake mode

5. Activation of *Free mode* turns both valve driver outputs off. The output shaft of the *RotaStep*/SRA unit can then rotate freely.
6. When *Free mode* is deactivated, the condition of the valve driver outputs is determined by the latest activated input mode. In this example, the *Stop* input was activated during the *Free mode* period. Consequently, the *Brake* output is turned on.
7. Activation of *Brake mode* turns on the *Brake* output, and start signals are ignored. Only *Free mode* overrides *Brake mode.*

Valve driver output

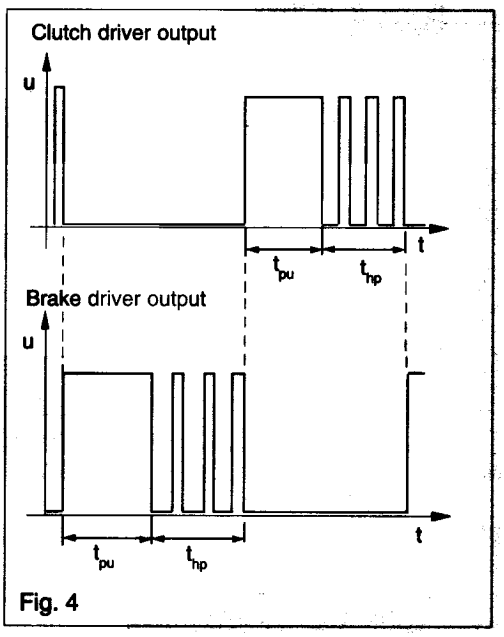
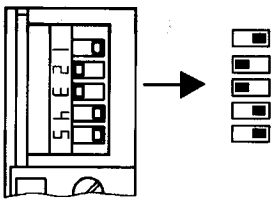


Fig. 4

The solenoid valve driver signal consists of a pick-up pulse t_{pu} and a holding period t_{hp}. The pick-up pulse ensures fast activation of the solenoid valves.
The duration of the holding period is depending on the cycling frequency of the *Rotastep*/SRA/Rotastep II. During the holding period, the valve output voltage is chopped to decrease the current. This minimizes heat dissipation in the solenoid coils and ensures fast release of the solenoid valve.

The output signals to the two solenoid valves interact as indicated in fig. 4.



Warning!
Do not change the setting of DIP switches when power is on.

Changes of the setting can cause un-intended start of the *Rotastep*/SRA/ *Rotastep* II unit.

Fig. 5

By means of the DIP switches on the front of the SRB 3102 it is possible to set the input terminals to accept signals from a wide range of signal sources.

Start terminal signal source type PNP or NPN is set by DIP 1.

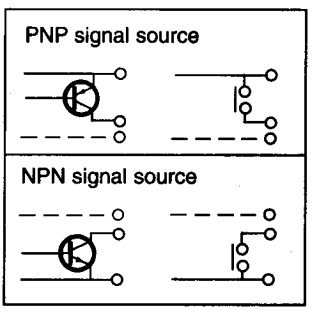
Start terminal edge sensitivity is set by DIP 2.

Stop terminal signal source type PNP or NPN is set by DIP 3.

Stop terminal edge sensitivity is set by DIP 4.

Input terminals 3 to 6 are set to PNP or NPN signal sources by DIP 5.

The setting of DIP switches appears from the below table.



Signal source:			PNP	NPN
Setting *Start* terminal	Edge sensitivity	pos.	DIP 1 DIP 2	DIP 1 DIP 2
		neg.	DIP 1 DIP 2	DIP 1 DIP 2
Setting *Stop* terminal	Edge sensitivity	pos.	DIP 3 DIP 4	DIP 3 DIP 4
		neg.	DIP 3 DIP 4	DIP 3 DIP 4
Setting *Start* and *Stop* when using single signal source	Wiring	1 2	DIP 1 DIP 2 DIP 3 DIP 4	DIP 1 DIP 2 DIP 3 DIP 4
Setting terminal 3-6			DIP 5	DIP 5

Application examples

Stop by counter

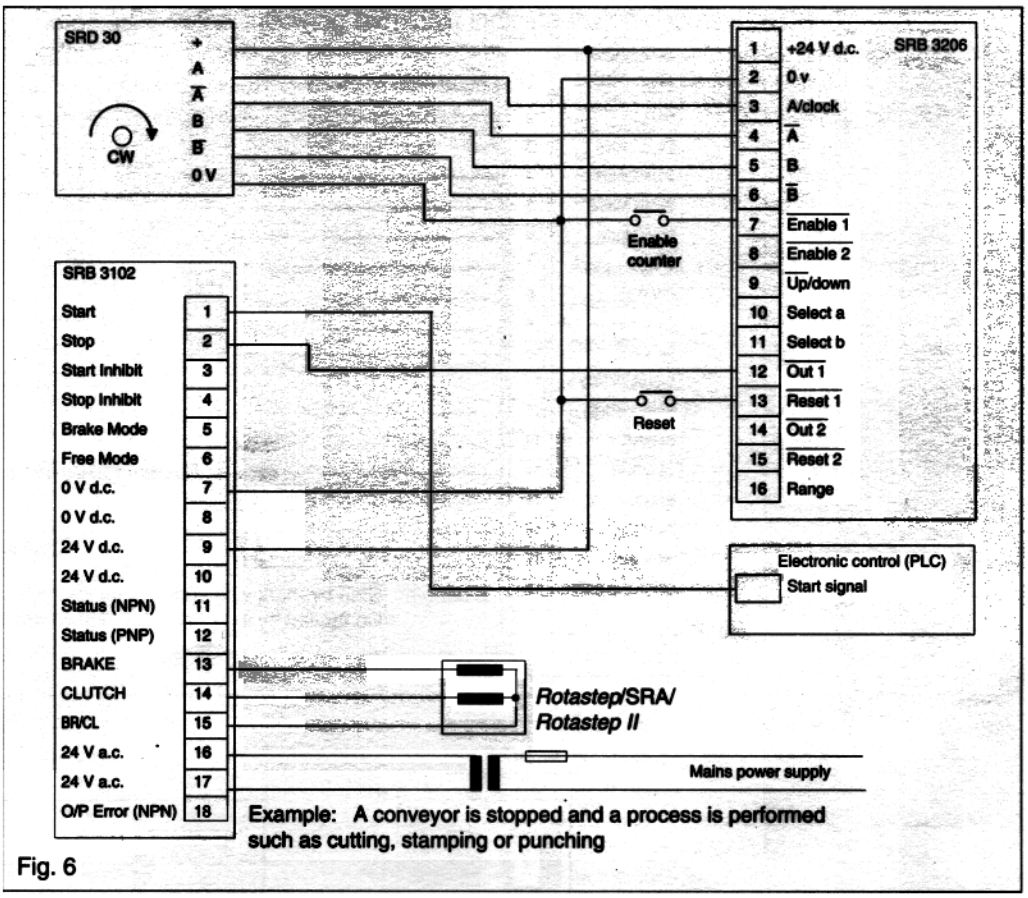


Fig. 6

Start by counter

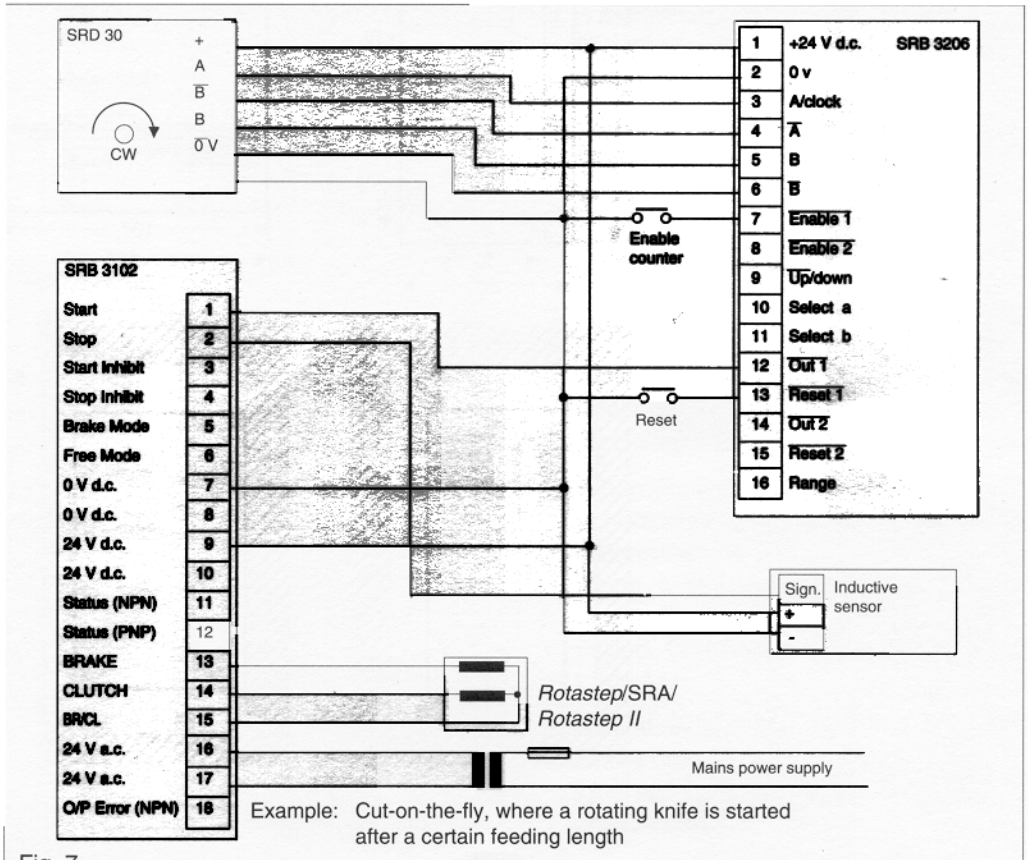
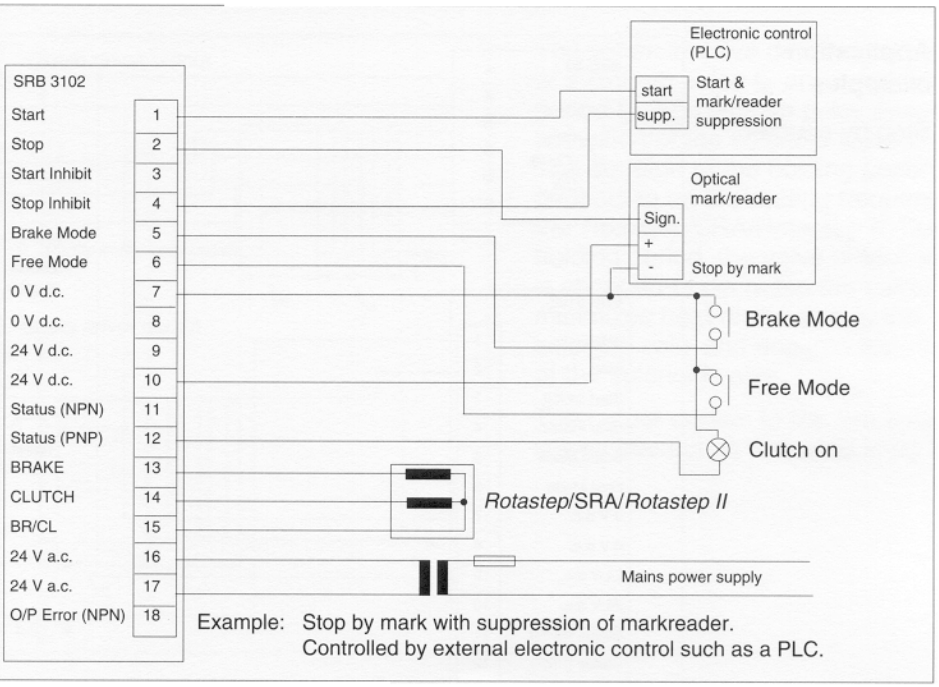


Fig. 7

Stop by mark



Example: Stop by mark with suppression of markreader.
Controlled by external electronic control such as a PLC.

Fig. 8

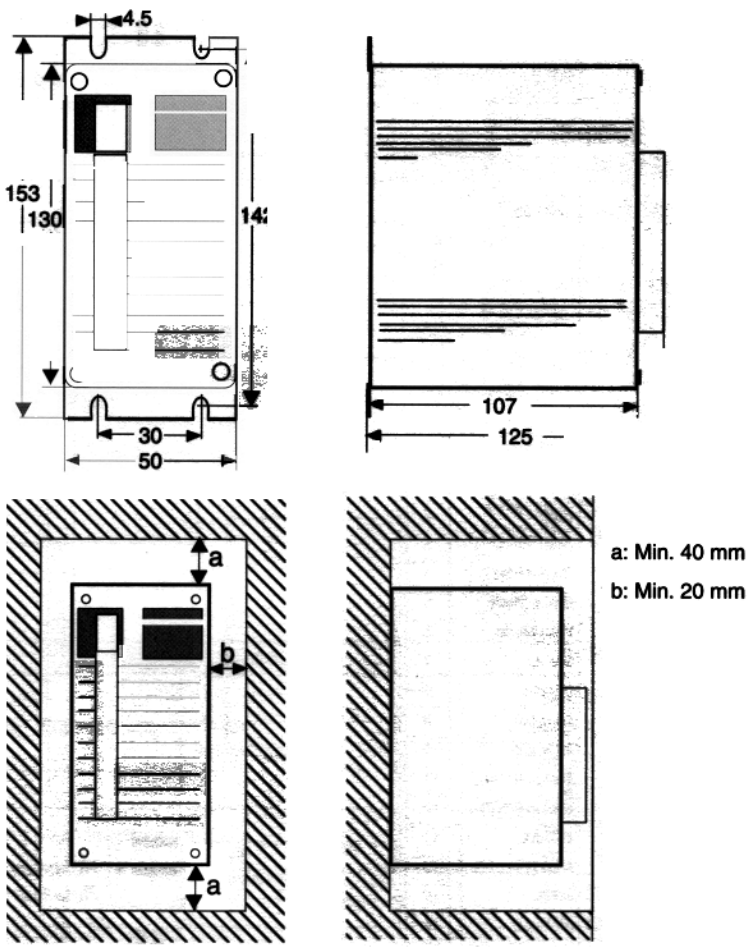


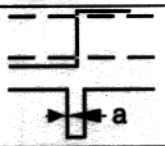
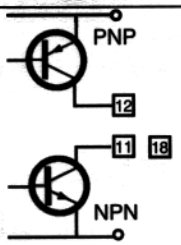
Fig. 9

Data sheet — Driver Unit type SRB 3102

Ordering

Type	Code no.
SRB 3102	080B1054

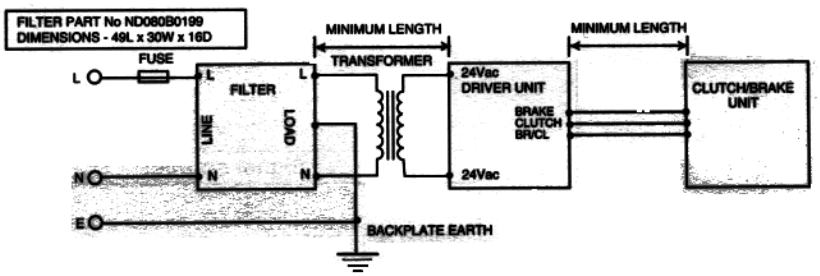
Technical data

Valve driver output	Drives:	*Rotastep* 06-15 *Rotastep II* 1A-3B SRA 10-36
	Cycling frequency:	SRA 10 max. 30 Hz SRA 15-36 max. 20 Hz *Rotastep* max. 20 Hz at 40°C ambient temperature
	Cables:	Min. 0.5 mm², max 0.25 Ω per lead
Input signals		U_{high} > 16 V. Max. 30 V U_{low} < 2 V. min. 0 V a: Min. 0.7 ms Earth connection to housing, see fig. 9
Output status signals		U_{high} / Vcc-2 V. 1 max 100 mA I_{leak} / 1 mA U_{low} / 2 V, 1 max 100 mA I_{leak} / 1 mA
Voltage output		24 V d.c. ±1 V stabilized (at nominal supply). Max. total current load: 300 mA
Voltage supply		24 V a.c. +10%, -15%, 50-60 Hz. Transformer max. 75 VA **DO NOT EARTH WITH OV**
Power consumption		Max. 40 W
E.M.C.		In Accordance with 89/336/EEC, amended by 92/31/EEC with associated filter part Code ND080B0199
Humidity - static - cyclic		 In accordance with IEC 68-2-3 Ca In accordance with IEC 68-2-3-30 Db
Ambient temperature	During operation: Storage:	0 to 40°C 0 to 50°C when 24 V d.c. is not used -40 to 70°C
Weight		0.43 kg
Dimensions		153 x 50 x 125 mm
Enclosure		Anodized aluminium housing, IP20

Cycling frequency	Transformer
1 Hz	> 20 VA
5-10 Hz	> 25 VA
15 Hz	> 30 VA
20 Hz	> 35 VA

EMC Filter Installation Instrutions

PSS Installation Recommendations for EMC
In order to meet the EEC Directive for EMC, the equipment should be installed as shown using the recommended filter.
1) Mains and output cables should not be run together.
2) Control cables should be separated from output cables.
3) Control cables should be screened.
4) SRB-3102 Driver Case should be earthed.



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