Table Of Contents

Quick Start Guide
SV3000 APPLICATION

1. <u>**Torque Helper**</u>

1.1 Introduction

Two SV3000, one used as a speed drive and the other as torque drive.

Speed Drive   Torque Drive
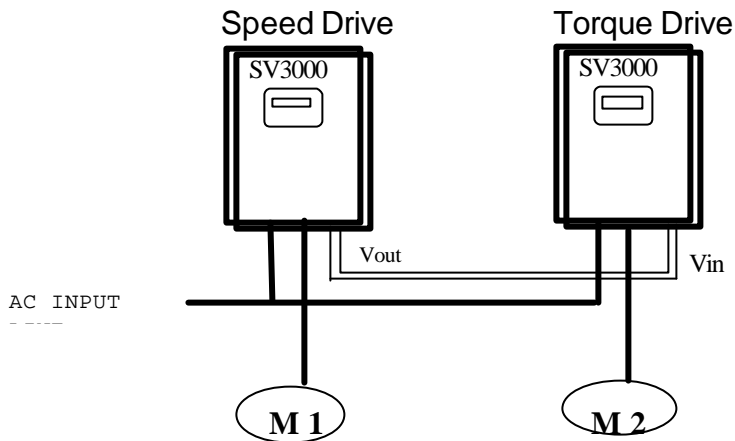
1.2 Features

The speed drive can be operated via KEYPAD, SPEED POT, or analog input signal (0-10V, 0-20mA, or 4-20mA) and the torque drive

1.3 Safety and Installation:

Installation instructions are specified in Section 2 of SV3000 manual.

BEFORE APPLYING POWER, VERIFY THAT THE PROPER VOLTAGE IS AVAILABLE FOR THE INVERTER. FAILURE TO DO THIS CAN RESULT IN EQUIPMENT DAMAGE AND PERSONAL INJURY.

Application of Torque Helper

Here is the overall view of the control terminal connections for the SV3000, for more information about the control terminal locations and definitions refer to **section 2.12** of the SV3000 manual.

SV3000 TERMINALS LOCATION DIAGRAM

SERIAL COMM TYPE 4B5
J1

SYNC. COMM. OUT
J2-A

SYNC. COMM IN
J2-B

DIGITAL I/O
CLOSE TO ACTIVATE (XXX)
OPEN TO ACTIVATE (XXX)

ANALOG I/O
INPUTS OUTPUTS

RELAY OUTPUTS
USER   READY

SERIAL
COMM TERM.

TX+ TX- RX- RX+ USER NO USER NC USER COM RDY NO. RDY COM USER DC OUT. LOGIC COMMON EXTERNAL TRIP FAULT RESET USER PROGRAM N JOG SPEED 3 SPEED 2 SPEED 1 FWD/REV LOCAL/REMOTE LOGIC COMMON STOP START

TB1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

+24 SUPPLY (10MA) LOCAL V. IN USER PROG. V. IN REMOTE I LOOP + REMOTE I LOOP - SIGNAL COMMON + 1 DVDC (5MA) - 1DVDC (5MA) LOCAL V OUT (5MA) USER/PROG.V-OUT(5MA)

TB2
1 2 3 4 5 6 7 8 9 10

GRD X1 DBR - + X2

T1 T2 T3
AC MOTOR 3 PHASE CONN.

GROUND, SHIELD.

AC 3 PHASE LINE CONNECTION
L1
L2
L3
REPLACE FUSES WITH BUSS TYPE KTK OR EQUIVALENT

2 TERMINAL CONNECTIONS AND PARAMETER SETUP OPERATED WITH KEYPAD CONTROL

Connect the speed and torque drives together as shown in Figure 2.2.1a or 2.2.1b. Next you should tune each drive following the procedure in **Section 3.8-3.9** of SV3000 manual. After the tuning process is completed, the parameters of the speed and torque drive can be setup as follows:

2.1 Setup for speed drive

After this drive has been tuned, go to menu **P2XX** and **P4XX**
Set **P201**, "RUN MODE" to **M SPEED**
Set **P203,** "Setpoint Source" to **KEYPAD**
Set **P420, "**LOCAL Vout" to **TORQ**

2.2 Setup for torque drive

After this drive has been tuned, go to menu **P2XX** , **P3XX** and **P4XX**.
Set **P20**1, "Run Mode" to **TORQ**
Set **P203, "**Setpoint Source" to **ANALOG**
Set **P311**, "Torque Source" to **EXT**

2.2.1 Torque drive can be set to ratio 1 to 1 or adjusted to % of the speed drive

2.2.1a Adjust torque ratio 1 to 1 or some % of speed drive
? If you want the torque drive to follow the speed drive at ratio of 1 to 1 then set **P312** to 100%
? If you want the torque drive to follow from 70 to 90% torque of speed drive then set **P312**, "Internal Torque" to **70% or 90%**.

2.2.1b Adjust torque ratio externally with trim pot
? If you want to adjust the output torque externally than set **P312**, "Internal" Torque" to **100%** and connect a 5K trim pot as shown figure 2.2.1b.

SPEED DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

STOP **START**

TORQUE DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
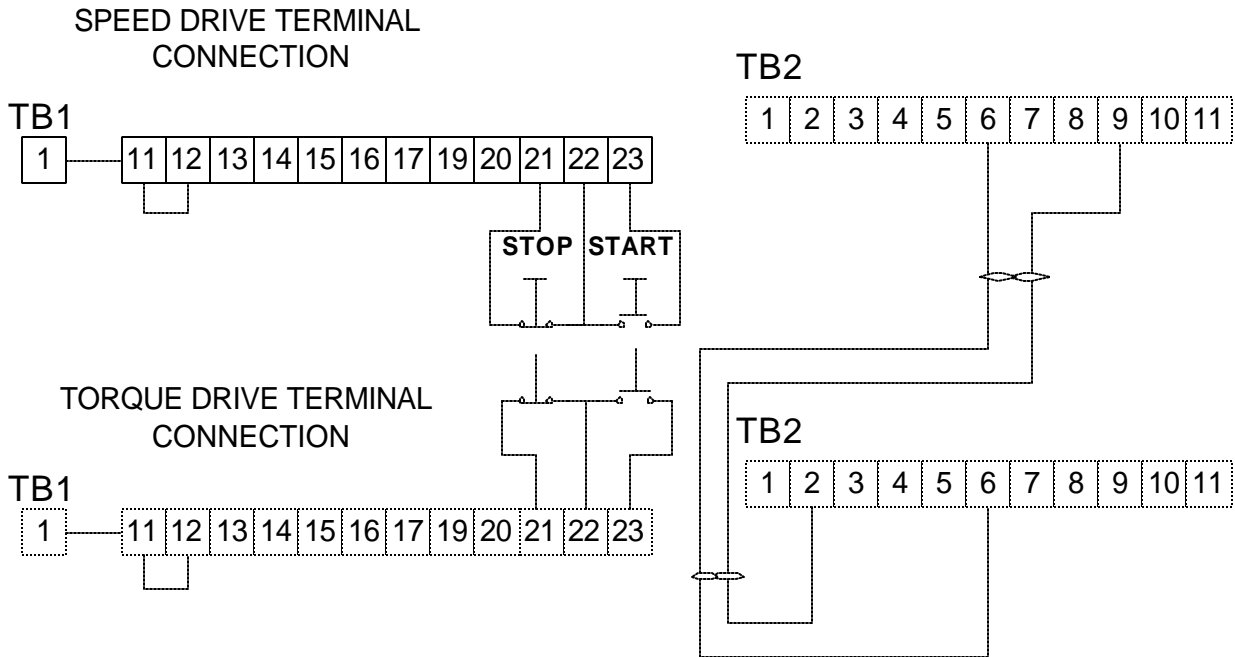
Figure 2.2.1a. Terminals connection operate with KEYPAD for section 2.2.1a

SPEED DRIVE TERMINAL CONNECTION

TB1

TORQUE DRIVE TERMINAL CONNECTION

TB1

TB2
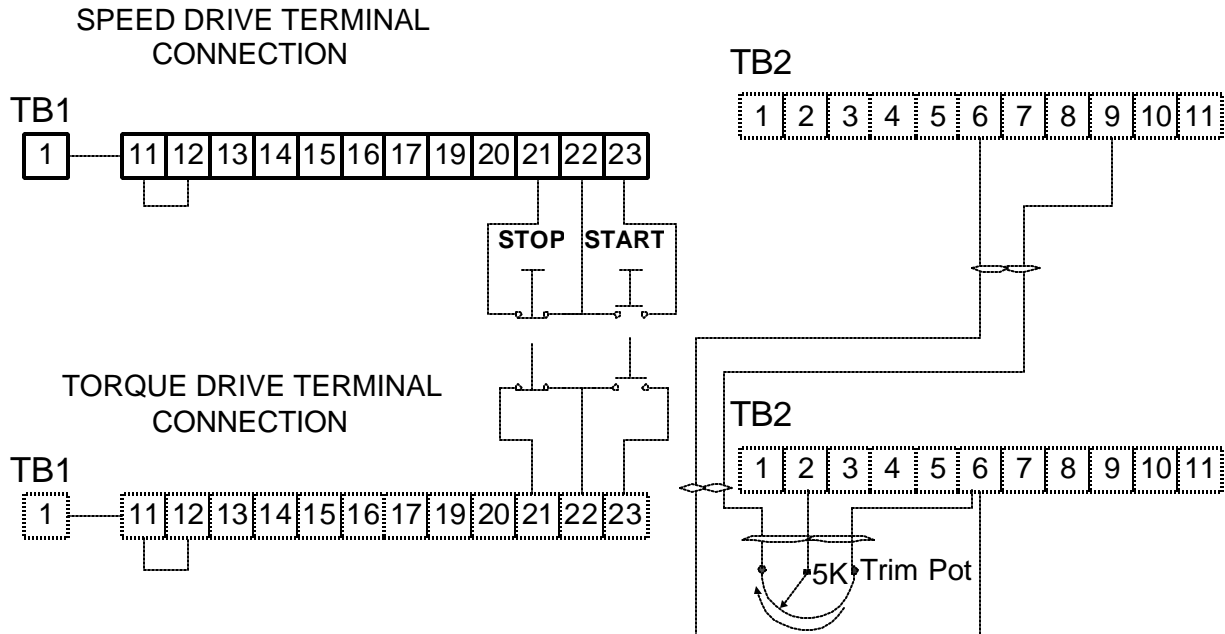
STOP START

5K Trim Pot

Figure 2.2.1b. Terminals connection operate with KEYPAD for section 2.2.1b

3 TERMINAL CONNECTIONS AND PARAMETER SETUP OPERATED WITH SPEED POT

To control the speed drive with the speed pot, wire the terminals as shown in Figure 3.2.1a or 3.2.1b. The parameters of speed and torque drives need to be set as follows:

3.1 Setup for speed drive

After this drive has been tuned, go to menu **P2XX** and **P4XX**.

Set **P201,** "Run Mode" to **M SPEED**

Set **P203,** "Setpoint Source" to **ANALOG**

set **P420,** "LOCAL Vout" to **TORQ**

3.2 Setup for torque drive

After this drive has been tuned, go to menu **P2XX** , **P3XX** and **P4XX**.

Set **P20**1, "Run Mode" to **TORQ**

Set **P203,** "Setpoint Source" to **ANALOG**

Set **P311**, "Torque Source" to **EXT**

3.2.1 Torque drive can be set to ratio 1 to 1 or adjusted to % of the speed drive

3.2.1a Adjust torque ratio 1 to 1 or some % of speed drive
? If you want the torque drive to follow the speed drive at ratio of 1 to 1 then set P312 to 100%
? If you want the torque drive to follow from 70 to 90% torque of speed drive then set **P312**, "Internal Torque" to **70% or 90%**.

3.2.1b Adjust torque ratio externally with trim pot
? If you want to adjust the output torque externally than set **P312**, "Internal" Torque" to **100%** and connect a 5K trim pot as shown figure 3.2.1b.
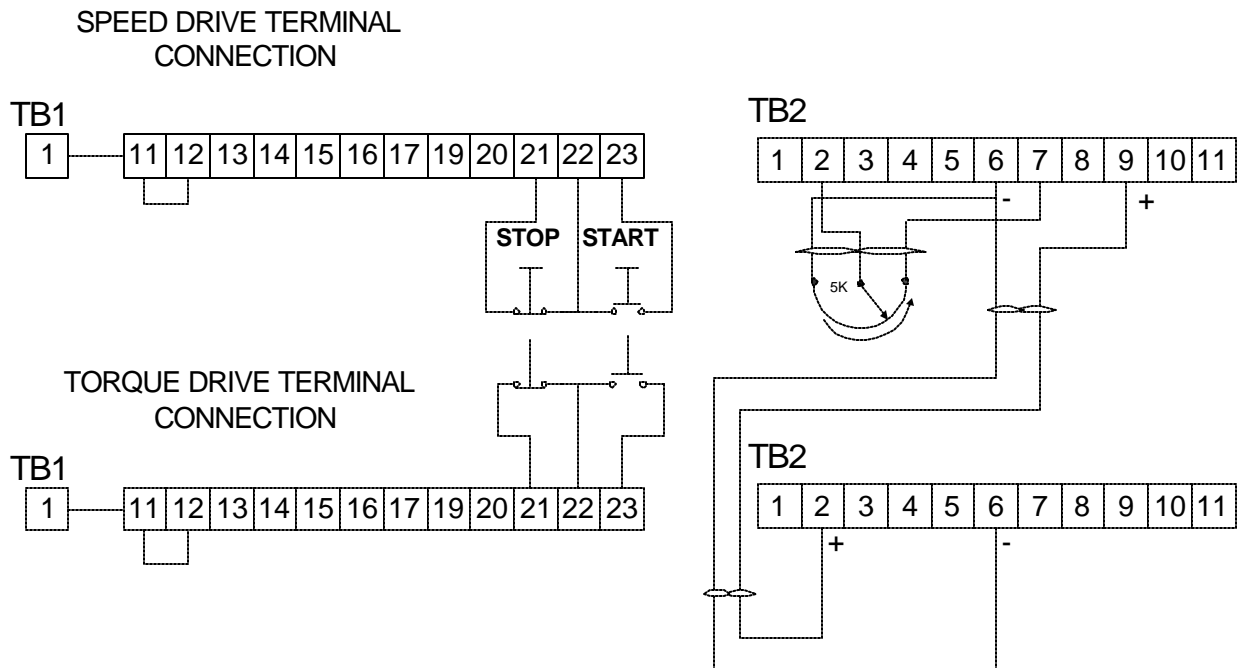
SPEED DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

STOP   START

5K

TORQUE DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

Figure 3.2.1a. Terminals Connection using SPEED POT for section 3.2.1a

SPEED DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

STOP   START

- +

5K

TORQUE DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

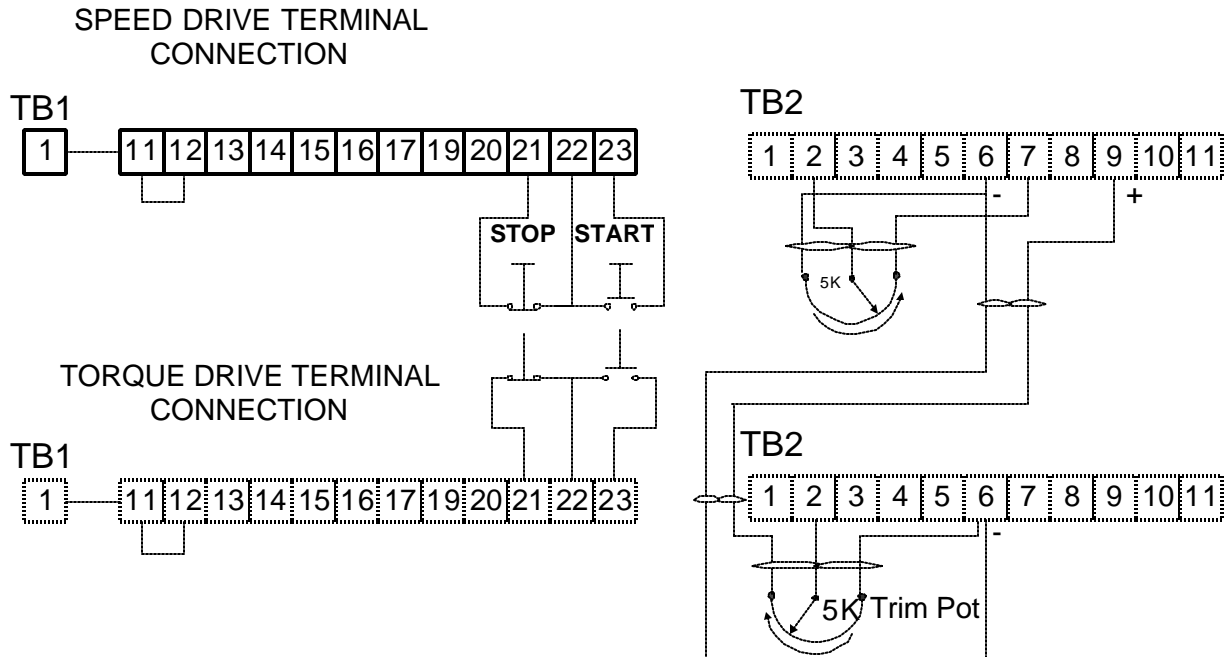| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

-

5K Trim Pot

Figure 3.2.1b. Terminals Connection using SPEED POT for section 3.2.1b

4. TERMINAL CONNECTIONS AND PARAMETER SETUP OPERATED WITH LINE SPEED (0-10V)

To set the speed using a 0-10V signal, wire terminals as shown in Figure 4.2.1a or 4.21b. The parameters of speed and torque drive should be as follows:

4.1 Setup for speed drive

After this drive has been tuned, go to menu **P2XX** and **P4XX**.
Set **P201,** "Run Mode" to **M SPEED**
Set **P203,** "Setpoint Source" to **ANALOG**
Set **P420,** "Local Vout" to **TORQ**

4.2 Setup for torque drive

After this drive has been tuned, go to menu **P2XX** , **P3XX** and **P4XX**.
Set **P20**1, "Run Mode" to **TORQ**
Set **P203,** "Setpoint Source" to **ANALOG**
Set **P311**, "Torque Source" to **EXT**

4.2.1 Torque drive can be set to ratio 1 to 1 or adjusted to % of the speed drive

4.2.1a Adjust torque ratio 1 to 1 or some % of speed drive

? If you want the torque drive to follow the speed drive at ratio of 1 to 1 then set P312 to 100%

? If you want the torque drive to follow from 70 to 90% torque of speed drive then set **P312**, "Internal Torque" to **70% or 90%**.

4.2.1b Adjust torque ratio externally with trim pot

? If you want to adjust the output torque externally than set **P312**, "Internal" Torque" to **100%** and connect a 5K trim pot as shown figure 4.2.1b.
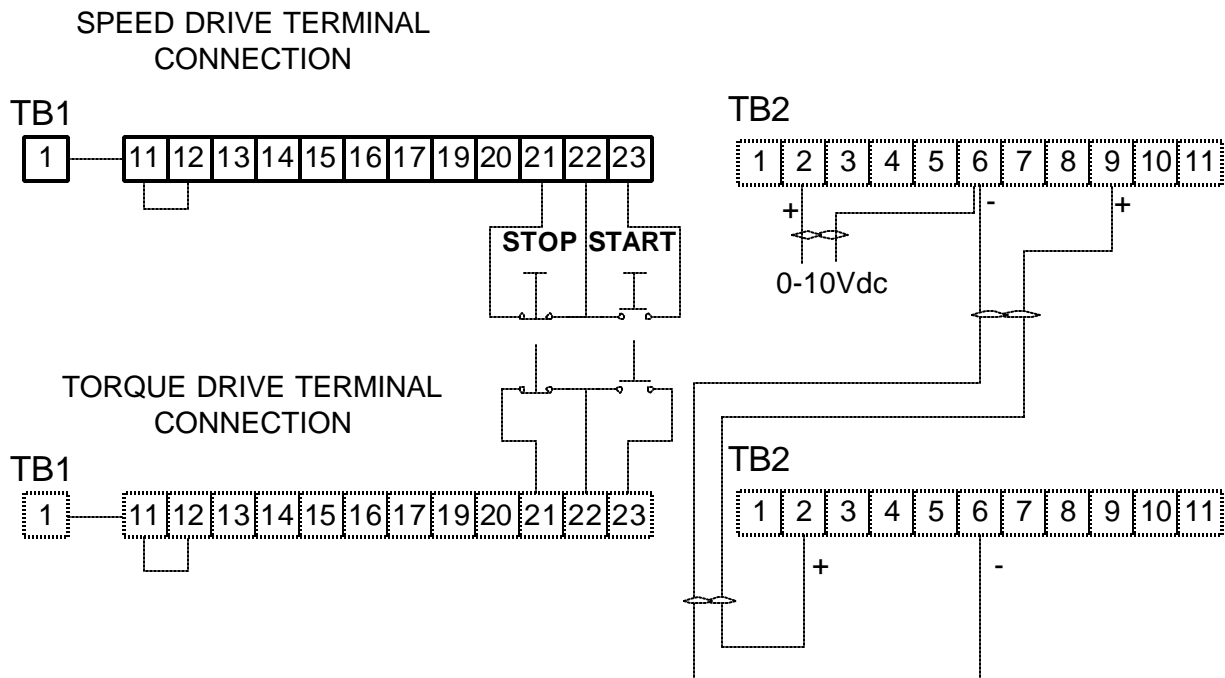

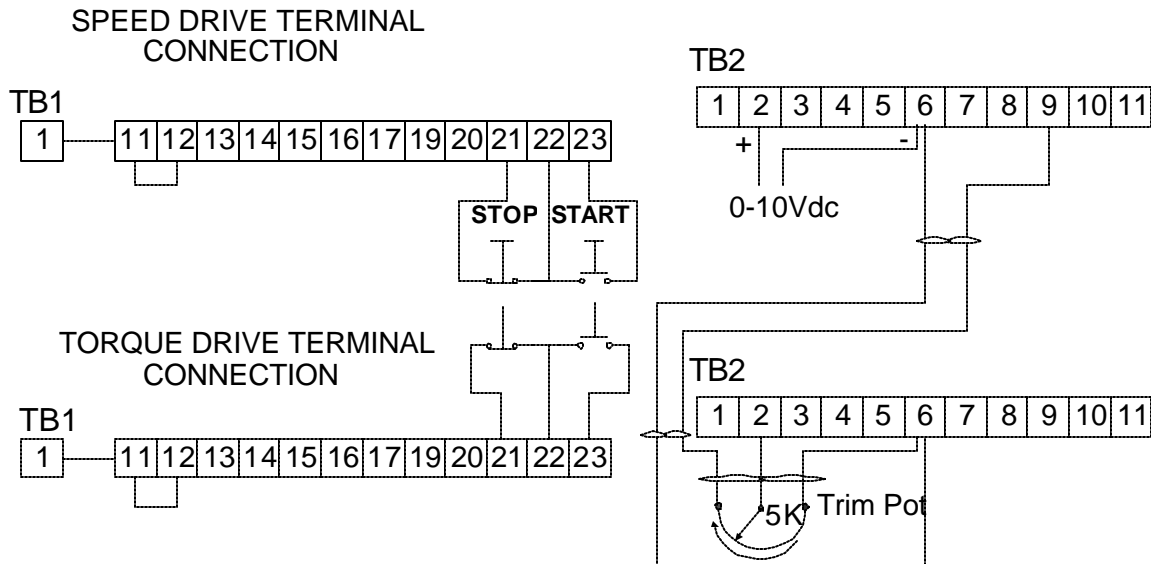**Figure 4.2.1a**. Terminals connection using 0-10V for section 4.2.1a

Figure 4.2.1b. Terminals connection using 0-10V for section 4.2.1b

5. TERMINAL CONNECTIONS AND PARAMETER SETUP OPERATED WITH LINE SPEED USING 0-20mA or 4-20mA.

To set the speed using 0-20 mA or 4-20 mA signal, then wire terminals as shown in Figure 5.2.1a or 5.2.1b. The parameters of speed and torque drives need to be set as follows .

5.1 Setup for speed drive

After this drive has been tuned, go to menu **P2XX P4XX**.
Set **P201, "**Run Mode" to **M SPEED**
Set **P203, "**Setpoint Source" to **ANALOG**
Set **P410**, "R Offset" to **NOM0-20**, if using 0-20mA input.
Set **P410**, "R Offset" to **NOM4-20**, if using 4-20mA input
Set **P420, "**Local Vout" to **TORQ**

5.2 Setup for torque drive

After this drive has been tuned, go to menu **P2XX** , **P3XX** and **P4XX**.
Set **P20**1, "Run Mode" to **TORQ**
Set **P203, "**Setpoint Source" to **ANALOG**
Set **P311**, "Torque Source" to **EXT**

5.2.1 Torque drive can be set to ratio 1 to 1 or adjusted to % of the speed drive

5.2.1a Adjust torque ratio 1 to 1 or some % of speed drive

? If you want the torque drive to follow the speed drive at ratio of 1 to 1 then set P312 to 100%
? If you want the torque drive to follow from 70 to 90% torque of speed drive then set **P312**, "Internal Torque" to **70% or 90%**.

5.2.1b Adjust torque ratio externally with trim pot

? If you want to adjust the output torque externally than set **P312**, "Internal" Torque" to **100%** and connect a 5K trim pot as shown figure 5.2.1b.
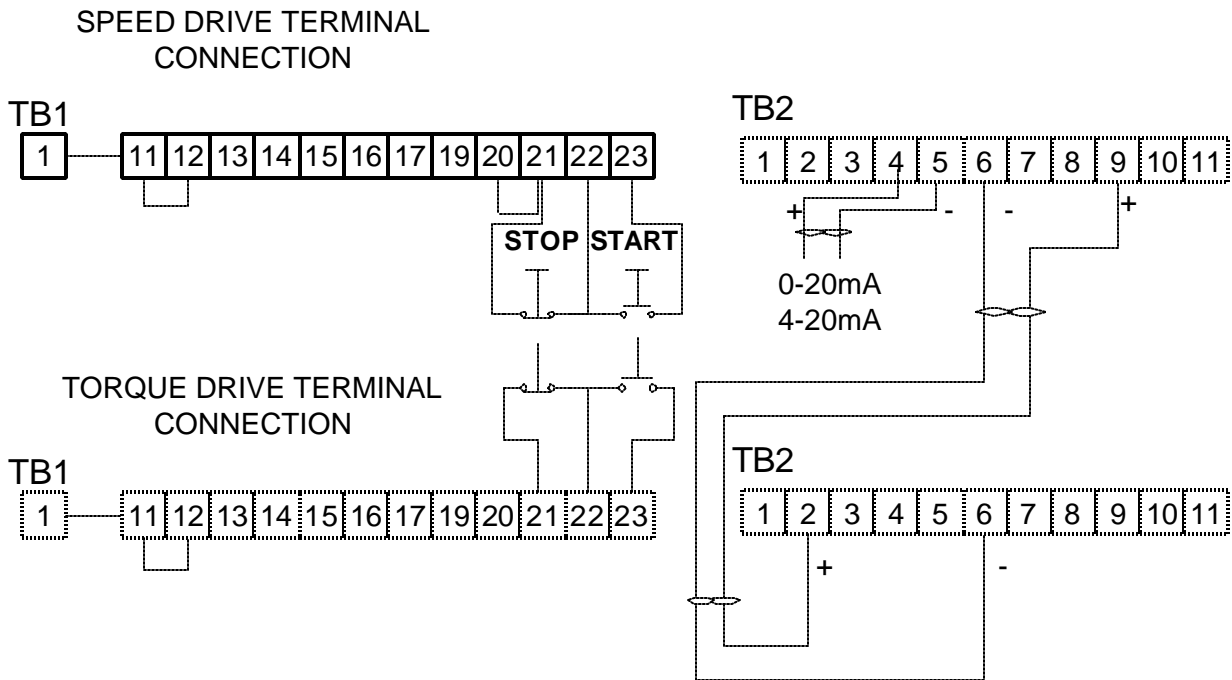

Figure 5.2.1a. Terminals Connection using 0-20mA or 4-20mA for section 5.2.1a

SPEED DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

+   -   -   +

STOP **START**

0-20mA
4-20mA

TORQUE DRIVE TERMINAL
CONNECTION

TB1

| 1 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |

TB2

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

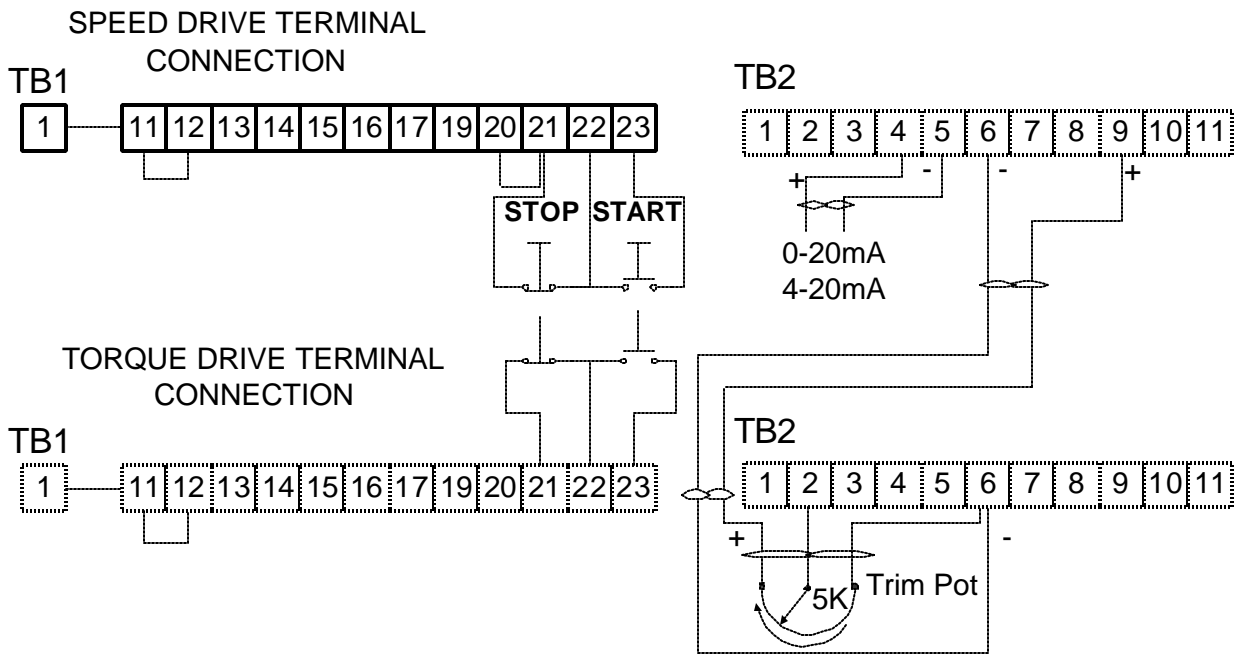+   -

5K   Trim Pot

Figure 5.2.1b. Terminals Connection using 0-20mA or 4-20mA for section 5.2.1b