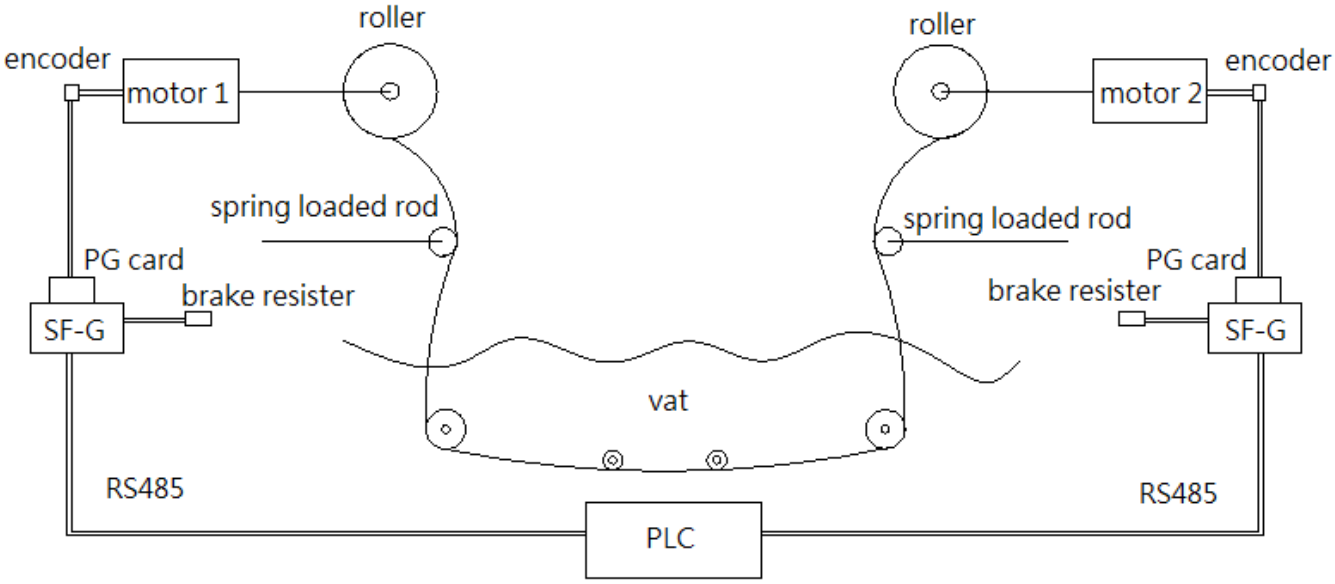
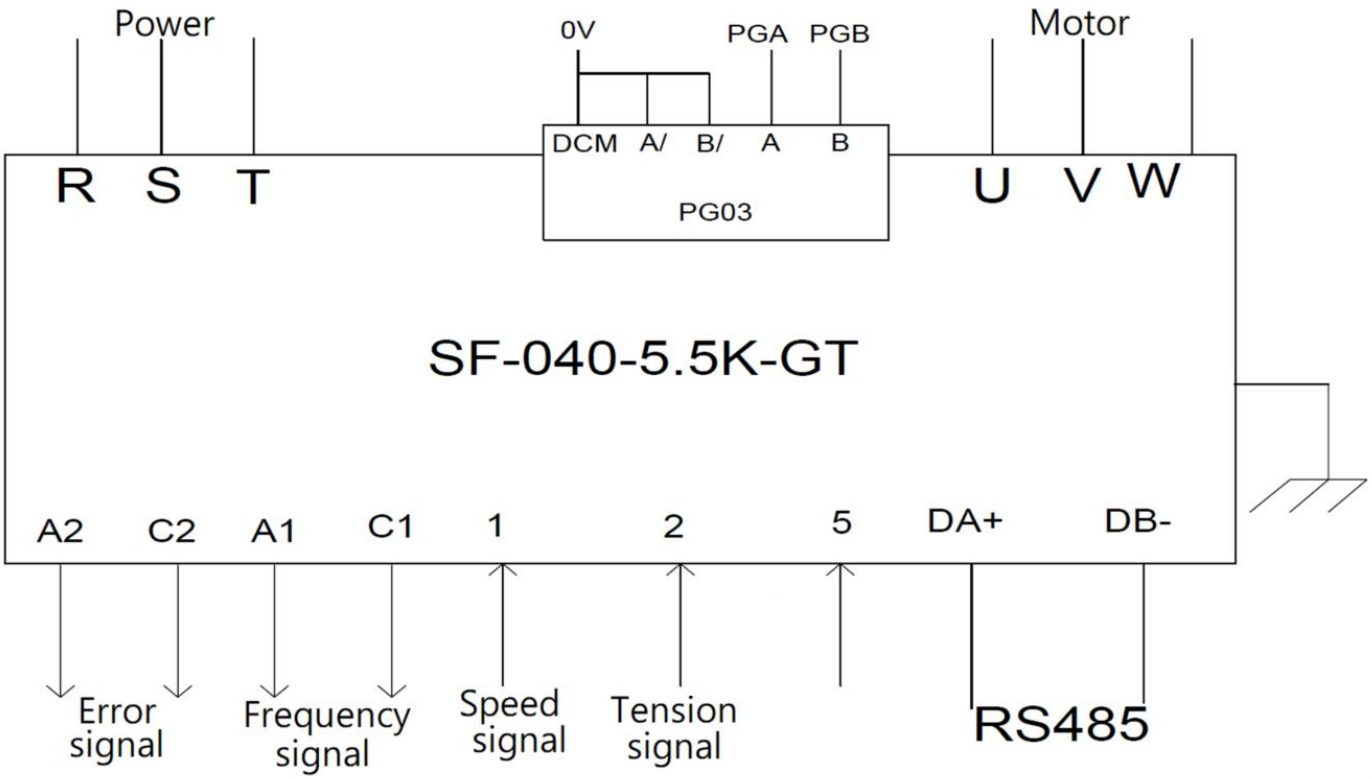
SF-GT (specialized model) on dyeing machine



Requirements:

1. Use HMI and PLC to communicate with two inverters to start, stop, change direction, and monitor the whole process.
2. Do tension control without tension sensor, open loop tension control under close loop vector control, using encoder.
3. Output speed, tension, frequency and error signal.

Wiring diagram:



We use a push pull type encoder so it's wired as above. This is a specialized model SF-GT which has an output signal on terminal 1 5, the T on the SF-GT means that this SF-G has the same tension control function on SA3 and SE3.

Photo:

Parameters changed:

Number	Name	Setting range	Default value	Set value
P.1	Max frequency	0~120Hz	120Hz	50Hz
P.7	Acceleration time	0~360s/0~3600s	20s	30s
P.8	Deceleration time	0~360s/0~3600s	30s	1.5s
P.30	Brake function	0,1	0	1
P.70	Regeneration rate	0 ~ 30.0%	0%	15
P.73	Input voltage range	0(0~5V) 1(0~10V)	0	1
P.79	Operation mode	0~8	0	3
P.300	Motor control mode	0~6	0	4
P.301	Motor auto-tuning	0~4,8~10	0	2
P.302	Motor rated power	0~315.00KW	0.00KW	4KW
P.303	Motor poles	0~48	4	4
P.304	Motor rated voltage	0~440V	440V	380V
P.305	Motor rated frequency	0~650Hz	60Hz	50Hz
P.306	Motor rated current	0~500.00A	/	8.8A
P.307	Motor rated speed	0~65000r/min	1710rpm	1440rpm
P.350	Encoder pulse per round	0~20000 pulses	1024 pulses	1000 pulses
P.351	Encoder type	0~4	0	2
P.352	PG detect error time	0~100.0s	1.0s	0
P.500	2 5 terminal function	0~17	1	5
P.502	1 5 terminal function	0~17	1	6
P.530	1 5 input voltage range	0 1	0	1
P.603	Gear ratio	0~300.0	1	9.5
P.604	Tension source	0 1 2	0	1
P.606	Maximum tension	0~30000N	0	480N
P.610	Roll diameter calculate method	0 1 2 3	0	1
P.611	Max roll diameter	0~10000mm	500mm	363mm
P.612	Roller itself diameter	0~10000mm	100mm	233mm
P.622	Material thickness	0.01~100mm	0.01mm	0.1mm
P.628	Maximum linear velocity	0.1~6500.0m/min	1000.0m/min	200m/min
P.656	Linear velocity source	0 1 2	0	1

P.611 is determined by the formula: Max roll diameter=roller diameter + Material thickness*Rounds of winding*2. We use 2 5 terminal with a potentiometer to control tension value, so set P.500=5, and to let the inverter read the signal from terminal, P.604 needs to be set to 1, P.656 is set to 1 for the same reason. We also set P.352 to zero to instantly show any error during operation. The P.603 gear ratio is determined by the gearbox and pulleys attached between the motor and the roller. We use the encoder to calculate the diameter so set P.610=1.

There are more diameters need change, due to the connection of HMI and PLC:

1. The P.600 P.601 can be change by PLC to switch between winding and unwinding, speed or tension control.
2. Communication setting P.32=1 P.33=1 P.36=1 P.153=0 P.154=4