Shrink wrapping machines　　　[Wrapping machines]

🔴 Features of shrink wrapping machines

"Shrink wrapping machines" have the following features:
- Packaging of material, goods and products by a wrapping film.
- Seal the film and open a small hole to let the air out.
- Shrink the film by hot air.

These machines are installed in conveyers for wrapping machines.
The capacity range of these machines is small (up to 2.2kW).
These machines are useful for the following purposes:
- Automatic wrapping and saving labor
- Water and dust protection
- Simple detection of the products by transparent film
- Reduction of packaging costs

🔴 Merits of inverter drives

Shrink wrapping machines with inverters have the following merits:
- Improving of a tact time
- Freely conveyer speed
- Stable speed with the sensor-less vector control
- Conveyer speed indication by 'frequency free unit display magnification'
- Wide range of input power supply voltage

Rated power supply of inverters

Point

Power supply	Motor capacity	Type
Single phase, 100V (100 ~ 115Vac)	0.1 ~ 0.75kW (3 phase, 200V)	VF-nC3
Single phase, 200V (200 ~ 240Vac)	0.2 ~ 2.2kW (3 phase, 200V)	VF-nC3, VF-S15
3 phase, 200V (200 ~ 240Vac)	0.1 ~ 90kW (3 phase, 200V)	VF-nC3, VF-S15, VF-AS1, VF-PS1
3 phase, 400V (380 ~ 500Vac)	0.4 ~ 15kW (3 phase, 400V)	VF-S15
3 phase, 400V (380 ~ 480Vac)	0.75 ~ 630kW (3 phase, 400V)	VF-AS1, VF-PS1

Notice: In single phase input model, the output voltage is situated over 80% speed.
In this case, please decrease the output torque.

🔔 Notices regarding the use of inverter drives

- Motor rating

The capacity range of the "Shrink wrapping machines" is small. Sometimes, there is a 100V motor rating. In this case, please change the motor from 100V rating to 3 phase, 200V rating. (The inverter is designed for 3 phase 200V or 400V motor.)

> If you have only a single phase 100V power supply, please select the VF-nC3 series that has a line-up for single phase 100V input / 3 phase 200V output.
>
> **Point** VFNC3S-1001P (0.1kW)
> VFNC3S-1002P (0.2kW)
> VFNC3S-1004P (0.4kW)
> VFNC3S-1007P (0.75kW)

- Motor maximum speed

The motor maximum speed depends on the motor specifications.
Please confirm the specifications of the manufacturer of your motor.
The specification of TOSHIBA motor is the following:

Capacity [kW]	Allowable frequency [Hz]		
	2 poles	4 poles	6 poles
0.4	60	120	120
0.75	60	120	120
1.5	60	120	120
2.2	60	120	120
3.7	60	120	120
5.5	60	120	120
7.5	60	90	90
11	60	90	90
15	60	90	90
18.5	60	90	90
22	60	90	90
30	60	90	90
37	60	90	90
45	60	90	60

- Electromagnetic noise

The inverter is generating "electromagnetic noise".
If there are some high accuracy sensors or other sensitive equipment near the inverter drive, the inverter's noise may cause some trouble or a malfunction.
Electromagnetic noise can be avoided by installing an external noise filter or using a different wiring method.

- **Harmonics**

The inverter is generating "harmonics".
These harmonics sometimes cause a malfunction in other control equipment that is connected to the same power source.
Harmonics can be avoided by installing an external "reactor".

To decrease "harmonics", we recommend to install DC reactors in all our inverter models.
(NOTE: 100V input models require AC reactors.)

Selection

In almost all cases, the capacity of the inverter is the same as the motor capacity.
However if you have a fixed acceleration/deceleration time, the inverter capacity should be larger than the motor capacity.

> Please confirm your motor's rated current.
> [Motor's rated current] x 1.05 < [Inverter's rated current]
>
> **Point** When you connect several motors to one inverter, please confirm the following:
> [Total motor's rated current] x 1.1 < [Inverter's rated current]
>
> In this case, the electric thermal function in the inverter can't protect all motors.
> Please install an external thermal relay for each motor.

Application samples

In case of the conveyer, it is usually installed following operation method:
- RUN and STOP by remote control.
- Speed adjustment by an analog input(0-10V)
- Speed adjustment by the preset frequency
- Frequency free unit display
ex. F702 = [50m/min] / 60Hz = 0.83

Connection of inverters

Connection diagram of inverters (VF-nC3)
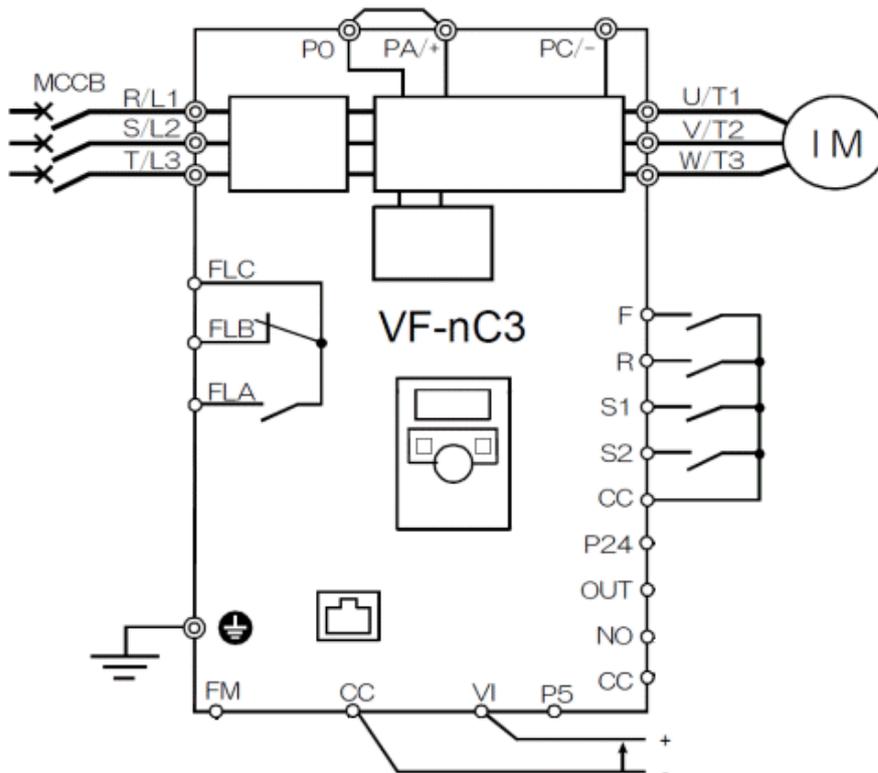
Setting table for inverters (VF-nC3)

Title	Function	Setting range	Recommended setting
CMOd	Command mode selection	0: Remote, 1: Local	0
FMOd	Frequency setting mode selection	0: Remote, 1: Setting dial 1, 2: Setting dial 2, etc.	0
Sr1	Preset speed frequency 1	Lower limit frequency [LL] ~ Upper limit frequency [UL]	20
Sr2	Preset speed frequency 2	Lower limit frequency [LL] ~ Upper limit frequency [UL]	40
Sr4	Preset speed frequency 4	Lower limit frequency [LL] ~ Upper limit frequency [UL]	60
Sr4	Input terminal selection (R)	0 to 201	14
F701	Unit selection	0: Disabled, 1: % => V/A	2
F702	Frequency units selection	0.01 ~ 200	0.83