MEIDEN

MEIDEN
AC SPEED CONTROL EQUIPMENT
THYFREC-VT110S

200V 1PH System 0.4 to 2.2kW
400V 3PH System 0.75 to 2.2kW

QUICK START GUIDE

NOTICE

1. Read this manual thoroughly before using the VT110S, and store in a safe place for reference.
2. Make sure that this manual is delivered to the final user.

MEIDENSHA CORPORATION

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Warning

This Quick Start Instruction Guide is intended as a guide only.

Read the Instruction Manual thoroughly before using the VT110S.

Use extreme caution during installation.

Do not open the front cover while power is applied.

Always ground the Inverter heatsink.

If in doubt, refer to your supplier or

MEIDEN DRIVELINE Tel: 01908 276000

The information contained in this publication, including numerical data, has been prepared as a general guide to the product. No responsibility is assumed for errors herein. Meiden Europe Ltd reserve the right to make changes to this document and Instruction Manual at any time.

E&OE

Installation

Install the Inverter vertically, so that the cable glands face downwards. Allow for the correct spacing around the Inverter for ventilation (X +>50mm, Y +>150mm). **Fig. 1.**

Always ensure that the Inverter is switched off before wiring.

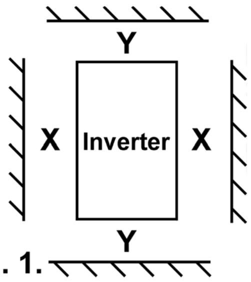

Fig. 1.

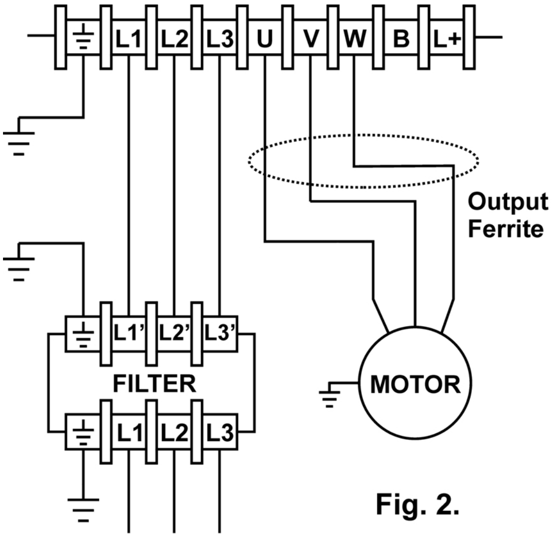

Fig. 2.

Connect wiring as shown in **Fig. 2.** Make sure that correct short circuit protection devices are fitted and best wiring practises are observed (see page 3 in the supplied manual).

Caution **For Single Phase drives, do not connect to the L3 terminal, as this is not used. Do not connect Single Phase drives to voltages exceeding 240V AC.**

A Ferrite is supplied with the filter, which must be fitted to meet EMC compliance. The motor phase cables must be inserted through the output ferrite as per *EMC Filter Kits—Guide to Installation and Use.*

Voltage Surge

For long motor cable lengths (>30m), a motor choke can be ordered which must be fitted between the Inverter and the motor. Motor cables must be screened at both ends.

Connect inputs as shown in **Fig. 3.** or to suit your application. If using a potentiometer, connect the “wiper” to **FSV** terminal. Analogue signal cables **MUST** be screened. Connect one end of the screen to **COM.**
The **COM** terminals are linked internally.
RY0 is isolated and must **NOT** be connected to **COM.**

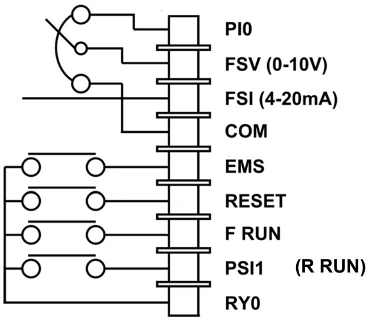

Fig. 3.

Test Running the Drive

Default settings allow the basic running of the motor to prove the system, but first set:

Single Phase:	**b9-6**	set 5 assuming 240V, 50Hz supply.	**b9-7**	Preset Frequency may need to be set for other than 50Hz supply and 50Hz O/P freq.
Three Phase:	**b9-6**	set 3 assuming 415V, 50Hz supply.	**b9-7**	Preset Frequency may need to be set for other than 50Hz supply and 50Hz O/P freq.

On power up, the Inverter display will cycle through a self-diagnostics check, and then show oFF confirming the drive is in a ready state.

Close the **FRUN** terminal, and the motor will ramp up to 10Hz in a forward direction. The display will change from oFF to 10.00 (local frequency setting **A0-0**).
Close **RRUN** terminal (if connected) and check that the motor changes direction. Now open **FRUN/RRUN**, the motor will stop.

Acceleration and Deceleration will be default values at this stage.

Configuration

The Inverter parameter menu system is grouped into Blocks according to their functions and frequency of usage.

To manoeuvre around the menu system, pressing the ▲ or ▼ key will scroll through the parameters in a continuous loop. See **Fig. 4.**

The display will alternate between the parameter number and its current value. Press SET to change the parameter value. Increase/decrease the value by using the ▲ and ▼ keys. When you have set the parameter to the value you want, press SET .

It is possible to reset to default values when the drive is not running, by setting parameter **b4-1** to 19 (page 26).

The parameter default values are such that the inverter can be quickly, and safely, checked after power on. However, some of the default values may need to be changed to suit specific applications.

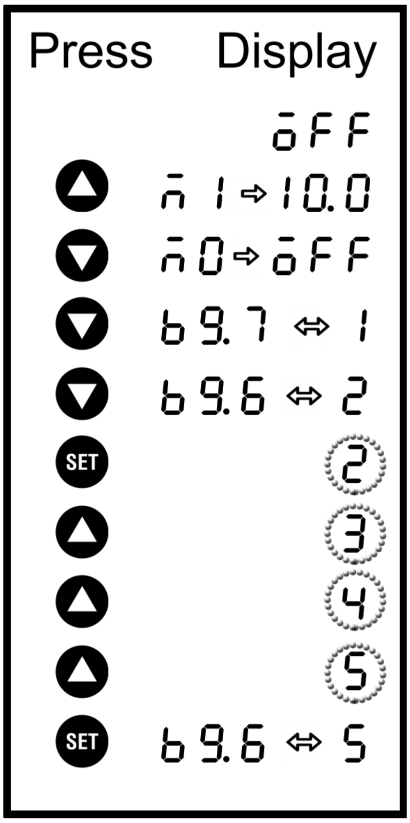

Fig.4.

Remote Running

From default, the inverter is set to run at Local speed, and is set up to accept the following signal inputs: (page 29).

FRUN	Forward Run	**PSI1**	Reverse Run
EMS	Emergency Stop **	**RST**	Reset

** by default is a normally open contact, coast to stop. Refer to manual (page 29) for options.

If necessary, set new Accel/Decel times in **A1-0** and **A1-1** (page 22).
Jog Accel/Decel can be set in **A1-4** and **A1-5** (page 22).

DC injection braking is set on from default. If not required, set **A2-5** to 0. If Dynamic Braking is required, refer to page 33 of the manual.
Please note: Dynamic braking is not available on the S10 and S15 units.

The signal reference is obtained from the 0-10V analogue input. This can be from a number of sources including a potentiometer as shown in **Fig. 3**. Set **b8-0** to 9 to enable this function. (refer to page 29 for other possible configurations).

Setting Pre-set Speeds

As well as running from 0-10V analogue reference, it is possible to set up to 4 pre-set speeds (plus Jog). The digital inputs can be programmed in a number of ways to suit the application.

A worked example of using 13.20Hz, 25Hz, 40.32Hz and 50Hz pre-set speeds is shown below:

Set **b7-1** to 0	turns off RRUN	Set **A0-4** to 13	Prog Freq 0	- 13Hz
Set **b7-5** to 0	turns off RESET	Set **A0-5** to 20	Fine Prog Freq 0	- 0.2Hz
Set **b8-2** to 9	set PROG on to enable	Set **A0-6** to 25	Prog Freq 1	- 25Hz
	pre-set speeds	Set **A0-8** to 40	Prog Freq 2	- 40Hz
Set **b8-3** to 2	uses RST as S0	Set **A0-9** to 32	Fine Prog Freq 2	- 0.32Hz
Set **b8-4** to 4	uses PSI1 as S1	Set **A0-A** to 50	Prog Freq 3	- 50Hz

Using inputs RST and PSI1 as binary inputs (see **Fig. 5**) it is possible to set any of the speeds (refer to page 21).

Sequence Command Prog	 S1	 S0	Selected Frequency
ON	OFF	OFF	Prog Freq 0 - 13.2Hz
ON	OFF	ON	Prog Freq 1 - 25Hz
ON	ON	OFF	Prog Freq 2 - 40.32Hz
ON	ON	ON	Prog Freq 3 - 50Hz
OFF	ANY	ANY	Analogue I/P

Fig.5.

Other Useful Features

Parameter (password) protection	- b4-2	Page	26
Dynamic Braking	- b3-1	Pages	26/33
4-20mA input	- b8-1	Pages	21/29
Maximum frequency	- A4-4	Page	24
Minimum frequency	- A4-5	Page	24

Parameter Listing

Param	Description		Min - Max
Monitor/(Display) Parameters			
n̄ 0	O/P frequency	(Hz)	
n̄ 1	Setting frequency	(Hz)	
n̄ 2	O/P current	(A)	
n̄ 3	O/P current	(%)	
n̄ 4	OLT monitor	(%)	
n̄ 5	DC-Link voltage	(V)	
n̄ 6	O/P voltage	(V)	
Fault Code			
F 0	Latest fault		
F 1	Previous fault		
A Parameters			
Frequency setting			
A0-0	Set local frequency	(Hz)	**0.10 - Fmax**
A0-1	Fine setting for local frequency	(Hz)	**0.10 - Fmax**
A0-2	Set jog frequency	(Hz)	**0.10 - Fmax**
A0-3	Fine setting for jog frequency	(Hz)	**0.10 - Fmax**
A0-4	Program frequency - 0	(Hz)	**0.10 - Fmax**
A0-5	Fine setting for Prog freq - 0	(Hz)	**0.10 - Fmax**
A0-6	Program frequency - 1	(Hz)	**0.10 - Fmax**
A0-7	Fine setting for Prog freq - 1	(Hz)	**0.10 - Fmax**
A0-8	Program frequency - 2	(Hz)	**0.10 - Fmax**
A0-9	Fine setting for Prog freq 2	(Hz)	**0.10 - Fmax**
A0-A	Program frequency - 3	(Hz)	**0.10 - Fmax**
A0-b	Fine setting for Prog freq 3	(Hz)	**0.10 - Fmax**
Acceleration/deceleration times			
A1-0	Acceleration time - 1	(s)	**0.1 - 99.9**
A1-1	Deceleration time - 1	(s)	**0.1 - 99.9**
A1-2	Acceleration time - 2	(s)	**0.1 - 99.9**
A1-3	Deceleration time - 2	(s)	**0.1 - 99.9**
A1-4	Jog acceleration time	(s)	**0.1 - 99.9**
A1-5	Jog deceleration time	(s)	**0.1 - 99.9**
A1-6	Time unit multiplier		**1 - 100**
Torque boost and DC brake			
A2-0	Torque boost voltage	(%)	**0.0 - 25.0**
A2-1	Reduced volt squ law trq	(%)	**0.0 - 25.0**
A2-2	Auto torque boost gain	(%)	**0.0 - 20.0**
A2-3	Slip compensation gain	(%)	**0.0 - 20.0**
A2-4	DC braking voltage	(%)	**0.0 - 20.0**
A2-5	DC braking time	(s)	**0.0 - 20.0**
A2-6	Start frequency	(Hz)	**0.1 - 60.0**
A2-7	Stop frequency	(Hz)	**0.1 - 60.0**
Frequency skip			
A3-0	Skip frequency 0	(Hz)	**0 - 440**
A3-1	Skip band 0	(Hz)	**0.0 - 10.0**
A3-2	Skip frequency 1	(Hz)	**0 - 440**
A3-3	Skip band 1	(Hz)	**0.0 - 10.0**
A3-4	Skip frequency 2	(Hz)	**0 - 440**
A3-5	Skip band 2	(Hz)	**0.0 - 10.0**
Ratio Interlock setting			
A4-0	Polarity coefficient setting (A)		**1 - 2**
A4-1	Polarity bias setting (B)		**1 - 2**
A4-2	Coefficient A value		**0.01 - 9.99**
A4-3	Bias B value	(Hz)	**0 - 440**
A4-4	Upper limit	(Hz)	**0 - 440**
A4-5	Lower limit	(Hz)	**0 - 440**
Detect level			
A5-0	ATN detect band	(%)	**0.0 - 20.0**
A5-1	IDET current detect level	(%)	**5 - 300**
A5-2	SPD speed detect level	(%)	**1 - 105**

Param	Description		Min - Max
B Parameters			
Serial transmission setting			
b2-0	Transmission usage		
b2-1	Baud rate		
b2-2	Parity		
b2-3	Parameter lock		
b2-4	Station No.		
b2-5	Response timer		
Overcurrent limit			
b3-0	Drive current limit	(%)	**50 - 300**
b3-1	Regenerative torque limit	(%)	**10 - 300**
Special operation			
b4-0	Fault reset		**0 - 255**
b4-1	Default values load		**0 - 255**
b4-3	Parameter lock		**0 - 255**
Start interlock			
b5-0	Start/stop frequency	(Hz)	**0.0 - 20.0**
b5-1	Start/stop hysterises	(Hz)	**0.0 - 20.0**
b5-2	Interlock frequency	(Hz)	**0.0 - 20.0**
Control method			
b6-0	RUN command method		**1 - 3**
b6-1	FRUN, RRUN stop method		**1 - 2**
b6-2	FJOG, RJOG stop method		**1 - 2**
b6-3	Auto start		**1 - 3**
b6-4	EMS command input logic		**1 - 2**
b6-5	EMS stop method		**1 - 3**
Prog I/P config 1 - operating commands			
b7-0	F RUN		**0 - 9**
b7-1	R RUN		**0 - 9**
b7-2	F JOG		**0 - 9**
b7-3	R JOG		**0 - 9**
b7-4	EMS		**0 - 9**
b7-5	RESET		**0 - 9**
b7-6	HOLD		**0 - 9**
b7-7	CSEL		**0 - 9**
b7-8	COP		**0 - 9**
Prog I/P config 2 - select commands			
b8-0	VFS		**0 - 9**
b8-1	IFS		**0 - 9**
b8-2	PROG		**0 - 9**
b8-3	S0		**0 - 9**
b8-4	S1		**0 - 9**
b8-5	FUP		**0 - 9**
b8-6	FDW		**0 - 9**
b8-7	FUP/FDW step	(Hz)	**0.01 - 2.00**
b8-8	Relay O/P terminal parameter		**0 - 7**
b8-9	Operation panel initial mode		**0 - 6**
Output ratings			
b9-0	Max O/P frequency (Fmax)	(Hz)	**3 - 440**
b9-1	Base frequency (Ftrq)	(Hz)	**0 - 440**
b9-2	O/P voltage	(V)	**0 - 460**
b9-3	Carrier frequency	(kHz)	**3 - 12**
b9-4	Overload setting	(%)	**20 - 105**
b9-5	0Hz overload	(%)	**10 - 105**
b9-6	I/P voltage		**1 - 5**
b9-7	Preset Fmax/Ftrq pattern		**0 - 9**

Non-default Parameters

Inverter…………………………..

Job No…………………………..

Reference………………………..

Parameter	Set To..	Notes	Parameter	Set To..	Notes