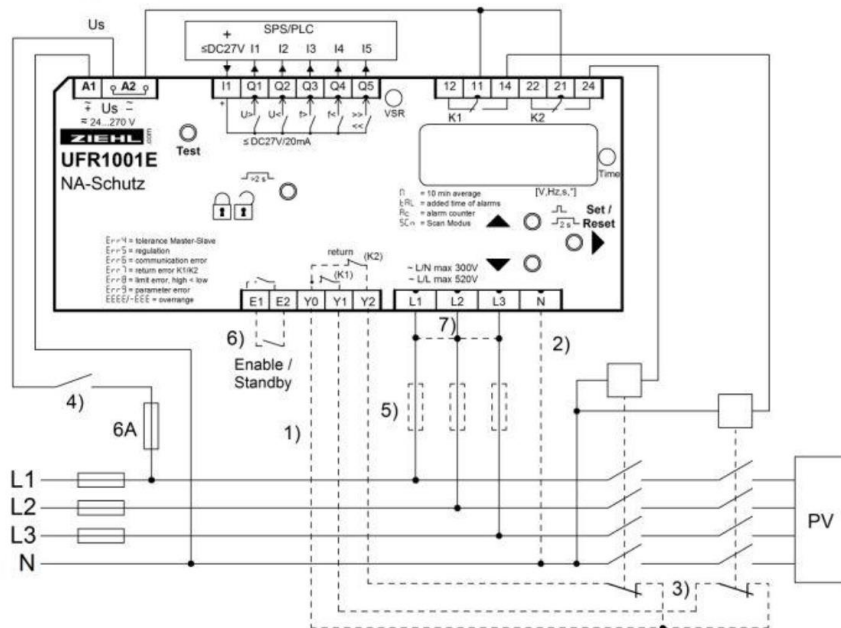## Connection diagram

- Bridge L1 - L2 - L3 when single phase are used.
- Return wires (Feedback from Contactors) are not required in SA.
- Use 48VDC to power the unit, but you can chose to use the grid voltage.
- Grid voltage to switch the contactors.
- 63Amp Din rail mount DB contactors (Schneider)

- **<u>Putting the unit into programming mode:</u>**
- Switch the supply on.

- Look at the following picture.
- The unit comes with the seal not in place.
- If the Led between the 2 locks are Red, slightly lift the key cover and turn it 180 degree. While turning you will see a Small blue pin like switch behind the key cover.
- Use the key cover and press down firmly on the blue pin for 2 seconds.
- The Led should turn to Green now.
- Once the LED is Green you can continue with the configuration.

- **<u>Configuration:</u>**
- There are 2 Programs to choose from
- PRG5 is used for 230Volt Phase to Neutral, 1 or 3 Phase
- PRG6 is used for 400Volt phase to phase systems with no Neutral.
- Press the **UP** arrow 1 time to display "**InFo.**"
- Press the **RIGHT** button 5 times to display "**PR 1**"
- Press the **UP** button till you reach "**PR 5**" or "**PR 6**"
- Press the **RIGHT** button 1 time to display "**no**"
- Press the **DOWN** button 1 time to display "**YES**"
- Press the **Right** button.
- The Device will reset and start with the new program.
- Every time a new program is selected, all the settings revert to the default settings.
- **<u>Changing Settings:</u>**
- ONLY after you selected the relevant program for your installation, you should continue to the settings.
- Press the UP button 2 times to get to the first Menu on the Settings LIst.
- Use the Right Button to Scroll through the 5 settings of each Parameter.
- Use the UP and Down buttons to change the setting to mach the settings on the list.
- Once done with all 5 settings, use the UP button to scroll to the next Parameter on the list.
- The settings for South Africa are as follows.

Default settings and firmware version, NRS 097-2-1:2017
When changing programs, all parameters are reset to the default settings.

Menu	Parameter / Unit		Settings for South Africa		Users Data
			3 AC 230 V / N (With neutral) PrS	AC 400 V / N (Without neutral) Pr6	
U⁻⁻	U⁻⁻	Alarm on/off	on	on	
	U⁻⁻	Overvoltage	V	264 > 276 / (120 %)	458 > 478 / (120 %)	
	H⁻⁻	Hysteresis	V	3.0	3.0	
	dAL	Response time	s	0.10 > 0.16	0.10 > 0.16	
	doF	OFF-delay	s	60	60	
U⁻	U⁻	Alarm on/off	on	on	
	U⁻	Overvoltage	V	248 > 253 / (110 %)	430 > 438 / (110 %)	
	H⁻	Hysteresis	V	3.0	3.0	
	dAL	Response time	s	60.00 > 2.0	60.00 > 2.0	
	doF	OFF-delay	s	60	60	
Un	Un	Alarm on/off	oFF	oFF	
	Un	Overvoltage	V	253	438	
	Hn	Hysteresis	V	3.0	3.0	
	dAL	Response time	s	0.10	0.10	
	doF	OFF-delay	s	60	60	
U_	U_	Alarm on/off	on	on	
	U_	Undervoltage	V	104 > 196 / (85 %)	348 > 339 / (85 %)	
	H_	Hysteresis	V	3.0	3.0	
	dAL	Response time	s	210 > 10.0	210 > 10.0	
	doF	OFF-delay	s	60	60	
U__	U__	Alarm on/off	on	on	
	U__	Undervoltage	V	104 > 115 / (50 %)	180 > 199 / (50 %)	
	H__	Hysteresis	V	2.0	2.0	
	dAL	Response time	s	0.3 > 0.2	0.3 > 0.2	
	doF	OFF-delay	s	60	60	
F⁻⁻	F⁻⁻	Alarm on/off	oFF	oFF	
	F⁻⁻	Overfrequency	Hz	51.50	51.50	
	H⁻⁻	Hysteresis	Hz	1.45	1.45	
	dAL	Response time	s	0.10	0.10	
	doF	OFF-delay	s	60	60	
F⁻	F⁻	Alarm on/off	on	on	
	F⁻	Overfrequency	Hz	51.50 > 52.00	51.50 > 52.00	
	H⁻	Hysteresis	Hz	1.45	1.45	
	dAL	Response time	s	0.10 > 4.0	0.10 > 4.0	
	U⁻⁻	Alarm on/off	s	60	60	
F_	F_	Alarm on/off	on	on	
	F_	Underfrequency	Hz	47.50 > 47.0	47.50 > 47.0	
	H_	Hysteresis	Hz	1.00	1.00	
	dAL	Response time	s	0.10 > 0.2	0.10 > 0.2	
	doF	OFF-delay	s	60	60	
F__	F__	Alarm on/off	oFF	oFF	
	F__	Underfrequency	Hz	47.50	47.50	
	H__	Hysteresis	Hz	1.00	1.00	
	dAL	Response time	s	0.10	0.10	
	doF	OFF-delay	s	60	60	

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Menu	Parameter / Unit			Settings for South Africa 🇿🇦		Users Data
				3 AC 230 V / N (With neutral)	3 AC 400 V / N (Without neutral)	
				Pr5	Pr6	
UonF	UonF	on/off		oFF	oFF	
	UonF	voltage	V	46.0	46.0	
uSr	uSr	Alarm on/off		StbY	StbY	
	uSr	Vector shift	°	10.0	10.0	
	doF	OFF-delay	s	3	3	
	dEon	Suppression time	s	3	3	
	uSr	Number of phases		3Ph	3Ph	
rocF	rocF	Alarm on/off		oFF	oFF	
	dFdt	delta f / delta t	Hz /s	0.800	0.80	
	PEr	periods		20	20	
	dAL	Response time	s	0.10	0.10	
	doF	OFF-delay	s	60	60	
rEL	trEL	Response time Yx	s	oFF	oFF	
	doFA	Mode		ind	ind	
	doFA	Off-delay all	s	0	0	
ddi	ddi	Display delay	s	0.5	0.5	
	di t	Display duration SCn	s	3.5	3.5	
Si	U	Voltage	V	230	400	
	F	Frequency	Hz	50.00	50.00	
	uSr	Vector shift	°	0.0	0.0	
CodE	Pi n	Pincode		504	504	
InFo	Fnr	Firmware version		0-08	0-08	
	Snr	Serial number		xxxx	xxxx	
	h	Operating hours	h	xxxx	xxxx	
	Err	Error counter		xxx	xxx	
	Pr	Program		5	6	

- Once you done, remove and re-apply the power, the unit will go through a 60 Second "self check" that might be followed by another count down.
- Once that is complete and all conditions are within spec, the Contactors should energize.
- Once you are satisfied with the settings, press the blue pin till the LED turns red.
- Apply the seal, but dont crimp until settings are checked
- When combined with a Victron inverter, you need only one contactor. The NRS097 requirement is that you must have two relays in series and that a single failure must not break the system (ie there must be some redundancy).
- The Multi already has one such relay and LOM-detection (loss of mains). Adding the Ziehl with just one relay is sufficient to tick the second box

Notes

The OverFrequency 1 bar is specified above and in the manual as a default Hysteresis 1.45 when it is actually a default of 1.95, do not change this parameter, it is a "copyedit error/typo" in the manual and is not intended to be changed from the default value