

# POWER FACTOR SYSTEMS



DELTA VFD USER MANUAL

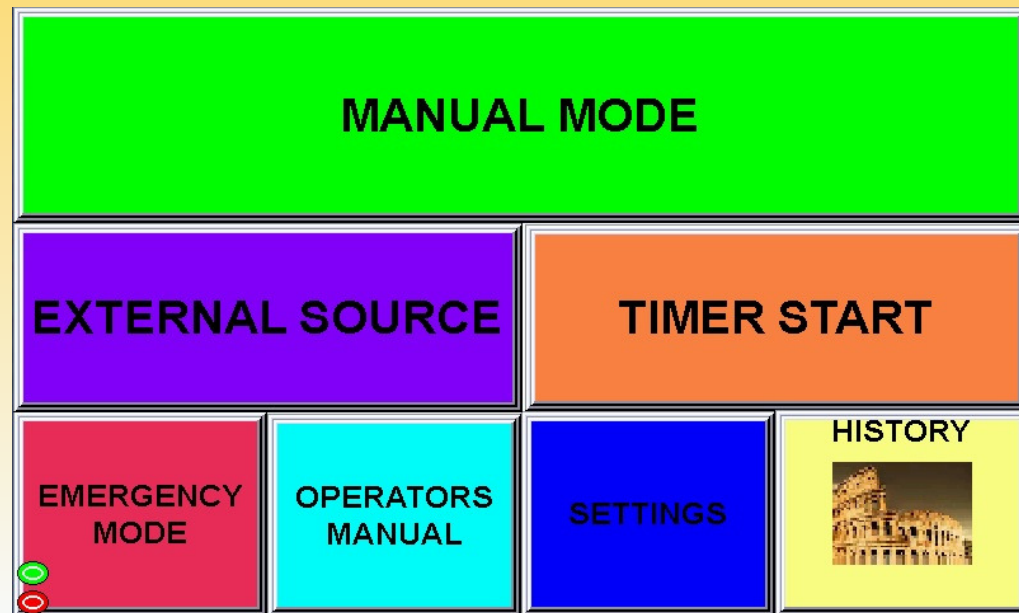
## • GETTING STARTED

1: Power up - On first power up and each time power is cycled, you will see this on the HMI (Human Machine Interface).



This will take 30 seconds and then the Loading sign will be removed automatically.

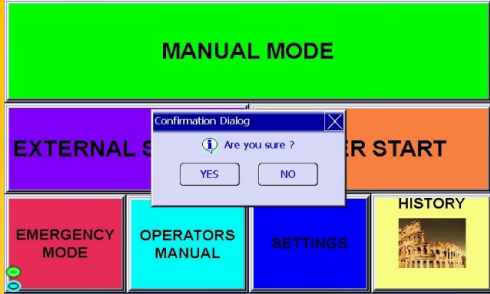
2: Main page - Welcome to the main screen.



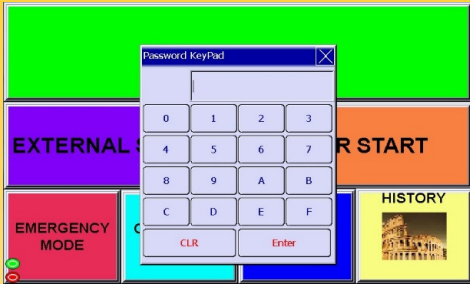
3: Settings - Select the settings button



You will be asked to confirm  
YES to proceed and No to exit.



If YES was selected, you will be prompted for the password (12345)



4: User settings - You have now entered the user settings page.

Select normal setup or pivot setup – in pivot setup you can run two different pressures in Field 1&2 by closing the FOR terminal for field 1 and REV for field 2.

Typically the end gun signal will be used to activate the second pressure.

**PRESS TO ENTER**

**NORMAL SETUP PAGE**

**PRESS TO ENTER**

**PIVOT 2 PRESS SETUP PAGE**

THIS CAN BE USED TO ACTIVATE A SECOND PRESSURE ON A PIVOT THAT HAS A UPHILL SECTION, BY USING THE ENDGUN SIGNAL TO SWITCH A RELAY THAT WILL ACTIVATE A HIGHER PRESSURE FOR THE DURATION OF THE ENDGUN

5: Pressure settings (Bar) - Up to seven different pressure settings can be selected by pressing the desired Field or pressure setting.

Note: If the pressure setting is above the capability of the pump, the motor will then run to full speed or current limit - pressure regulation will not be possible.

2.0	FIELD 1 PRESSURE	SET
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6: Pipe filling time (sec) – This can be selected to fill the pipelines at a lower speed to prevent burst pipes. Max value 3200sec.

0.0	PIPE FILLING TIME IN SEC	SET
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7: Pipe filling speed (Hz) – Select the desired speed for the pipe filling time. 0Hz = 0Rpm and 50Hz = motor full speed.

0.00	PIPE FILLING SPEED IN HZ	SET
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8: Priming time (sec) – Some systems require priming. The priming time can be set here. Max value 3200sec. Priming solenoids can be connected to relay 1 ( see electrical drawing) with a maximum inrush current of 3A.

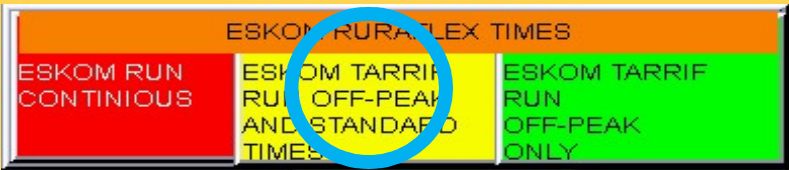
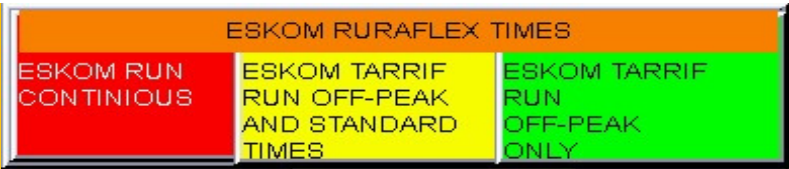
0.0	PRIMING TIME IN SECONDS RELAY 1	SET
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9: Eskom Ruraflex times – Three options are available.  
Note: If you do not use Ruraflex – select continuous.

Continuous – The system will run, regardless of the Eskom Ruraflex time.

Off peak and standard – The system will only run during Standard and Off peak times.

Off Peak – The system will only run during Off Peak Times.



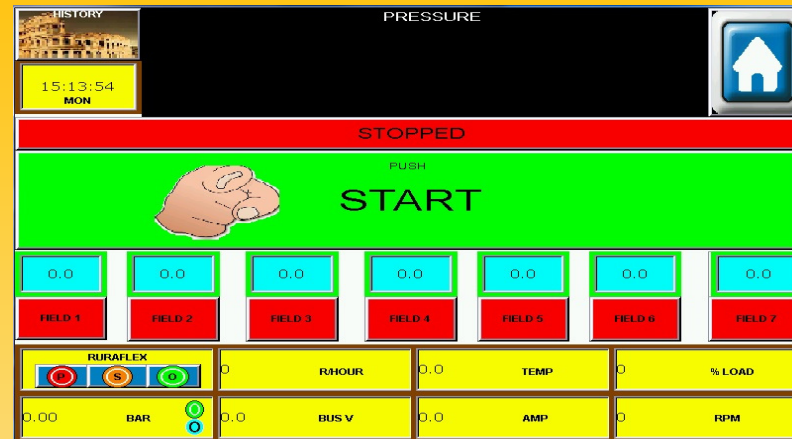
10: Engineering – Only accessible by the engineer.



11: Maintenance reset – Every two weeks you will be prompted to maintain your system.  
This button will clear the maintenance notification.

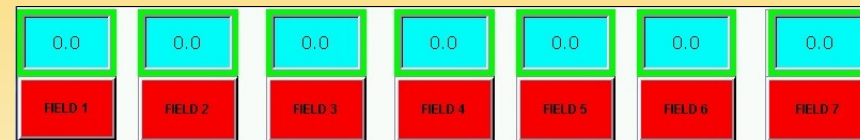


## • MANUAL MODE



12: Starting the system – Press the start button.

13: Select a field / pressure that must be maintained.



The start sequence have now been activated.

If a priming time was activated in settings – system will indicate



and the

If pipe filling was activated in settings – the system will indicate



and the

laps time. After the pipe filling time, the system will start to regulate the pressure.

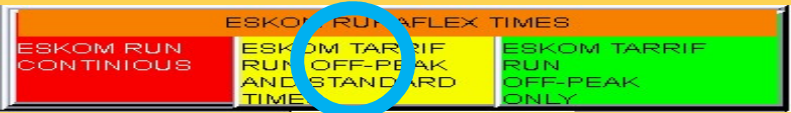


14: Power failure – After a power failure the system will auto restart.

15: Ruraflex – If Off peak was selected in settings the system will stop during peak and standard times but will auto restart when Off peak time is relevant.



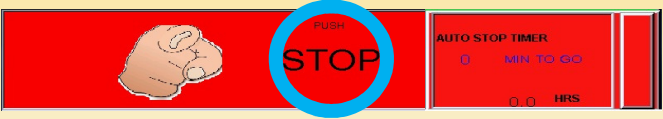
If Off peak and Standard was selected the system will stop during Peak times and auto restart when peak time has passed.



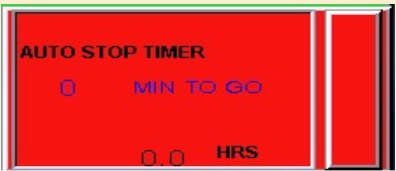
If Continuous was selected the system will run regardless the Eskom time.



16: Stopping the system - Press the stop button or use the auto stop



timer function by pressing to go is displayed in blue.



## • EXTERNAL SOURCE



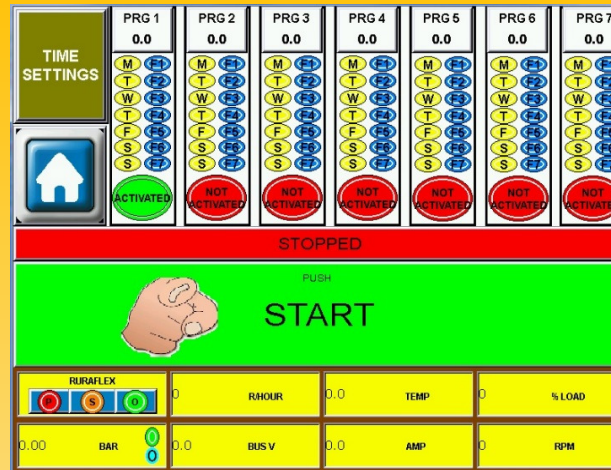
17: External source – This was developed to accommodate irrigation computers. Seven Fields / pressures can be activated via the digital inputs (see electrical drawing). Please note that the 24vdc source provided at terminal 3 (white wire) must be used and not an external power supply.

The system is also equipped with a safety switch that can be used to halt the system ( rain sensor, Dam level, inlet pressure pressure switch or a gsm modem to remote control your system).

By entering this page, the system is activated and awaits an input. Exiting this page stops the system.

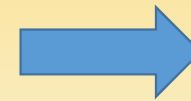


## • TIME START



18: Time start – This gives you the option to pre-program your irrigation schedule ,with 49 programming options per week. The safety switch can be used to stop and start the system ( rain sensor, dam level, inlet pressure pressure switch or a gsm modem to remote control your system).

19: How to set a schedule – Press the TIME SETTINGS button.



PROGRAM NUMBER	START TIME HR MIN	DAY OF THE WEEK	FIELD SELECT	STOP TIME HR MIN	OFF / ACTIVATED
1	14 15	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	25 30	ACTIVATED
2	0 0	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	0 0	NOT ACTIVATED
3	0 0	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	0 0	NOT ACTIVATED
4	0 0	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	0 0	NOT ACTIVATED
5	0 0	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	0 0	NOT ACTIVATED
6	0 0	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	0 0	NOT ACTIVATED
7	0 0	MON TUE WED THU FRI SAT SUN	1 2 3 4 5 6 7 8 9 10 11 12	0 0	NOT ACTIVATED
15:47:20					←

20: Schedule setup page – Program 1 to 7 can now be programmed.

21: The first block shows the program number  
Will indicate green when this program  
is running.

1	0	0	M O N	T U E	W E D	T H U	F R I	S A T	S U N	F 1	F 2	F 3	F 4	F 5	F 6	F 7	0	0	NOT ACTIVATED
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22: The second block is where you enter  
the starting hour.

1	0	0	M O N	T U E	W E D	T H U	F R I	S A T	S U N	F 1	F 2	F 3	F 4	F 5	F 6	F 7	0	0	NOT ACTIVATED
---	---	---	-------------	-------------	-------------	-------------	-------------	-------------	-------------	--------	--------	--------	--------	--------	--------	--------	---	---	------------------

23: The third block is where you enter  
the starting minutes.

1	0	0	M O N	T U E	W E D	T H U	F R I	S A T	S U N	F 1	F 2	F 3	F 4	F 5	F 6	F 7	0	0	NOT ACTIVATED
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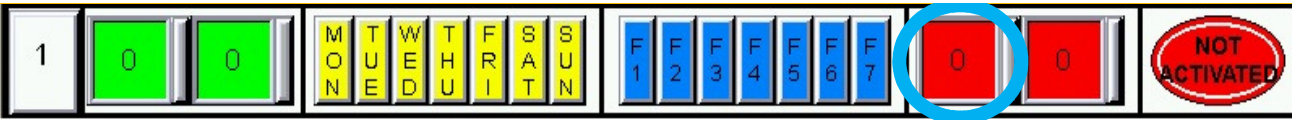
24: The fourth block is where you enter  
which day or day's the program must run.

1	0	0	M O N	T U E	W E D	T H U	F R I	S A T	S U N	F 1	F 2	F 3	F 4	F 5	F 6	F 7	0	0	NOT ACTIVATED
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25: The fifth block is where you enter  
which field / pressure must run.



1	0	0	M O N	T U E	W E D	T H U	F R I	S A T	S U N	F 1	F 2	F 3	F 4	F 5	F 6	F 7	0	0	NOT ACTIVATED
---	---	---	-------------	-------------	-------------	-------------	-------------	-------------	-------------	--------	--------	--------	--------	--------	--------	--------	---	---	------------------


26: The sixth block is where you enter the stop hour.



27: The seventh block is where you enter the stop minutes.



28: The eighth block will show if you entered a valid schedule.  Not valid.  Valid entry.

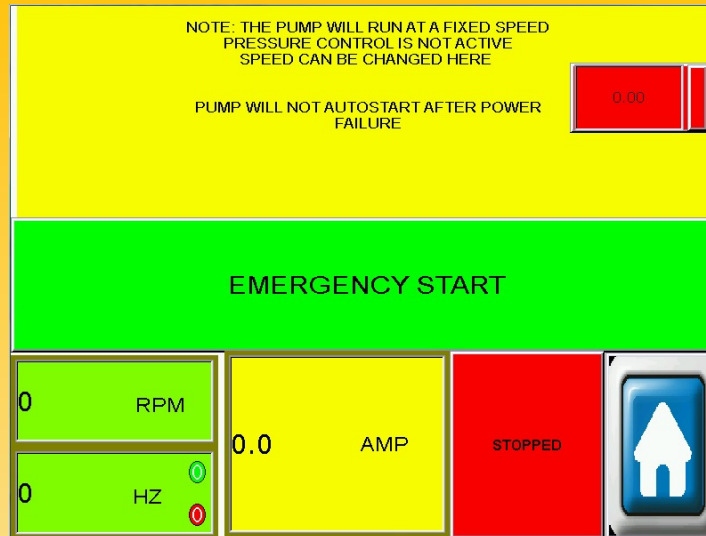
29: The above sequence can be repeated for each program needed. If you want to cancel a program just enter a zero (0) value in the hour and minute slots. You can now return to the TIME START screen. 

30: Press the start button. Your system will start when a active program is due. Stop or exit to stop the system.



Note: Remember your Ruraflex selection – if your program runs over a “no run” Ruraflex time, your system will stop during the Ruraflex time and restart when the Ruraflex time has passed.

## • EMERGENCY MODE



31: Emergency mode – This function bypasses the pressure transducer. Your system will run at a fixed speed selected by you.



0Hz = 0Rpm and 50Hz = motor full speed.

32: Press the start button **EMERGENCY START** to start and the stop button

**STOP**

Note: Full motor protection, priming and pipe filling is still active. Auto restart after power failure is off.

## • GENERAL

33: Trip indication -

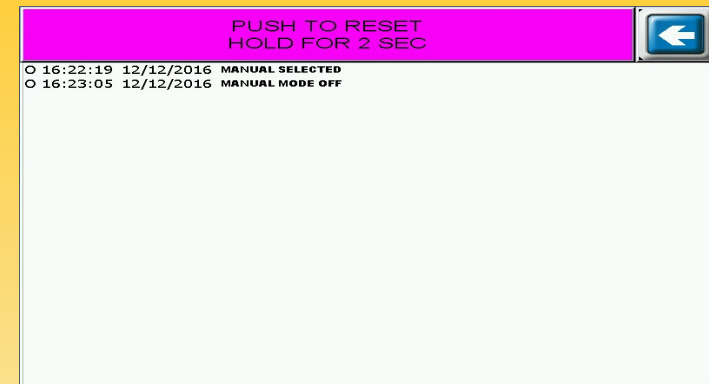
TRIP !!!  
GO-TO  
HISTORY

This indicates that a fault has occurred, go to the HISTORY button



for detail. The fault can be re-setted by pressing the RESET button for two seconds. The fault will be cleared.

Note: If it is a reoccurring fault please contact us to resolve the issue.



34: Emergency stop -



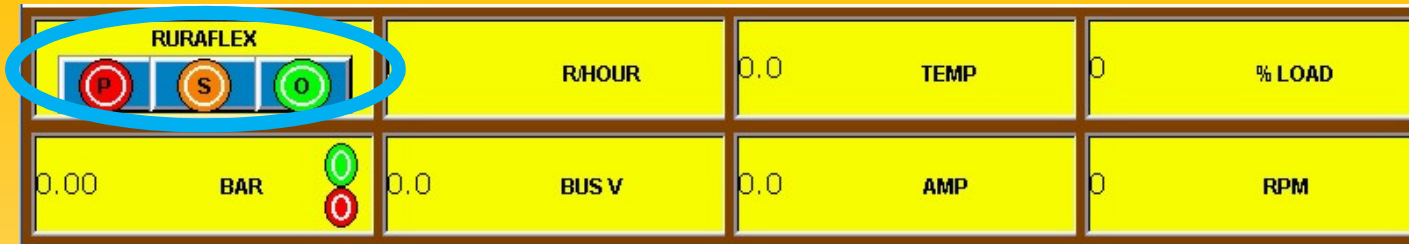
Will stop the  
System immediately.



This means that the Emergency stop push button was pressed. MAKE SHURE !!! that the emergency situation has been cleared. Twist to reset the e/stop button.

Go to History and press the reset button on the HMI for two seconds or recycle the power.

## INDICATIONS.



35: Ruraflex -



The three times of Ruraflex will be displayed by a circle, red=peak  
orange = standard and green = off peak.

Your selection will be displayed by a blue bar.



= No selection – system will not run.



= Continuous.



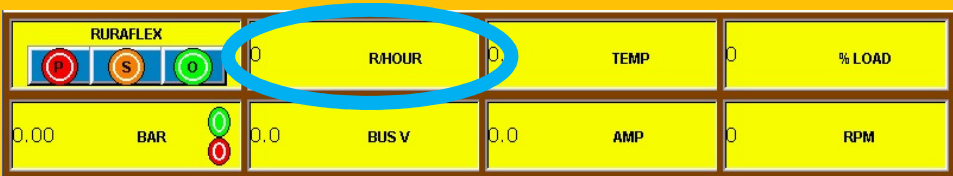
= Standard and off peak times.



= Off peak times.



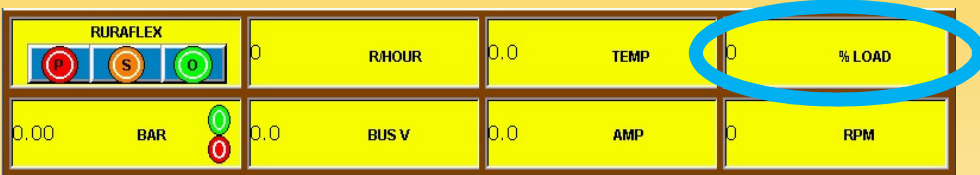
36: Running hours – Displays the running hours of the system.



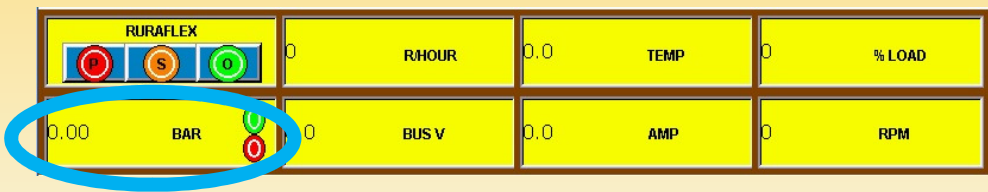
37: Temperature – Displays the internal temperature of the VFD. If the temp exceeds 90 Deg, clean the fan filters.



38: % Load – Displays the % load of the motor.



39: Pressure – Displays the actual pressure at the Pressure transducer.



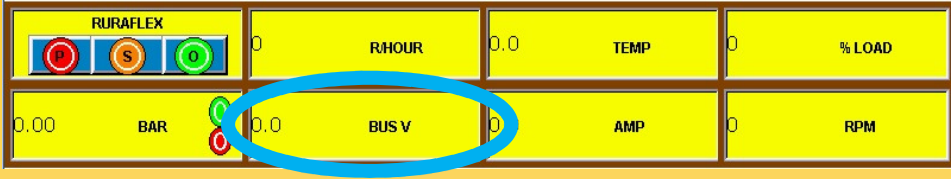
40: Transducer – A green circle inside the bar display top wright hand corner indicates a healthy transducer.



40: Safety switch – A green circle inside the bar display bottom wright hand corner indicates a healthy safety switch.  
Note: System will not run if open.



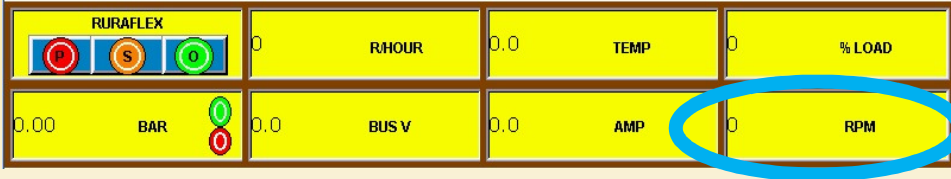
41: Bus voltage – Displays the internal DC BUS voltage of the VFD. 400V = Low limit and 800V = High limit.



42: Amp – Displays the motor current.

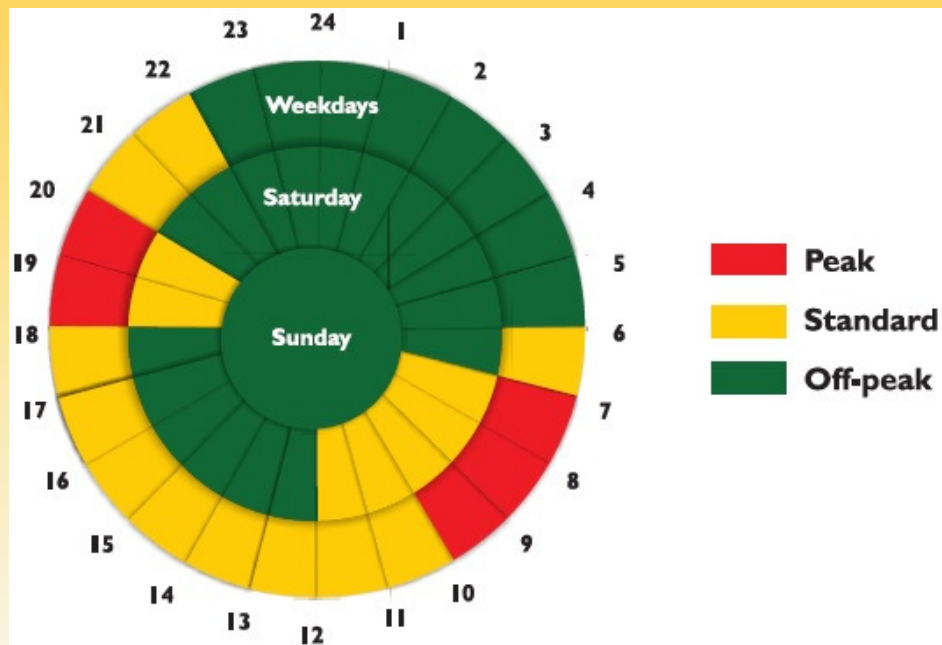


43: RPM – Displays the motor RPM.

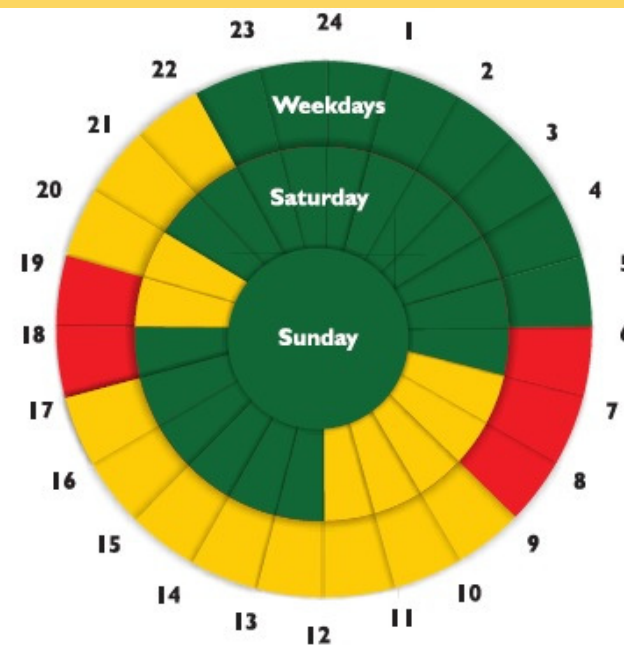


# ESKOM INFORMATION

LOW DEMAND SEASON  
SEPTEMBER – MAY



HIGH DEMAND SEASON  
JUNE - AUGUST



ENJOY YOUR SYSTEM ! — NICO: +2782 458 7429 RAYMOND: +2782 446 9484