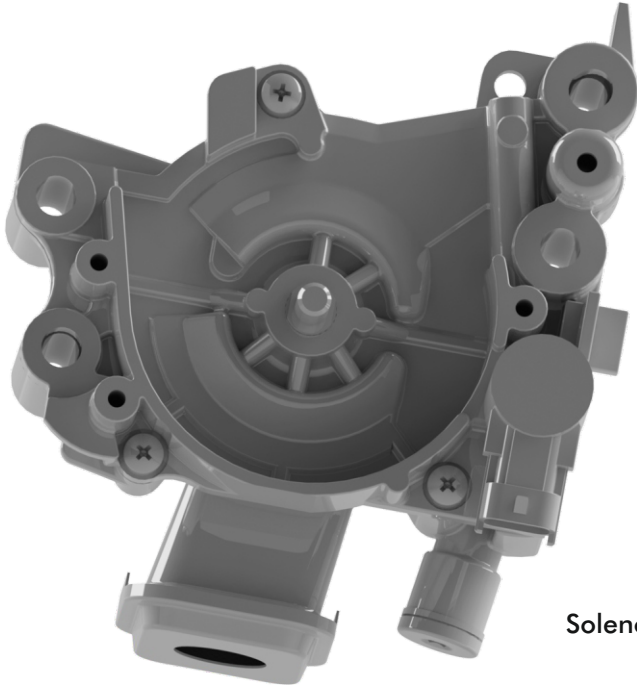


[ucal.com](http://ucal.com)

# PRODUCT RANGE

# VDOP

## VARIABLE DISPLACEMENT OIL PUMP



- ✓ High Efficiency vane type pump
- ✓ Optimized oil flow rate with low power consumption and hence less CO2 emission with better fuel economy
- ✓ Low current consumption solenoid with high durability
- ✓ Patented valve system for fail safe operation

### SALIENT FEATURES

- Optimized Vane Profile
- Solenoid Controlled Oil pressure control with Dual Valve assembly
- Precise control of Oil flow rate
- Low Power & current Consumption
- 35% power consumption reduction

PERFORMANCE TEST IN OIL	
Type of Oil : SAE 5W30 at 130°C	
Flow Rate at 700rpm – 1.4 bar . EV OFF	Qmin ≥ 7.5 l/min, Qmax = 10.5 l/min
Type of fluid : 9-11 cST at 40°C	
Flow Rate at 700 rpm – 1.4 bar . EV OFF	Qmin ≥ 10 l/min, Qmax = 13 l/min
High Pressure EV OFF (Main gallery)	4.0 bar
Low Pressure EV ON (Main gallery)	2.5 bar
Over Pressure Valve Opening	8.0 bar



# OIL PUMP

## ASSEMBLY



### SALIENT FEATURES

- ✓ Modular Design with standardised parts
- ✓ Low noise
- ✓ Minimum power consumption
- ✓ High volumetric flow and efficiency
- ✓ Long service life
- ✓ Withstand Engine / Vehicle vibrations
- ✓ Flow optimized system design
- ✓ Direct drive / Gear / Chain-driven options

### SPECIFICATIONS (AI OIL PUMP)

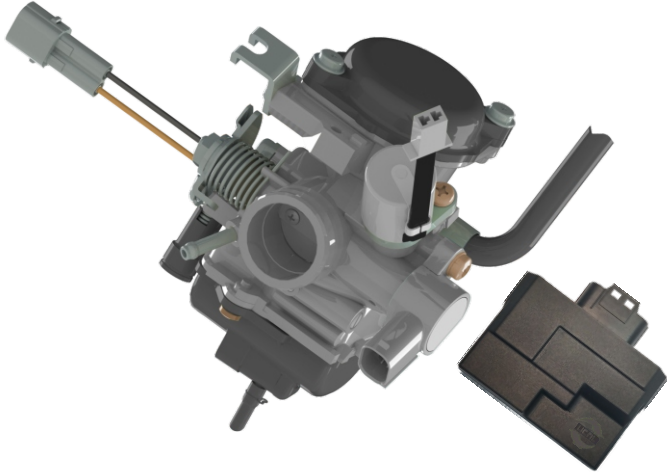
1.0L to 1.5L Engine ( Pass Car & CV )

### SPECIFICATIONS (CAST IRON OIL PUMP)

Flow rate	: 20 to 60 lpm
Pressure	: 1 to 10 Bar
Efficiency	: 90 to 95% at rated engine speed
Noise level	: <1.0 dB
Working temperature	: -30°C to 140°C



# e-Carb<sup>TM</sup> SYSTEM



## PIONEERING BSVI COMPATIBLE ELECTRONIC INJECTION SYSTEM

### SALIENT FEATURES

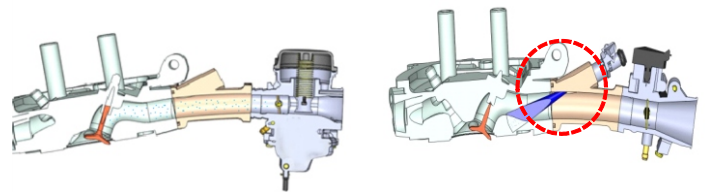
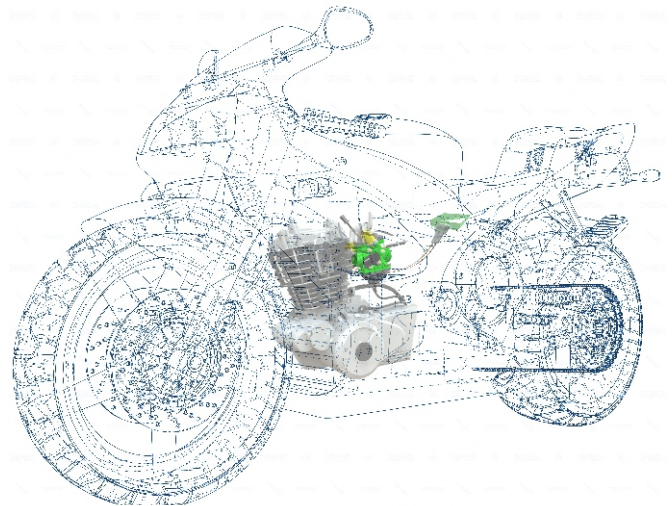
- ✓ Technologically advanced & robust solution
- ✓ BS VI emission norms Capable
- ✓ Closed loop operation
- ✓ OBD-1 Compliance
- ✓ Temperature compensation for easy startability
- ✓ CAN or K-Line communication
- ✓ Reduced maintenance cost compared to FI system - can be serviced by any road side mechanic
- ✓ Fewer system components compared to FI, fewer failure modes & reduced parasitic power consumption
- ✓ No minimum fuel requirement

### VEHICLE APPLICATION

- ✓ 2 Wheelers Class 1 (<150cc)
- ✓ 3 Wheeler (passenger & load carrier)
- ✓ Quadricycle & Urban mobility



[ucal.com](http://ucal.com)



e-Carb<sup>TM</sup>

FI

Better Homogeneous Mixture  
No Wall-Wetting



# THROTTLE

## VALVE ASSEMBLY



### ETV / ITV

#### SALIENT FEATURES

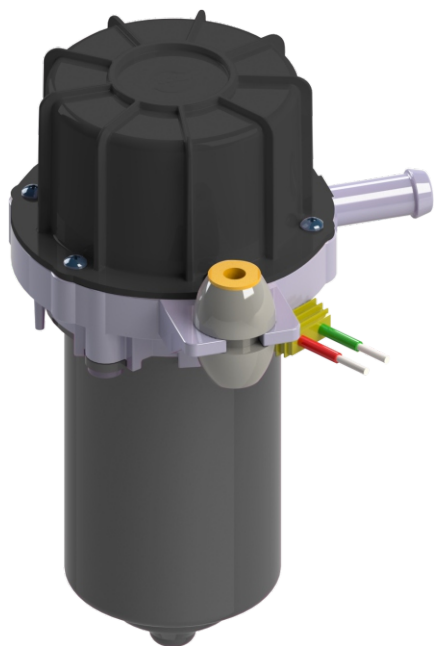
- ✓ Modular Design with standardised parts
- ✓ Quick response characteristics
- ✓ Unique high resolution position sensing with redundancy
- ✓ DC motor Drive - Low current consumption and High durability
- ✓ Analog or PWM or SENT configuration Output is feasible
- ✓ Flexible program for angular excursion
- ✓ Minimized linearity and synchronization error

#### SPECIFICATIONS

Throttle body controls the airflow into the engine based on driver's demand.

Bore Size: 28 to 68 mm

# ELECTRIC VACUUM PUMP



## SALIENT FEATURES

- ✓ Highly efficient PMDC motor
- ✓ High pump efficiency and low power consumption
- ✓ Increased service life
- ✓ Less noise
- ✓ Generates vacuum only when required

## BENEFITS

Reduced Parasitic loss and reduction in BSFC and CO2 emissions

Item	UEVP 001 (5cc)	UEVP 002 (10cc)	UEVP 003 (15cc)	UEVP 004 (25cc)
Operating Temperature	-40-C ~ +120-C	-40-C ~ +120-C	-40-C ~ +120-C	-40-C ~ +120-C
Operating Voltage	6 ~ 16 V	6 ~ 16 V	6 ~ 16 V	6 ~ 16 V
Rated Voltage	12 V	12 V	12 V	12 V
Continuous Current	7.5 A	14 A	23 A	23 A
Vacuum Tank Size	3.2 l	4.0 l	5.0 l	5.0 l
Vacuum Performance (50% from ambient Pressure)	4.8 sec	6 sec	8 sec	8 sec
Protection Class	IP68	IP68	IP68	IP68
Weight	890 g	1600 g	1850 g	1900 g
EMC Condition	Class C	Class C	Class C	Class C

## SUPPLEMENTARY NEEDS

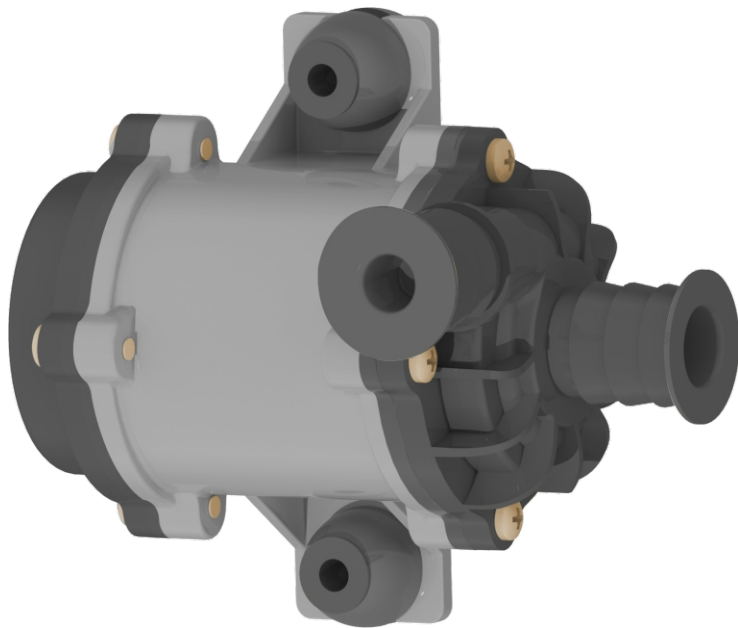
- ✓ Controlling Heating and Cooling function
- ✓ Waste Gate Actuator
- ✓ Central Locking
- ✓ Cruise Control



ucal.com



# ELECTRIC COOLANT PUMP



## SALIENT FEATURES

- ✓ Highly efficient BLDC motor
- ✓ High pump efficiency and low power consumption
- ✓ Sealed pump enclosure
- ✓ Good thermal and corrosion property
- ✓ Electronically commutated for quick response
- ✓ Increased service life
- ✓ Less noise
- ✓ Delivers coolant flow as demanded

## BENEFITS

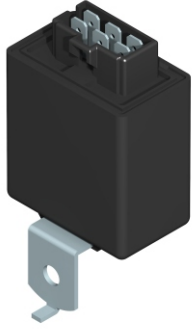
Reduced Parasitic loss and reduction in BSFC and CO2 emissions

Item	UC 1	UC 3	UC 4	UC 5
Power consumption	4.2 W	48 W	84 W	144 W
Input Voltage	12 V	12 V	12 V	12 V
Current (Max)	0.3 A	6 A	8 A	9 - 12 A
Flow rate	4 lpm	20 (12~25) lpm	30 (30~40) lpm	40 (40~60) lpm
Pressure	0.5 Bar	0.6 Bar	0.8 Bar	1 Bar
Pump Assembly Efficiency (Motor + Pump)	45 ~ 50 %	45 ~ 50 %	45 ~ 50%	45 ~ 50 %
Operating Temperature	-20 ~ 120 -C	-20 ~ 150 -C	-20 ~ 150 -C	-20 ~ 150 -C
Protection Class	IP57	IP 68	IP 68	IP 68
Protection Function	-	Dry-run protection, Stall protection, Over Voltage, Over Current and Over Temperature Protection, Short Circuit Proof		
Interface	-	PWM	PWM	PWM
Motor Type	Shaded Pole	3-phase BLDC	3-Phase BLDC	3-Phase BLDC

## SUPPLEMENTARY NEEDS

- ✓ Turbo charging cooling
- ✓ Power Electronics cooling
- ✓ EGR cooling
- ✓ Auxiliary heating & Residual heat extractions
- ✓ Waste Heat Recovery

# FLASHERS



## SALIENT FEATURES

- ✓ Designed for maximum current load to power the turn & emergency signals only
- ✓ Controller /ASIC based design
- ✓ Available in 3 , 4 & 8 pin configuration in 12 & 24 V
- ✓ Double flash indication for lamp failure
- ✓ Short circuit protection

## SPECIFICATIONS

- ✓ Operating Vtg : 12 & 24V
- ✓ IP level : IP 65
- ✓ Duty Cycle : 40 – 75 %
- ✓ Working temperature : -20°C to 90°C
- ✓ Flash rate : 60 - 120 C/M ( Normal) > 140 C/M ( Hazard)

# WIPER TIMER CONTROLLERS

## SALIENT FEATURES

- ✓ Designed to directly drive the wiper motor
- ✓ Relay functions as a switch and energizes circuits as needed
- ✓ Continuous ,Intermittent and wash mode timer function
- ✓ Wide operating voltage range .



## SPECIFICATIONS

- ✓ Operating Vtg : 8.5 to 16 V
- ✓ Operating Load Current : 15A max
- ✓ IP level : IP 65
- ✓ Working temperature : -20°C to 90°C



[ucal.com](http://ucal.com)



# FLOATLESS FUEL

## LEVEL SENSOR



### SALIENT FEATURES

- ✓ Based on the principle of capacitance sensing with float less design
- ✓ Simple structure , easy to install & maintain
- ✓ Low operating cost & wide application range
- ✓ Thermal correction for automatic compensation based on ambient temperature

### SPECIFICATIONS

- ✓ Operating Principle : Capacitive
- ✓ Measurement Accuracy : 5 %
- ✓ Over voltage protection : Yes
- ✓ Output signal : Analog
- ✓ Working temperature : -20°C to 90°C

# ENGINE

## CONTROL UNIT



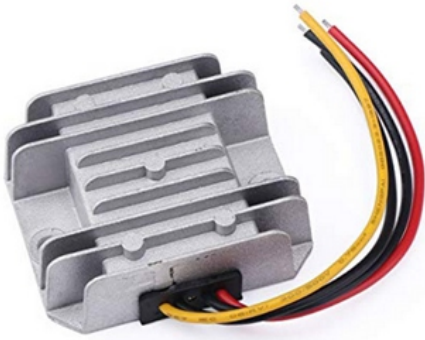
### SALIENT FEATURES

- ✓ Core component for the engine management system
- ✓ Manages various functions such as fuel supply, air management, fuel injection, ignition & exhaust gas treatment
- ✓ Controller based design along with various peripheral sensors

### SPECIFICATIONS

- ✓ Operating Vtg : 12 V
- ✓ Type : DC
- ✓ Over voltage protection : Yes
- ✓ Working temperature : -20°C to 125°C

# DC-DC CONVERTER



## SALIENT FEATURES

- ✓ Converts one voltage level into another
- ✓ Provide isolation
- ✓ Helps in reducing the battery size

## SPECIFICATIONS

- ✓ Output voltage : 12 V
- ✓ Input voltage : 48V, 60V & 72 V
- ✓ Current : 5A to 10A
- ✓ Wattage : 60W onward
- ✓ Working temperature : -20°C to 90°C

# MOTOR CONTROLLER



## SALIENT FEATURES

- ✓ Converts one voltage level into another
- ✓ Provide isolation
- ✓ Helps in reducing the battery size
- ✓ Available in various ranges

## SPECIFICATIONS

- ✓ Operating Vtg : 550V to 750V DC
- ✓ Rated voltage : 650V VDC
- ✓ Peak load : 5KW
- ✓ Working temperature : -20°C to 50°C
- ✓ Frequency : 100Hz



ucal.com

# USB CHARGER



## SALIENT FEATURES

- ✓ 5V USB charger
- ✓ Intelligent charging profile
- ✓ Compatible with USB 2.0 port
- ✓ Reverse voltage & short circuit protection

## SPECIFICATIONS

- ✓ Operating Vtg : 12 V
- ✓ Output current : Continuous 2.4 A max
- ✓ IP level : IP 67 with mounting cap
- ✓ Type : DC
- ✓ Working temperature : -10°C to 85°C

# DIGITAL CLUSTER

## SALIENT FEATURES

- ✓ Configurable smart display
- ✓ More information can be displayed
- ✓ Add up to the overall look of the vehicle



## SPECIFICATIONS

- ✓ Input voltage : 8 V to 16V
- ✓ IP level : IP 67
- ✓ Communication : CAN
- ✓ Working temperature : -10°C to 85°C
- ✓ Display type : 5 " TFT/ LCD

# REVERSE SPEED

## MODULE



### SALIENT FEATURES

- ✓ Controller based design
- ✓ High dB sound for better intimation
- ✓ Enhance vehicle & others safety

### SPECIFICATIONS

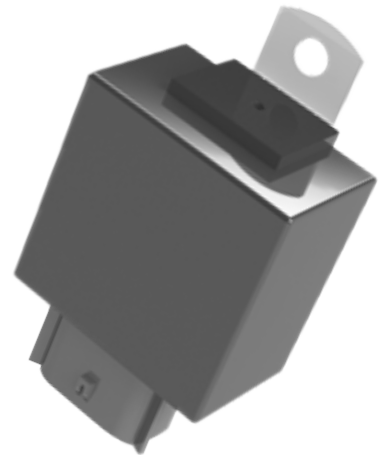
- ✓ Operating Vtg : 10 V to 16V
- ✓ Sound level : 100dB +/- 5dB at 30 cm
- ✓ IP level : IP 65
- ✓ Type : Piezo intermittent
- ✓ Working temperature : -10°C to 85°C

# ENGINE SHUTOFF

## CONTROLLER

### SALIENT FEATURES

- ✓ Controller based design
- ✓ Enhance vehicle & others safety
- ✓ Shut off engine if driver seat is empty



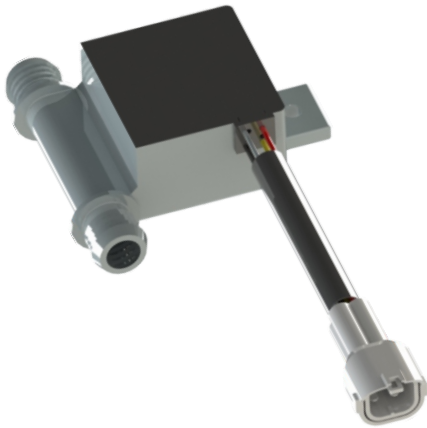
### SPECIFICATIONS

- ✓ Operating Vtg : 10 V to 16V
- ✓ Sound level : 90dB +/- 5dB at 30 cm
- ✓ Sound source : Piezo intermittent
- ✓ Working temperature : -10°C to 85°C
- ✓ IP level : IP 65



ucal.com

# VACUUM SWITCH



## SALIENT FEATURES

- ✓ Senses the air vacuum
- ✓ Hardware based digital output
- ✓ Tolerance in threshold levels within 10%

## SPECIFICATIONS

- ✓ Operating Vtg : 10 V to 16V
- ✓ IP level : IP 67
- ✓ Working pressure range : 400mmHg to 600 mmHg
- ✓ Working temperature : -20°C to 1255°C

# CRUISE CONTROLLER

Cruise control is a feature that helps reduce such fatigue drivers would feel while driving a long distance. The system imitates the way human drivers drive.

## SALIENT FEATURES

- ✓ Reduce driver fatigue
- ✓ System imitates the way human drivers drive
- ✓ Actuator to control the throttle & helps your vehicle continue cruising at the same speed

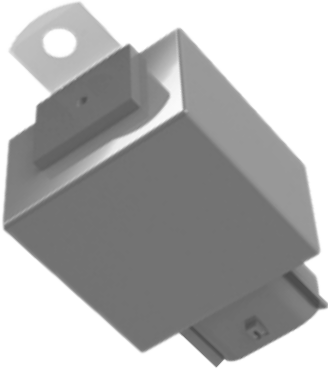


## SPECIFICATIONS

- ✓ Operating Vtg : 12 V
- ✓ Working temperature : -20°C to 90°C
- ✓ IP level : IP 65

# GO TO HOME

## MODULE



In this feature, the car's headlights remain 'on' when the driver either unlocked the vehicle via the key or switched the ignition 'off'

### SALIENT FEATURES

- ✓ Gives illumination after locking vehicle
- ✓ Energy efficient & reduces battery load
- ✓ Lamps are on only for limited duration

### SPECIFICATIONS

- ✓ Operating Vtg : 12 V
- ✓ Working temperature : -20°C to 90°C
- ✓ On time : 30 Sec

# LIGHTING

## CIRCUITS

Powerful Led base headlamp & side indicator.



### SALIENT FEATURES

- ✓ Long lasting , very high service life compared to other types of headlamps
- ✓ Energy efficient & very little maintenance
- ✓ Available for DRL , Headlamp & side indicators
- ✓ Improves aesthetical look

### SPECIFICATIONS

- ✓ Operating Vtg : 12 V
- ✓ Working temperature : -20°C to 90°C
- ✓ Input current : > 1 A



[ucal.com](http://ucal.com)

# HOOTER/BEEPER



Hooters are designed in such a way that they can be utilized in the most sensitive zone of human auditory system. The pitch of these systems can also be adjusted to.

## SALIENT FEATURES

- ✓ Widely used in vehicles for reverse indication
- ✓ Controller based design
- ✓ Sound level – 90dB

## SPECIFICATIONS

- |                          |               |                       |                 |
|--------------------------|---------------|-----------------------|-----------------|
| ✓ Operating Vtg          | : 8.5 to 16 V | ✓ Working temperature | : -20°C to 90°C |
| ✓ Operating Load Current | : >1A max     | ✓ Sound Level         | : 90dB          |

# DIGITAL HORN

Electronic horns are used on vehicles to give out warning signals generated by an electronic circuit. A solenoid is magnetized & demagnetized to produce the fundamental frequency & cause the diaphragm to vibrate.

## SALIENT FEATURES

- ✓ High Tone & low tone
- ✓ No mechanical tuning required
- ✓ Better life expectancy
- ✓ Pleasing & particular sound



## SPECIFICATIONS

- |                 |                 |                       |                 |
|-----------------|-----------------|-----------------------|-----------------|
| ✓ Operating Vtg | : 12 V          | ✓ Duty cycle          | : 60 – 80 %     |
| ✓ Frequency     | : 400 to 500 Hz | ✓ Working temperature | : -20°C to 90°C |
|                 |                 | ✓ Sound Level         | : 100dB         |

