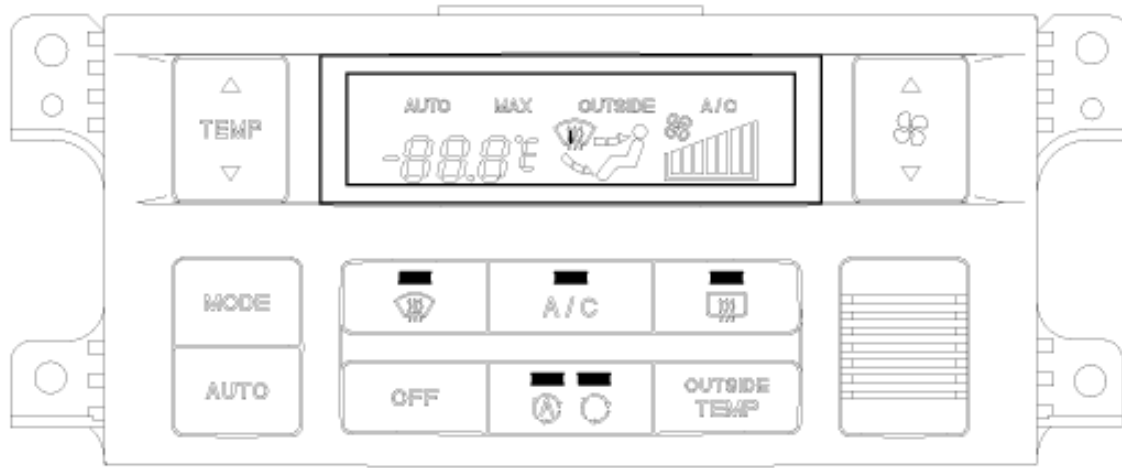




DESCRIPTION



BUTTON CONTROL AND OPERATION LOGIC

1. All buttons should be back-up.
2. Push the button, then the operation sound is made for 0.1 sec. When a S/W is selected, and operation sound is made as well).

NO	BUTTON	BUTTON FUNCTION	DISPLAY	SYSTEM OPERATION
1	TEMP	TEMP UP/DOWN	Set temperature: Display	<ol style="list-style-type: none"> 1. Control the discharge air temperature by adjusting the mixture ratio of cold & hot air with the TEMP DOOR. 2. Whenever press the SWITCH, temperature is changed 0.5°C up/down each time. (Each time the operation sound is made for 0.1 sec.) 3. Set 17°C (62°F) as MAX COOL, 32°C (90°F) as MAX HOT. 4. When the switch is turned ON from OFF, the set temperature is displayed as the same before OFF. 5. When changing the set temperature from 17.5°C to 17°C or from 31.5°C to 32°C, the operation sound is made. 6. At 17°C, if the temperature is set below than 17°C or at 32°C , if it is above than 32°C , the operation sound is made 5times at an interval of 0.15 sec.

				<p>7. When pushing the TEMP button several times, the set temperature is shifted to another step at an interval of 0.7sec., When engaging the button continuously (keep pushing), only the first shift takes 0.7 sec. but the next shifts take 0.3 sec.</p>
				<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -OFF: SYSTEM OFF -TEMP: SET TEMPERATURE UP/DOWN
2	AUTO	AUTO CONTROL	"AUTO": Display	<p>1. Automatically control the following items corresponding to the set temperature.</p> <ul style="list-style-type: none"> •TEMP DOOR •MODE DOOR •INTAKE DOOR •BLOWER FAN SPEED •A/C <p>2. When the AUTO mode is off, the word AUTO should not appear.</p> <p>3. After off the AUTO mode, the system is automatically controlled except for the manually selected SW.</p>
				<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -OFF: SYSTEM OFF -FAN UP/DOWN: BLOWER FAN SPEED MANUAL CONTROL -MODE: DISCHARGE MODE MANUAL CONTROL -A/C: A/C ON/OFF MANUAL CONTROL -FRE.: FRE. MODE MANUAL CONTROL -REC.: REC. MODE MANUAL CONTROL -DEF.: DEF. MODE MANUAL CONTROL, A/C ON, FRE.
3	AMB	Ambient temperature display	<ul style="list-style-type: none"> •"AMB": Display •Ambient temperature: Display •The other signals: OFF 	<p>1. System is operated as the same before the AMB SW turned on.</p> <p>2. When the AMB SW is pushed, the other signals are not appeared but the word AMB and the ambient temperature are displayed for 5 sec., and then the display become the same as the AMB SW is not pushed.</p>
				<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -AMB: If the AMB SW is pushed once more when the ambient temperature is displayed, the ambient temperature does not appear and the display become the same as the AMB SW is not pushed. -OTHER SWITCHES: If the other switch is pushed except for REARDEF and in-car & ambient /AQS, ambient temperature does not appear and the pushed switch is displayed.
4	A/C	A/C ON/OFF CONTROL	<ul style="list-style-type: none"> •"A": Display/OFF •"AUTO": OFF 	<p>1. A/C ON/OFF</p>

				<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -A/C: A/C ON/OFF MANUAL CONTROL -OFF: SYSTEM OFF -AUTO: AUTO MODE AUTOMATIC CONTROL
5	MODE	<p>MODE DOOR CONTROL</p> <ul style="list-style-type: none"> •VENT •B/L •FOOL •MIX 	<ul style="list-style-type: none"> •"MODE": Display/OFF •"AUTO": Off 	<ol style="list-style-type: none"> 1. Fix the MODE DOOR to one among VENT, B/L, FLOOR and MIX. 2. MODE SW MANUAL CONTROL ORDER : VENT → B/L → FLOOR → MIX → VENT → ... 3. At MIX MODE: MIX LOGIC (MIX, FRE., A/C ON) <p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -DEF: DEF MODE MANUAL CONTROL -MODE: VENT, B/L, FLOOR & MIX (repeat the order) -AUTO: AUTO MODE AUTOMATIC CONTROL
6	DEF	DEF MODE	<ul style="list-style-type: none"> •"DEF": ON •"A/C": Display •REC. IND: OFF •"AUTO": OFF 	<ol style="list-style-type: none"> 1. MODE DOOR: Fix to "DEF" 2. INTAKE DOOR: Fix to "FRE." (REC. can be selected) 3. A/C: ON <ul style="list-style-type: none"> •A/C OUTPUT ON/OFF control: Corresponding to the detected temperature by EVAP SENSOR. •A/C output should be cut off at 3.5°C or below (ambient temperature). (DISPLAY OFF, A/C SELECT SIGNAL OFF) 4. DEF is prior to "MAX HOT/COOL" function. 5. DEF is prior to "MIX MODE" control. <p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -AUTO: ALL SYSTEM AUTOMATIC CONTROL -MODE: DISCHARGE MODE MANUAL CONTROL (DEF Function off) -A/C: A/C ON/OFF MANUAL CONTROL -DEF: Return to the mode before the DEF S/W selection
7	OFF	SYSTEM OFF	LCD: ON	<ol style="list-style-type: none"> 1. BLOWER FAN SPEED OFF 2. A/C OFF 3. TEMP. DOOR: Fix to the mode before OFF 4. MODE DOOR: Fix to the mode before OFF 5. INTAKE CONTROL: Fix to the mode before OFF 6. After "OFF", at REC, REC. S/W ON (NON-AQS type) <ul style="list-style-type: none"> -Shift to FRE. MODE -REC. INDICATOR ON -LCD OFF -OTHERS: OFF 7. After "OFF", at FRE, FRE. S/W ON (NON-AQS type)

				<ul style="list-style-type: none"> -Shift to FRE. MODE -REC. INDICATOR ON -LCD OFF -OTHERS: OFF <p>8. After "OFF", at AQS, AQS/REC. S/W ON (AQS type)</p> <ul style="list-style-type: none"> -Shift to REC. MODE -AQS OFF -REC. INDICATOR ON -LCD OFF -OTHERS: OFF <p>9. After "OFF", AQS ON → AQS LOGIC</p> <p>10. After "OFF", AMB S/W ON</p> <ul style="list-style-type: none"> -OFF: The word "AMB" & ambient temperature displays for 5 sec. and then off.
				<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> •AUTO: AUTO MODE AUTOMATIC CONTROL •BLOWER <ul style="list-style-type: none"> -SPEED: Return to MANUAL LOW -OTHERS: Return to the mode before OFF •A/C <ul style="list-style-type: none"> -A/C ON -OTHERS: Return to the mode before OFF •MODE <ul style="list-style-type: none"> -MODE: The mode before OFF -OTHERS: Return to the mode before OFF •DEF <ul style="list-style-type: none"> -MODE: DEF -A/C ON -INTAKE: FRE. -OTHERS: Return to the mode before OFF •TEMP <ul style="list-style-type: none"> -TEMP: The mode before OFF -OTHERS: Return to the mode before OFF
8	REC. (NON-AQS type)	REC. MODE	<ul style="list-style-type: none"> •IND ON •"AUTO" display 	1. When operating the REC. S/W from FRE. MODE, fix the INTAKE DOOR to REC. MODE or when operating the REC. S/W from REC., fix the INTAKE DOOR to FRE. MODE.
		FRE. MODE	<ul style="list-style-type: none"> •IND OFF •"AUTO" display 	<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> -REC.: FRE./REC. MODE CONTROL -OFF SW: ALL MODES (POSSIBLE TO MANUALLY SELECT) -AUTO: AUTOMATIC CONTROL (FRE. or REC.)

9	FAN UP/ DOWN	BLOWER FAN SPEED UP/ DOWN	FAN IND ON/ OFF	<ol style="list-style-type: none"> 1. BLOWER MOTOR's rotation speed is controlled by the current variation of the POWER TRANSISTOR. 2. At AUTO MODE, if FAN is operated UP/DOWN, the FAN SPEED is UP/DOWN on the basis of the present FAN LEVEL. 3. At OFF, if the other SW except for "FAN" is turned ON, the FAN SPEED is gradually increased from LOW to TARGET SPEED 4. Fan speed level and voltage <ul style="list-style-type: none"> • AUTO AIR CONDITIONER: No level (4.5V - B+) • AUTO HEATER: No level (4.5V - B+) • MANUAL FAN SPEED: 7th level (3.8V - B+) 5. The first shift to another step takes 0.7 sec. If the button is continually engaged, the first shift takes 0.7 sec. And then the next ones take 0.3 sec per each. The operation sound is made for 0.1 sec. 6. At MANUAL 7th level when the UP SW is pushed or at MANUAL 1st level when the DOWN SW is pushed, the operation sound is made 5 times at an interval of 0.15 sec. 7. When shifting 6 to 7 level, or 2 to 1 level, the operation sound is intervally made each 0.15 sec.
<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> - AUTO: AUTO MODE AUTOMATIC CONTROL - OFF: SYSTEM OFF - FAN UP/DOWN: BLOWER FAN SPEED MANUAL CONTROL 				
10	DEFOG	Rear glass defogger	DEFOG IND ON/OFF	<ol style="list-style-type: none"> 1. If the DEFOG SW is pushed, the rear glass defogger operation signal is output to the ETACS and the ETACS turns the DEFOG IND on by the HTD input. 2. While operating the rear glass defogger, if DEFOG SW is pushed, ETACS stops operating the rear glass defogger and turns the DEFOG IND off. 3. After operating the rear glass defogger for 15 minutes by ETACS, DEFOG function is automatically off.
<p>OFF SW AND SYSTEM OPERATION</p> <ul style="list-style-type: none"> - DEFOG: Push the second DEFOG SW, DEFOG function is off. 				

SYSTEM CONTROL FEATURES

SIGNAL I/O FOR EACH CONTROL FEATURE

Control item	Input	Output	Remarks
Required discharge temperature control	Auto SW, A/C SW, TEMP SW, INCAR sensor, AMB sensor, Photo sensor, Water temperature sensor, thermo sensor, TEMP actuator.	TEMP actuator	

Mode control	AUTO SW, MODE SW, TEMP SW, DEF SW, Blower SW, OFF SW, INCAR sensor, AMB sensor, Photo sensor, Water temperaturesensor, thermo sensor, Power TR.	Blower motor Power TR HI-blower relay	Blower Switch Manual selection Control in priority
Mode door control	AUTO SW, MODE SW, DEF SW, Blower SW, OFF SW, TEMP SW, INCAR sensor, AMB sensor, Photo sensor.	Mode actuator	
Intake control	AUTO SW, A/C SW, DEF SW, TEMP SW, OFF SW, Intake SW, INCAR sensor, AMB sensor, Photo sensor, Power TR.	Mode actuator	
Compressor control	AUTO SW, A/C SW, DEF SW, TEMP SW, OFF SW, IN-CAR sensor, AMB sensor, Photo sensor.	Compressor relay	

During mode control, the A/C may operate during DEF or MIX mode. In order to enable dehumidification, the driver may select A/C OFF during the A/C on condition.

CONTROL SPECIFICATION

Control item	Control features	Remarks
Required discharge temperature	Required temperature determined by the set temperature and the inputted sensor value.	
Auto control	Required discharge temperature is determined by the set temperature and the inputted sensor value. The feature will use the required discharge temperature to perform the auto control of temp. actuator, mode actuator, intake actuator, blower motor and compressor, and maintain the set temperature stably.	
IN-CAR temperature correction	Upon detecting rapid changes of temperature from the INCAR sensor, it will gradually correct the incar temperature value.	-1°C UP/4sec delay -1°C DOWN/4sec delay
AMB temperature correction	Upon detecting rapid changes of temperature from the AMB sensor, it will gradually correct the ambient temperature value.	-1°C UP/3min delay -1°C DOWN/4sec delay
Photo correction	Upon detecting rapid changes of photo intensity from the PHOTO sensor, it will gradually correct the photo intensity value.	-350 → 1000(W/m ²)/1min delay -350 → 1000(W/m ²)/5min delay
TEMP door control	It does the automatic control to maintain the optimum TEMP door opening (0%-100%). It will be computed by the temperature set and the input signal from each sensor.	The set temperature range 17°C → 32°C, 0.5°C step (62°F → 90°F, 1°F step)

Blower speed	Automatic control of the blower speed. The target value will be computed by the set temperature and the input signal from each sensor. (7 levels may be selected in case of manual selection.)	<ul style="list-style-type: none"> -Auto mode blower low voltage (Manual low voltage: 3.8) -Auto mode heater blower HI speed: 10.6V
Electro-motive mode control	During auto control, it will raise the permitted voltage of blower motor gradually in order to improve comfortability.	6 seconds for shifting LO → MAX
Photo compensation	During auto control, it will compensate the blower level and the discharge temperature according to the photo intensity detected from the PHOTO sensor at VENT or B/L mode. PHOTO compensation will begin after 5 seconds when ignition on.	
Mode door control	<p>Automatic control of air discharge based on the required discharge temperature. It will be computed by the temperature setting and the input signal from each sensor.</p> <p>VENT → B/L → FLOOR → VENT)</p> <p>In case of manual selection (VENT → B/L → FLOOR → MIX → VENT)</p>	<ul style="list-style-type: none"> -At OFF in AUTO mode, MODE door will maintain the AUTO controlcondition. -At OFF in manual mode, MODE door will maintain the manual controlcondition.
MIX mode control (in auto control)	If the ambient temperature is -13°C or less in AUTO mode, discharge mode will be controlled at MIX. (When front window glass is defogged.)	Entering MIX mode, A/C will operate.
INTAKE door control	Auto control of intake mode based on the required discharge temperature that will be computed by the temperature setting and the input signal from each sensor.	<ul style="list-style-type: none"> -Shift to REC when selecting REC button at FRE condition (LED on). -Shift to FRE when selecting FRE button at REC condition (LED off).
INTAKE control at OFF	The intake door will shift to the REC position when switching the system off in auto-condition, and maintain the previous condition at OFF at manual condition.	<ul style="list-style-type: none"> -FRE./REC. manual selection will be enabled at OFF. -REC indicator will come on at OFF at AUTO mode.
Compressor auto control	Control automatically the compressor on/off state corresponding to the set temperatureand the input signal from each sensor.	<ul style="list-style-type: none"> -When selection the AUTO SW, the compressor is controlled to ON/OFF. -When selection the DEF SW, the compressor is controlled to "ON".

Compressor clutch on/off control based on refrigerant temperature	If EVAP sensor temperature is below than 0.5°C, the compressor will be ON and the temperature is 3°C, or higher, with the compressor OFF.	
MAX HOT	When selecting the set temperature 32°C at AUTO mode, MAX HOT will be performed. It will prevail over MIX mode control.	<ul style="list-style-type: none"> -TEMP door: MAX HOT -MODE door: FLOOR mode -INTAKE door: FRE mode -Compressor: OFF -Blower speed: AUTO HI (10.6V)
MAX COOL	When selecting the set temperature 17°C at AUTO mode, MAX COOL will be performed.	<ul style="list-style-type: none"> -TEMP door: MAX COOL -MODE door: FLOOR mode -INTAKE door: REC mode -Compressor: ON -Blower speed: MAX HI
Electromotive heating control	If the set temperature >the in-car temperature by 3°C at B/L or FLOOR in AUTO mode, and the water temperature sensor input is 58°C or less, it will effect the electromotive heating control to prevent outside cold air from flowing toward the feet of passengers.	-Blower speed: Controlled at AUTO LOW (0.5V)
	As the coolant temperature rises, the MODE door will shift to DEF → MIX → AUTO.	<p>Operation release</p> <ul style="list-style-type: none"> •10 minutes after ignition on(In case of temperature sensor fail,it will apply the substitute value, 20°C). •After pressing blower switch when water temperature sensor detection is 58°C or higher •In pressing MODE switch. •In Upon pressing DEF switch.
	MODE: Manual selection is enabled. INTAKE door: At AUTO control or at manual selection mode.	
Blower speed: Manual selection is enabled (No re-entry).		
Electromotive cooling control	In order to prevent hot air from the VENT or B/L in AUTO mode (A/C on mode), the blower speed will be operated at LOW for approx. 9 seconds before entering the AUTO control if the EVAP sensor detection is temperature 30°C or higher.	

MAX HOT	If the above condition is satisfied, electromotive cooling control will operate at any time.	
Air Quality System (AQS)	The AQS system will detect the hazardous elements and odors contained in the air.If the harmful element concentration is higher than standard, the system will output a LOW signal (0V) to the FATC.	-When the initial battery connection and ignition is ON, it will operate at AUTO mode. (AQS will not operate).
	If the concentration is within the standard value, the system will output a HI signal(3V) the FATC.	-When IGN 2 ON, the AQS assembly will be preheated for 34.5 ± 5seconds.During the preheating, AQS will output 0V (ground). (REC mode)
	Corresponding to the signal from the AQS, it will control the INTAKE door as follows to prevent the inflow of harmful gas in FATC :	-IGN 2 ON: It will check circuit break on the AQS assembly's signal line for approx. 7 seconds during the preheating, irrespective to the AQS switch condition.
	Condition : INTAKE door position	-When AQS is selected prior to IGN2 OFF and IGN2 is turned OFF → ON: AQS indicator will come on, and the system will operate at AQS mode. (Store the previous condition before IGN 2 OFF)
	LOW : REC	
HI : FRE		
Initialization Upon battery-on	When supplying the initial power, it will operate in the initial condition.	-When the initial ignition ON after battery connection, the system will operate at the set temperature 25°C and at AUTO mode.
Memory	When removing the ignition key, it will store FATC's operating condition.	-When IGN ON after IGN OFF during FATC operation, the system will operate at the previous before the ignition off.