

Written in Jun, 2008

ACU User's Manual

**ACU (ATS CONTROL UNIT)
MODEL : MP3**

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ENGINE GENERATOR CONTROL ENTERPRISE
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Cautions for your safety

1. Please be well informed of user's manual and drawings of the product in order to operate safely.
2. Please follow all safety instructions to prevent potential accidents and dangers.
3. There are two types of cautions; "Warning" and "Caution", where each meaning are as follow:

 Warning	Potential injury or death may arise in case of violation of safety instructions
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 Caution	Potential injury or product damage may arise in case of violation of safety instructions
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4. Meanings of picture signals appear in the manuals are as follow:

	Please be careful as it may cause product damage
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	Please be careful as it may cause electrocution
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5. Please keep this manual close to the product

 Warning	<ol style="list-style-type: none"> 1. Please do not perform wiring work when power is on or in operation as it may cause electrocution. 2. Please do not disassemble the product even when power is off, as the charging current inside the product may still cause electrocution. 3. Please do not touch with wet hands as it may cause electrocution. 4. Please do not touch when sheath of electric wire is damaged as it may cause electrocution. 5. Please do grounding of electric wire to prevent electrocution.
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 Caution	<ol style="list-style-type: none"> 1. Please permit a correct power supply to prevent product damage and fire 2. Please be sure no foreign substances enter into the product as they may cause short circuit or fire. 3. Please connect wire with correct load to input and output sockets to prevent product damage and fire. 4. Please connect wire as instructed to prevent product damage and fire. 5. Only technicians or properly trained personnel may use this product as irrational use of this product may cause injuries or damages to the product and devices connected to the product. 6. As this product comprises of electrical components, please separate the product before performing the test which requires high voltage such as inner voltage test or insulation resistance test. 7. Please use fuse and electric wire with correct capacity to prevent fire. 8. Please hold this product firmly as it is used for engine generator with high vibration. 9. Please make sure there are no untangled parts before installation.
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1. Functions and Features

- 1.1. Beautiful design. Well-designed to manipulate easily
- 1.2. ETS can be controlled by one device(ACU) so that less space is occupied.
- 1.3. Indication of
 - commercial power and generator power
 - insertion state
 - 3 phase detection and absent phase of commercial power
- 1.4. When commercial power is abnormal(outage or phase-absent), engine start contact is prepared.
- 1.5. SEMI-AUTO function : When one of the commercial power or generator power is abnormal during the AUTO mode, switch is transferred to the normal power source even before time delay passes.
- 1.6. TEST mode is available both in AUTO or MANU mode.
- 1.7. Solenoid anti burnt down design of ETS : If ETS is not transferred after transfer output during AUTO or MANU mode, buzzer alarms and transfer indication lamp blinks.(If ATS is manually transferred, it normally operates)



Caution If you want to manually manipulate ATS using lever, please block the power supply into controller(ACU).

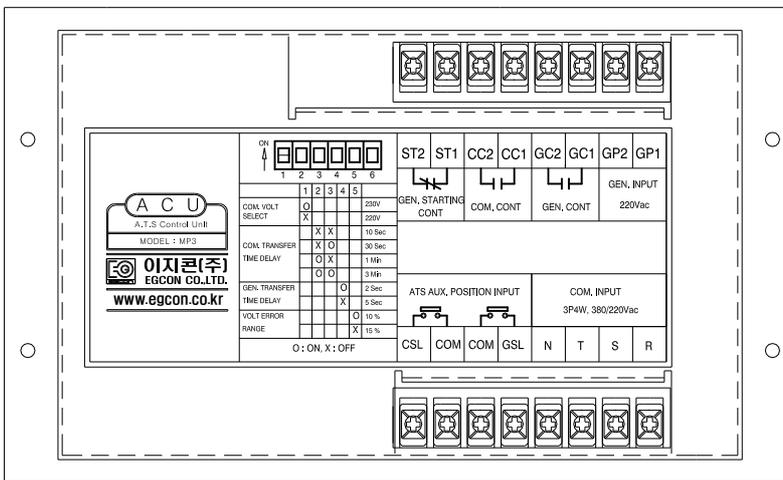
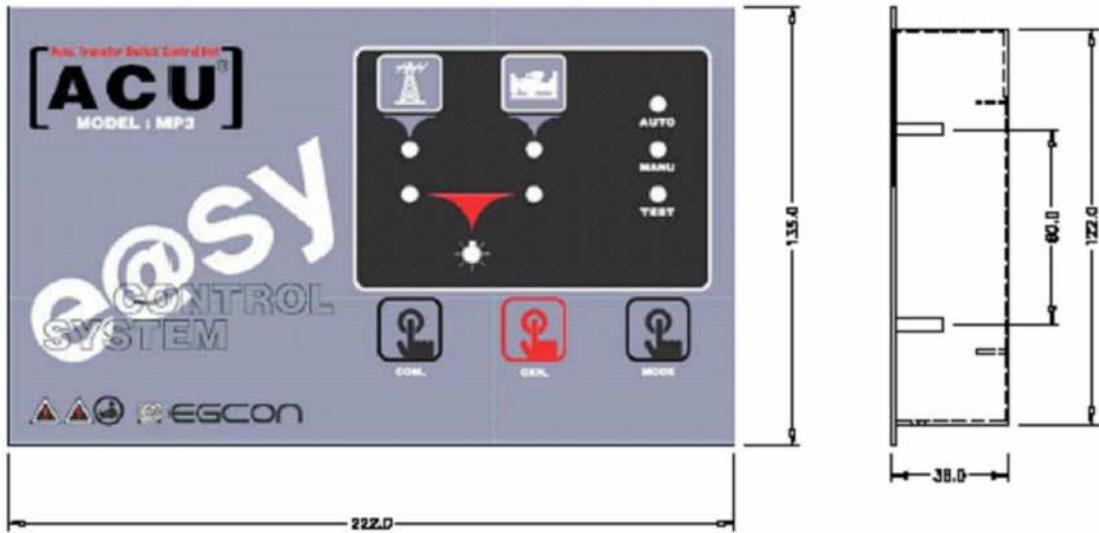
If you do not block the power supply into controller during the manipulation of ATS, controller's unexpected operation can cause injuries making lever pop. If you check ATS or manually manipulate it, please block the power supply.

2. Specifications

- 2.1. Power Input : 220 Vac
- 2.2. Commercial Power Input : 3P4W, 380/220Vac, 50/60 Hz
- 2.3. Generator Power Input : 1P, 220Vac, 50/60 Hz
- 2.4. Contact Capacity of Transfer Output : 250Vac, 10 A (Dry Contact)
- 2.5. Assistant Contact Capacity When Commercial Power Fault : 250Vac, 10A(Dry Contact)
- 2.6. Attached on the front

3. Structure

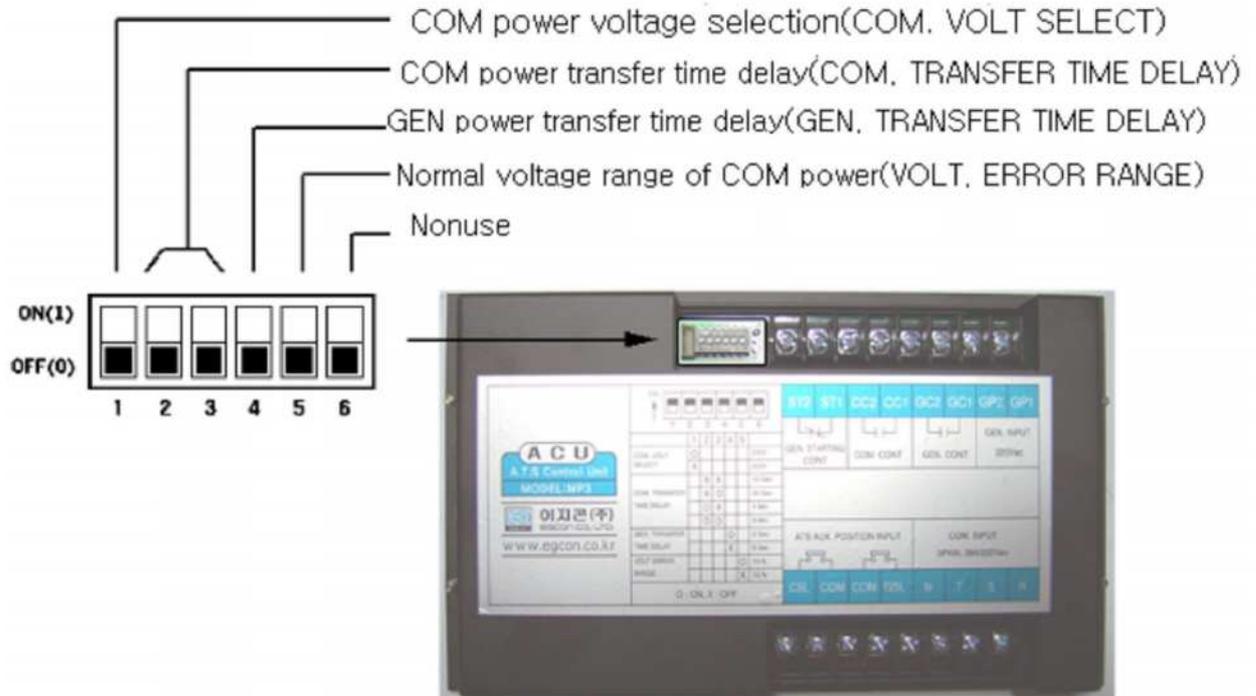
- 3.1. Dimension : W222, H135, D36 (mm)
- 3.2. Cut-out : W195, H125 (mm)
- 3.3. Mounting Holes : W210, H60 (mm), 5 ϕ -4 Holes
- 3.4. Outward



4. Indication Lamps and Switches

Name	Function	LED Color
COM power Lamp	Turns on when commercial power is normally input	GREEN
GEN power lamp	Turns on when generator power is normally input	GREEN
Transferred to COM	Turns on when ATS is transferred to commercial power	RED
Transferred to GEN	Turns on when ATS is transferred to generator power	RED
AUTO	Turns on during automatic mode	GREEN
MANU	Turns on during manual mode	GREEN
TEST	Turns on during test mode	RED
Button transferring to COM	Transferred to commercial power during MANU mode	
Button transferring to GEN	Transferred to generator power during MANU mode	
Button changing to operation mode	Selecting AUTO, MANU, TEST (press over 10 sec) mode	

5. Setting DIP SWITCH



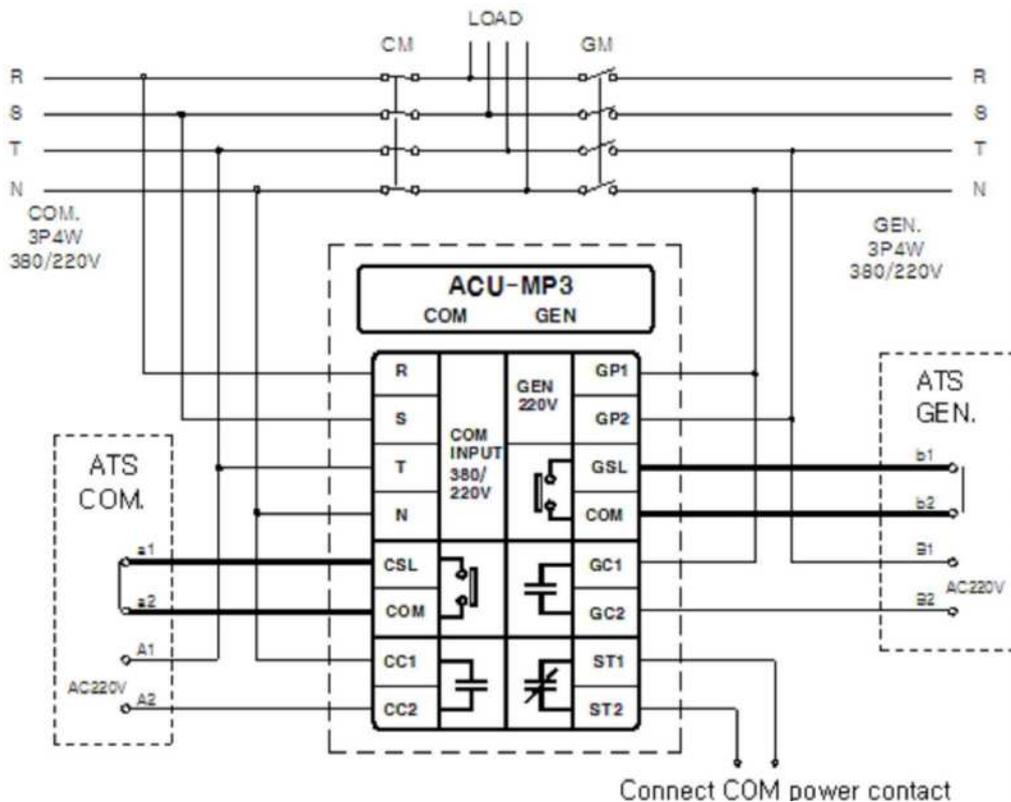
Function	SWITCH No.					Setting
	1	2	3	4	5	
COM. VOLT SELECT	ON					220 Vac (L-N)
	OFF					230 Vac (L-N)
COM TRANSFER TIME DELAY		OFF	OFF			10 Sec
		OFF	ON			30 Sec
		ON	OFF			1 Min
		ON	ON			3 Min
GEN TRANSFER TIME DELAY				ON		2 Sec
				OFF		5 Sec
VOLT ERROR RANGE					ON	10%
					OFF	15%

- 5.1. COM VOLT SELECT : Selecting commercial input voltage, inter-phase voltage(L-N)
- 5.2. COM TRANSFER TIME DELAY : Transfer time delay to commercial power when commercial power is normal during the AUTO mode.
- 5.3. GEN. TRANSFER TIME DELAY : Transfer time delay to generator power when generator power is normal during the AUTO mode.
- 5.4. VOLT ERROR RANGE : Range of Normal Commercial Power Voltage(If 195~245Vac is input during 220V input and setting for 10%)

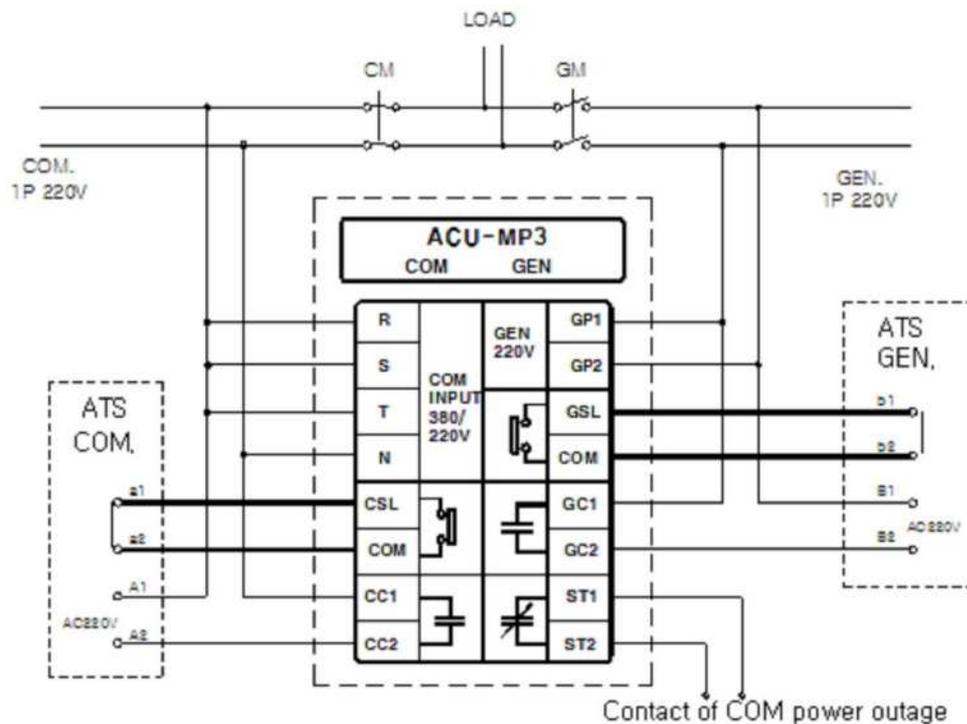
6. Input/Output Terminals

Terminal Name	Description	Rating
COM	R	Input terminal of COM power R phase
	S	Input terminal of COM power S phase
	T	Input terminal of COM power T phase
	N	Input terminal of COM power N phase
GP1, GP2	Input terminal of GEN power	1P 220Vac 10A
CSL, COM	Assistant contact input of COM power	Dry contact(Do not connect power supply)
GSL, COM	Assistant contact input of GEN power	Dry contact(Do not connect power supply)
CC1, CC2	Insertion contact of COM	250Vac 10A (Dry contact)
GC1, GC2	Insertion contact of GEN	250Vac 10A (Dry contact)
ST1, ST2	When COM power is out or has fault(phase-absent), contact is CLOSE . When COM power is normal and assistant contact of ATS is on the COM power, contact is OPEN.(UVR contact of COM power)	250Vac, 10A (Dry contact)

7. Preparation Before Use



[Circuit Diagram 1]



[Circuit Diagram 2]

Before wiring, please block all the power supplies into ATS.

- 7.1. Please connect ATS to ACU-MP3 according to [Circuit Diagram 1].(If connecting COM power with 1P 220Vac, please connect according to [Circuit Diagram 2].
- 7.2. Please supply power to ATS after checking whether COM power and GEN power is correctly wired.

8. MANU Operation Test

- 8.1. When power is applied, ACU operates at the latest selected mode.
- 8.2. When commercial power and generator power is applied, lamps of both powers turn on.
- 8.3. If commercial power lamp blinks, it is phase-absent or low voltage so that it needs to be checked.
- 8.4. If commercial power is normal and ATS is on the commercial power's side, UVR contacts(ST1, ST2) of commercial power get OPEN.
- 8.5. Using generator power selection switch, transfer ATS to generator power's side.
- 8.6. If ATS is transferred to generator power, insertion lamp of generator power turns on.
- 8.7. Using commercial power selection switch, transfer ATS to commercial power's side.
- 8.8. If ATS is transferred to commercial power, insertion lamp or commercial power turns on.

9. AUTO Operation Test

- 9.1. Using MODE switch, set operation mode for AUTO mode.
- 9.2. Make commercial power or one of the three phases OFF.
- 9.3. If power of phase T is OFF, all lamps of ACU gets OFF; if phase R or S is OFF or low voltage occurs, indication lamp blinks.

- 9.4. UVR contacts(ST1, ST2) of commercial power gets CLOSE.
- 9.5. Generator power lamp turns on when generator power is applied.
- 9.6. If generator power is normal, ATS is transferred to generator power's side after set time delay and insertion lamp of generator power turns on.
- 9.7. If commercial power is applied, lamp of commercial power turns on and after set time delay, ATS is transferred and insertion lamp of commercial power turns on.
- 9.8. UVR contacts(ST1, ST2) of commercial power is OPEN.

10. TEST Operation Test

- 10.1. TEST mode is available during both AUTO and MANU mode.
- 10.2. While commercial power is normal and ATS is transferred to commercial power, if MODE switch is pressed over 10 sec, TEST LAMP turns on.
- 10.3. If TEST mode is set, UVR contacts(ST1, ST2) of commercial power are CLOSE.
- 10.4. If generator power is not applied within 10 sec, mode is changed to precious mode after buzzer alarms.
- 10.5. Lamp of generator power turns on when generator power is applied, and ATS is transferred to generator power's side after time delay.
- 10.6. When ATS is normally transferred to generator power, ATS will be transferred to commercial power after time delay for transferring to commercial power.
- 10.7. Insertion lamp of commercial power turns on.
- 10.8. TEST mode terminates and mode changes to precious mode.

11. Problem Causes and Solutions

Symptom	Cause	Solution
Indication lamps turn on when ATS is transferred to the reverse and ATS is not transferred when transfer button is pressed.	Assistant contact of ATS is reversely connected.	Correct wiring according to circuit diagram.
Lamp of commercial power flickers.	One of the three phases of commercial power is absent or there is a phase that is not connected.	Check whether the voltage of each phase is normal and there is absent wiring.
Buzzer keeps alarming and transfer indication lamp flickers.	Contact of ATS is not completely transferred even after controller's trial to transfer	Transfer ATS mechanically using lever after blocking power supply to the controller and then connect power to the controller.
	Assistant contact of ATS is not connected correctly	Correct wiring according to circuit diagram.

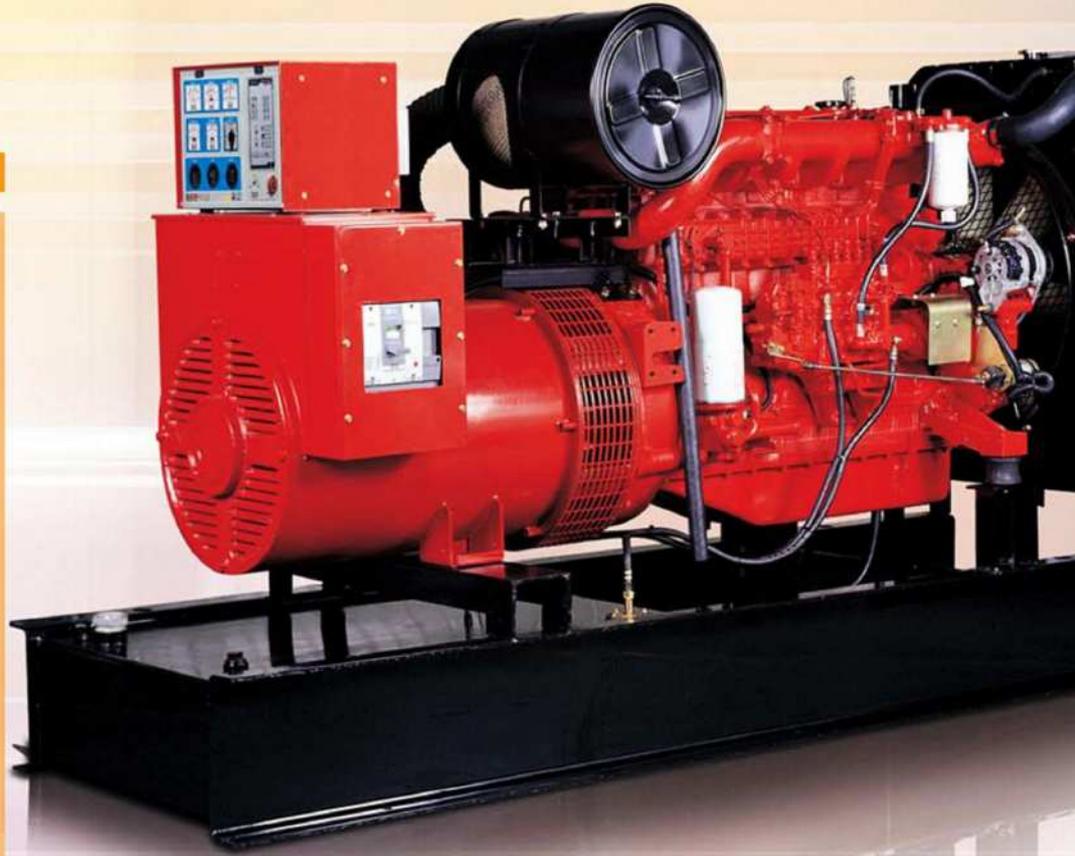
ENGINE, GENERATOR CONTROL ENTERPRISE

EGCON[®]

엔진, 발전기 제어 전문기업

PRODUCTS ITEM

- AVR / 자동전압조정기
- ABC / 자동발전기충전기
- GCU / 발전기제어장치
- ECU / 엔진제어장치
- ESD / 엔진속도검출기
- EPD / 엔진보호장치
- SCR / 동기검출기
- BCU / ACB 제어장치
- ACU / ATS 제어장치
- MPU / 속도검출센서
- GCP / 발전기 운전반
- ECP / 엔진 운전반
- ATS / ATS 운전반
- FGP / 별치형 운전반



AVR
MODEL : 635/631



ABC
MODEL : SMP



ABC
MODEL : SMF



ECU
MODEL : DG1



GCU
MODEL : MP2



DMM
MODEL : 961



ACU
MODEL : MP3



ETS
MODEL : Y, B TYPE



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