

OIL-FREE SCREW COMPRESSORS

# AIR ZEUS

**SDS-U SERIES**

HITACHI OIL-FREE  
SCREW COMPRESSOR

*AIRZEUS*  
*SDS-U SERIES*



# Structure of AIRZEUS SDS-U

## ■ Providing lower noise level Discharge Silencer

This silencer reduces irritating high-frequency noise by reducing the pressure pulsations of the compressor air.

## ■ Multilayer configuration Air Filter

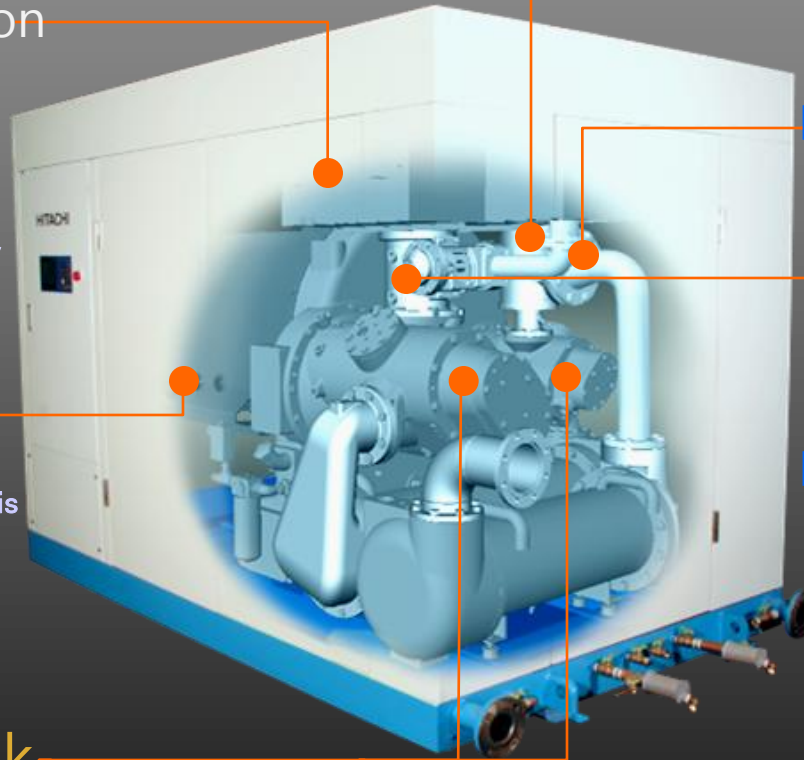
Two types of unwoven chemical fiber, combined with a three-dimensional construction, are used for air filter. Dust can be captured 3-dimensionally with the multilayer construction.

## ■ Main Motor With improved reliability

A totally enclosed flange-type motor is used for the main motor to improve reliability.

## ■ New-Type Air Block Improving efficiency and saving energy

The overhaul maintenance interval has been greatly extended by proper design of air block.



## ■ Environment-friendly Oil Capturing System

OMCS (Oil Mist Capturing System) is commonly equipped in this series. It collects oil mist from the gear casing (oil tank).

## ■ Check Valve

Supporting longer product life  
This high durability check valve is used to prevent the backflow of air. The valve construction with a reduced number of moving and sliding parts assures longer life and higher reliability.

## ■ Highly durable Capacity Control Valve

A simple construction that drives the intake valve by the hydraulic piston is adopted. Its excellent durability contributes to energy-saving as pressure setting range can be reduced under load condition.

## Characteristic Features of AIRZEUS SDS-U

OIL-FREE SCREW COMPRESSORS  
**AIRZEUS**  
SDS-U SERIES

1 New-Type Air Block improving efficiency and saving energy

→ High performance

2 New and High-Functional Control Panel featuring quick and simple operation

→ Easy control

3 Providing lower noise level

→ Environment and human-friendly

4 Power Saving Control

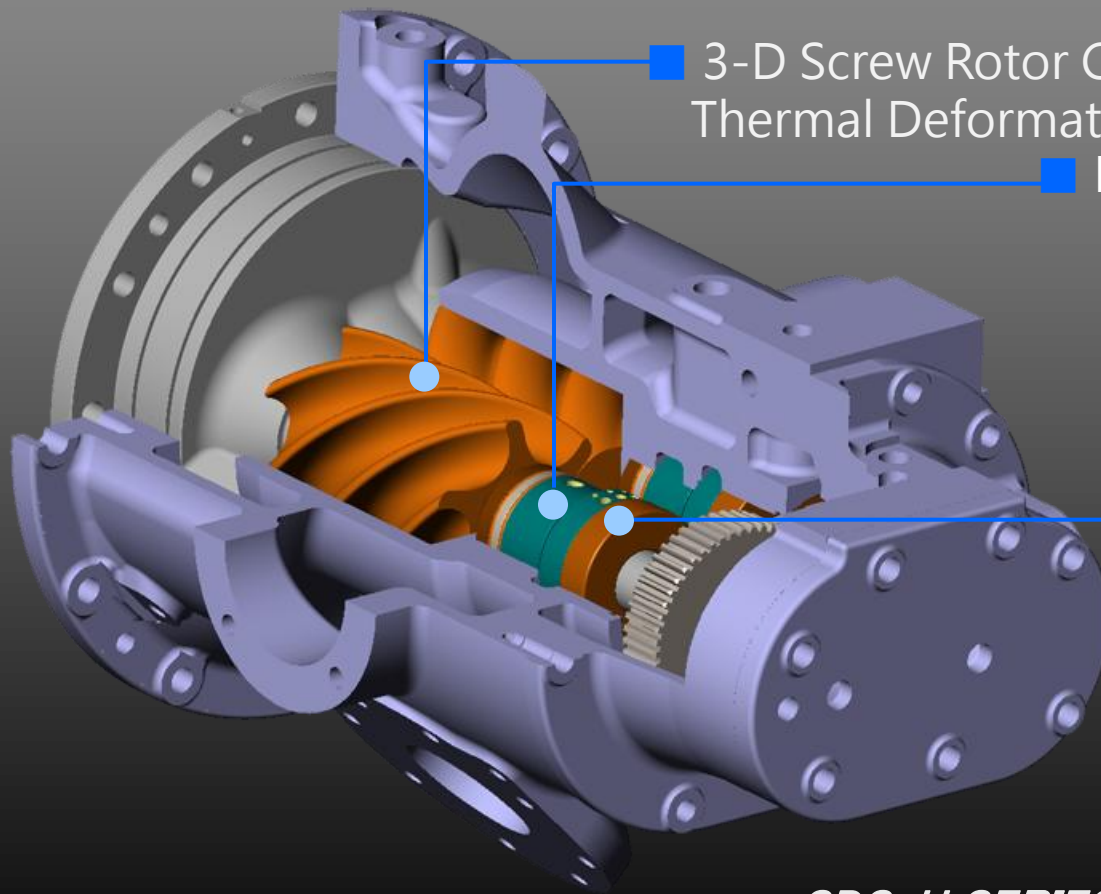
→ Saving energy and reducing CO<sub>2</sub> emission

# Characteristic Features of AIRZEUS SDS-U

➔ High performance

Improving efficiency and saving energy

## New-Type Air Block



■ 3-D Screw Rotor Compensating Thermal Deformation

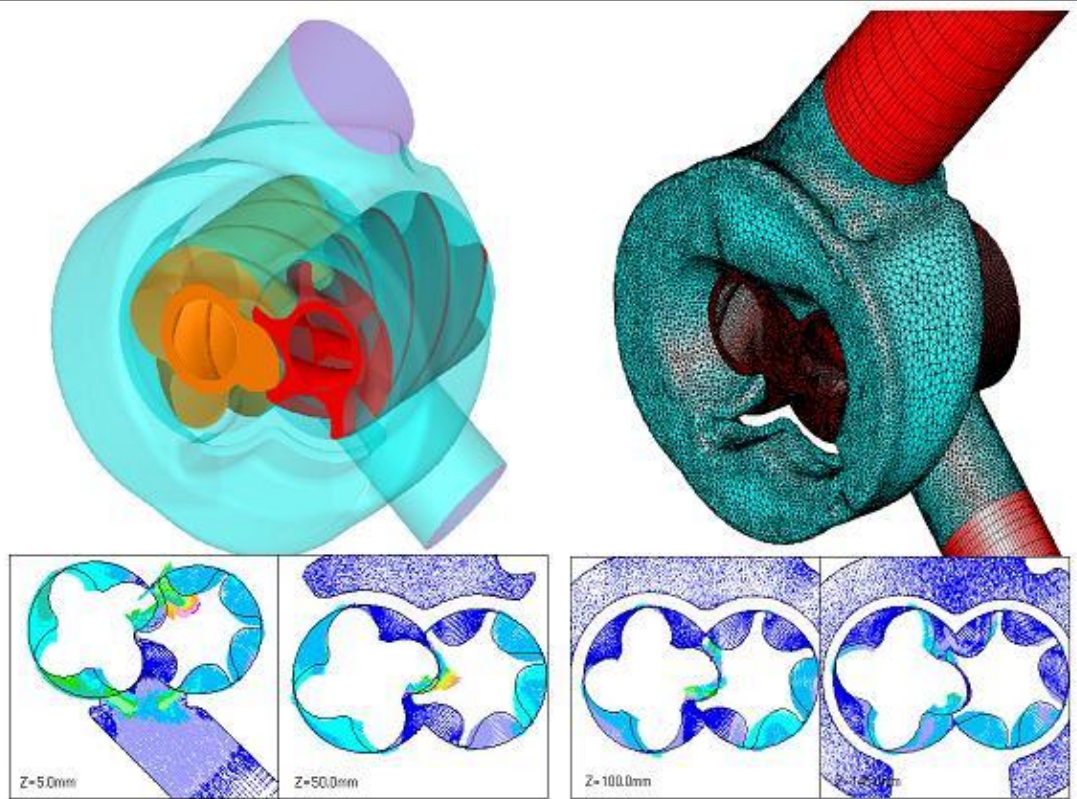
■ Highly Reliable Shaft Seal

■ Long-Life Bearings



➔ High performance

## Air Block Fluid Analysis applying CFD Technology



Improving Performance  
by 2.5% compared with  
Hitachi's conventional  
model

(SDS-U280[280kW])

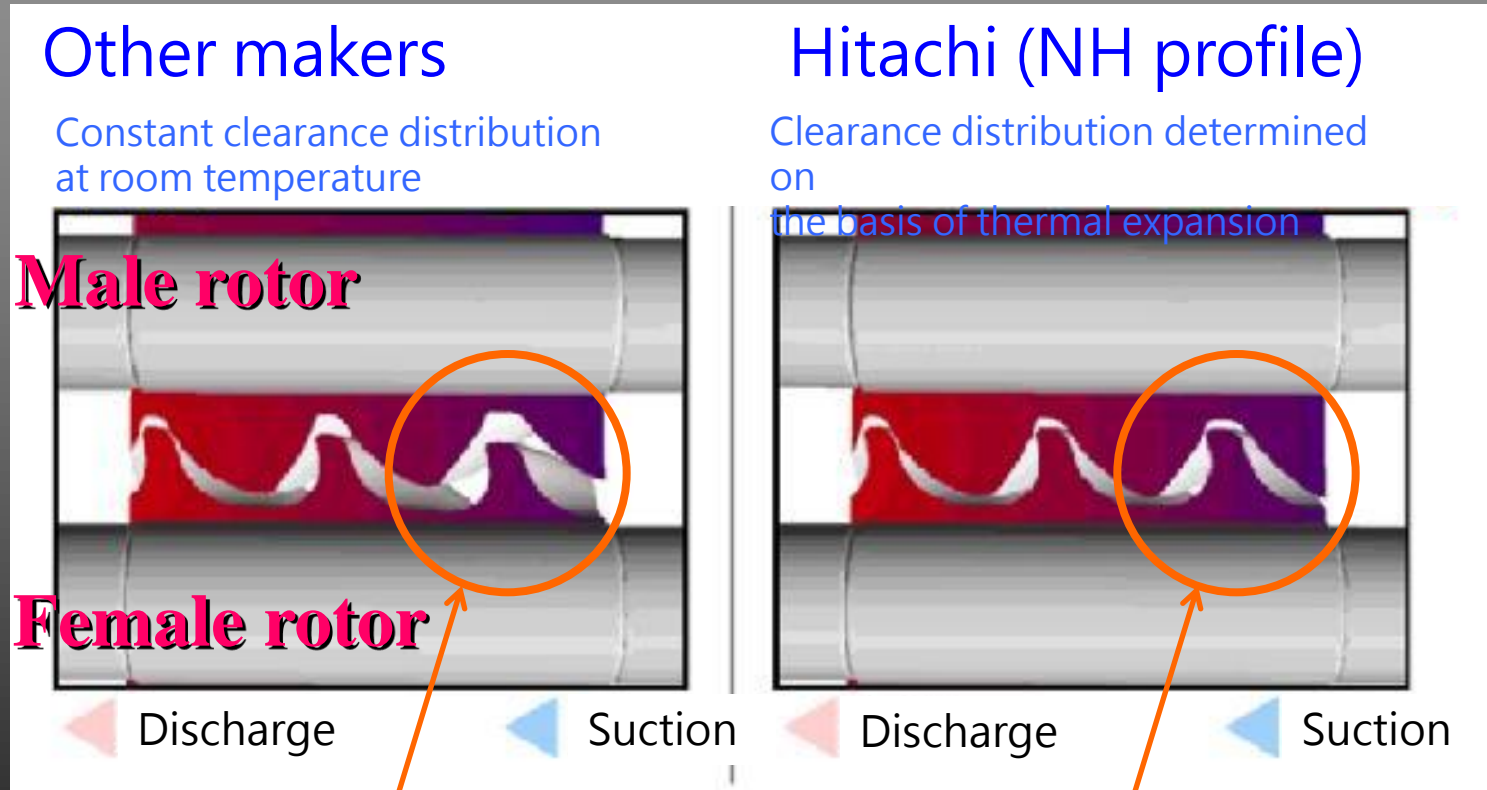
Reducing approximately  
56,000kWh consumption  
annually

Reducing CO<sub>2</sub> emission by  
approximately **31tons**  
annually

The 3-D fluid analysis that makes full use of an advanced CFD (Computational Fluid Dynamics) technology simulates

➔ High performance

### Thermal deformation compensation profile rotor [Patented]



Large clearance under operating condition      Small clearance under operating condition

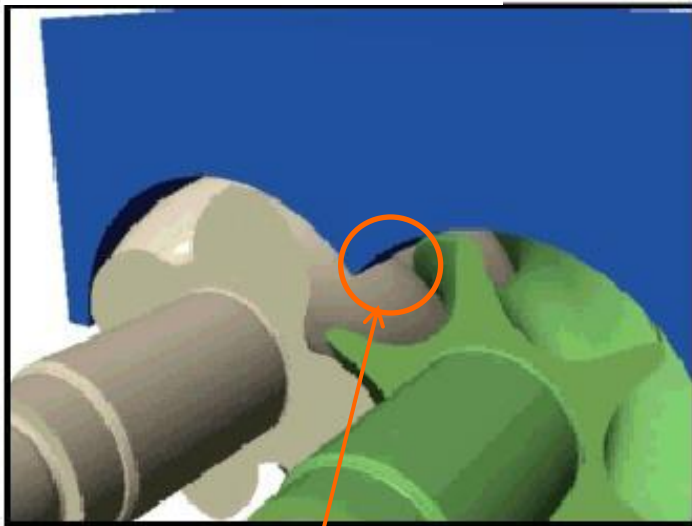
High efficiency is achieved.

➔ High performance

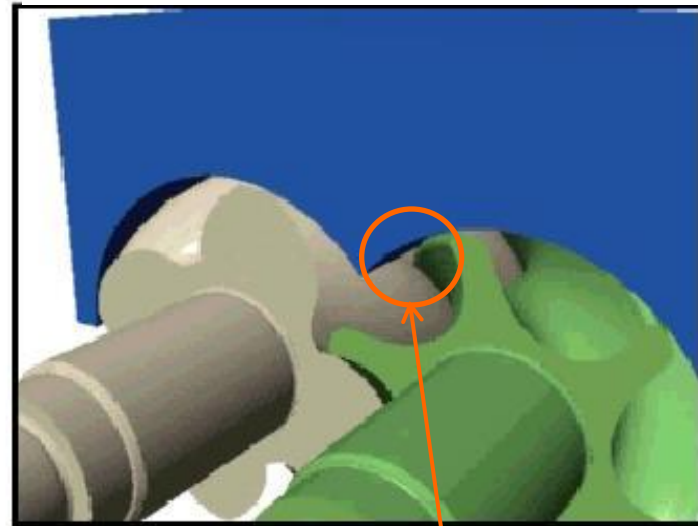
## Blow hole of UH profile rotor [Patented]

NH profile rotor minimizes the blow hole as well as the optimization of rotor clearance. The blow hole is a triangular hole consisting of screw casing, male rotor and female rotor.

### Other makers



### Hitachi (NH profile)

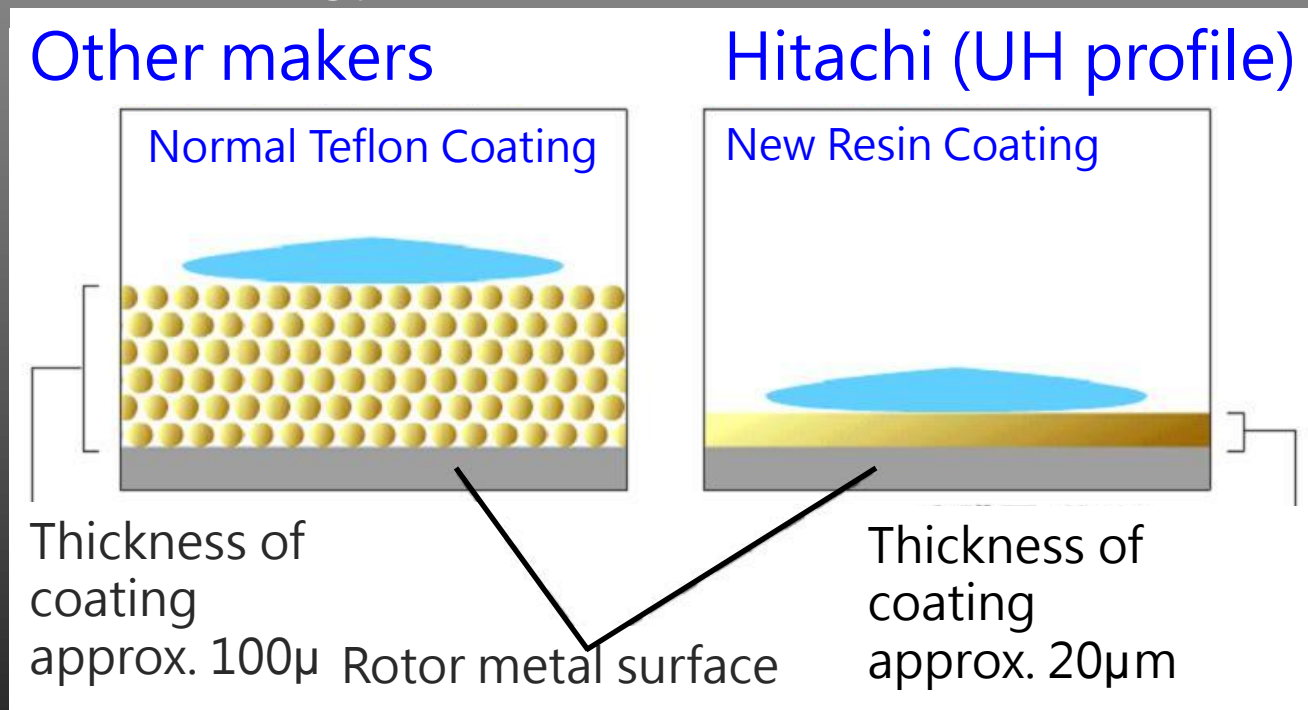


Large clearance blow hole      Small clearance blow hole  
High efficiency is achieved.

## → High performance

### Newly developed resin coated rotor [Patented]

A newly developed coating is applied to the surface of the UH profile rotor to increase its durability. The new resin coating give a uniform pin-hole-less coating over the rotor and shuts off the penetration of water for a long period.



Initial performance can be kept for long time.

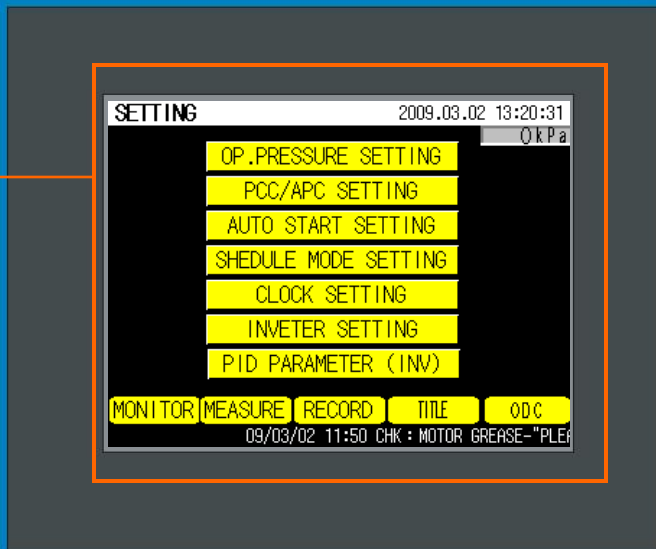


## → Easy control

### New and Highly-Functional Control Panel featuring quick and simple operation

- An easy-to-watch, highly maneuverable and color LCD touch panel is adopted.
- Simple setting up Hitachi's original power saving control
- Quick navigation function works to instantly reach your desired screen
- It is capable of setting various parameters and displaying various histories as well as trend graphs.

Color LCD  
Touch Panel

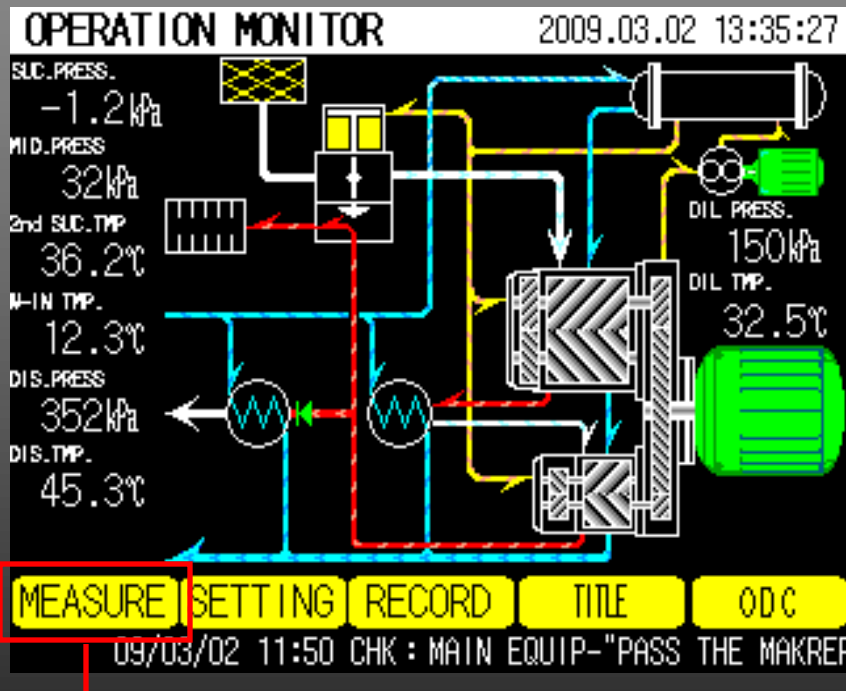


Display of CHECK  
and 3-Step Self-  
Diagnostic  
Functions  
(MAINTENANCE/  
ALARM/TRIP)

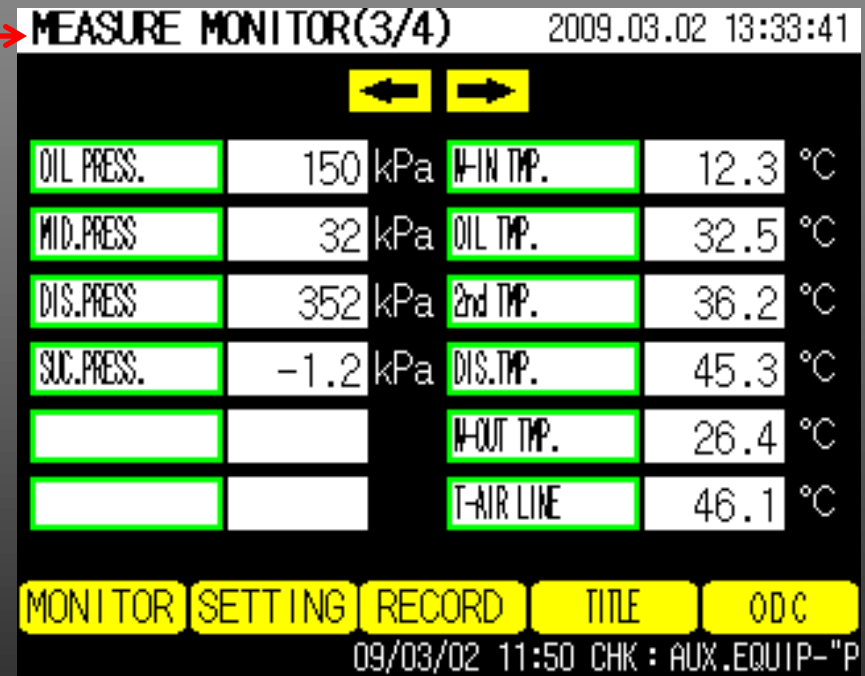
Control button  
& LED

➔ Easy control

## Easy-to-Watch Monitoring Display



Operation monitoring



Measured value display

➔ Easy control

## Operation History (Value/Graph) Trip History(Detail/List)

HISTORY

Operation history display(set and measured values)

OPERATION RECORD 1 / 100 2009.03.02 13:26:16  
k P a

DATE/REC: 2009 Y 03 M 02 D 13 H 00 M

COMP.	STOP	APC SET	DIS	AUTO-S	DIS
LOCATION	LOCAL	PCC SET	DIS	SCHEDULE	DIS
MOTOR	STOP	PSC SET	DIS		
OIL-P	STOP				

RECORD

09/03/02 11:50 CHK : MOTOR GREASE-"PLEASE FIL

Trend graphs display

TREND GRAPH (4/5) 2009.03.02 13:50:04  
EXPLAN IND-CHANGE 352 k P a

03.02 13:42 03.02 13:43 03.02 13:43

RECORD

09/03/02 11:50 CHK : MAIN EQUIP-"PASS THE MAK

Trip history list display

ALL LIST 2009.03.02 13:39:07  
352 k P a

DATE	MESSAGE	RESET
09/03/02 13:38	A:SENSOR ERROR	
09/03/02 13:34	COMP.RUN	13:38
09/03/02 13:31	T:DIS.T SENSOR ERRO	
09/03/02 11:50	T:DIS.T SENSOR ERRO	13:17
09/03/02 11:50	A:SENSOR ERROR	13:38
09/03/02 11:50	CHK:MAIN EQUIP	
09/03/02 11:50	CHK:AUX.EQUIP	
09/03/02 11:50	CHK:MOTOR GREASE	
09/03/02 11:50	P:C.W.FREEZE	13:19

MONITOR MEASURE SETTING RECORD O D C

09/03/02 11:50 CHK : MOTOR GREASE-"PLEASE

Trip history detail display

ALARM RECORD 1 / 6 2009.03.02 13:26:51  
k P a

AL : SENSOR ERROR

DATE/REC: 2009 Y 03 M 02 D 11 H 48 M

COMP.	STOP	APC SET	DIS	AUTO-S	DIS
LOCATION	LOCAL	PCC SET	DIS	SCHEDULE	DIS
MOTOR	STOP	PSC SET	DIS		
OIL-P	STOP				

RECORD

09/03/02 11:50 CHK : MAIN EQUIP-"PASS THE I

## Easy control

- Easy-to-Understand HELP Function
- Simple Setting Display

HELP  
SETTING

HELP display

OP.PRESSURE SETTING 2009.03.02 13:27:40  
kPa  
INITIALIZE  
UNLOAD. PRESS. SET 880 kPa  
LOAD. PRESS. SET 830 kPa  
MIN. PRESS. SET 400 kPa  
TARGET PRESS. SET 860 kPa  
SETTING HELP  
09/03/02 11:50 CHK : AUX.EQUIP-"PASS"

10-key input

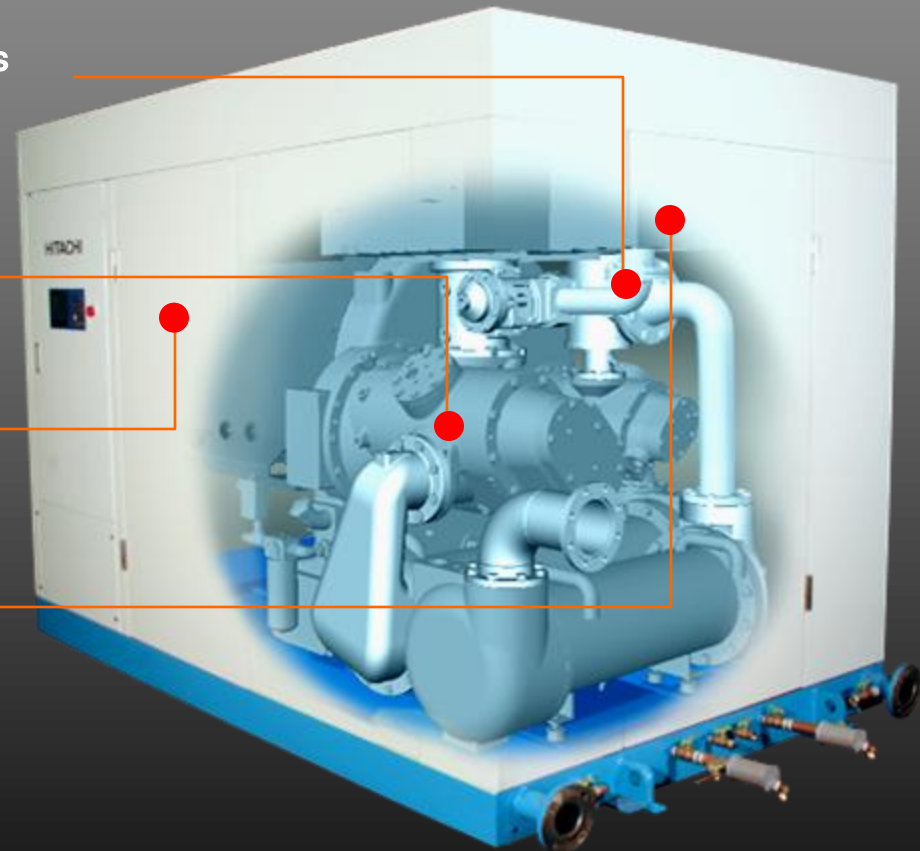
PRESS SET EXPLANATION 2009.03.02 14:03:27  
kPa  
WHEN IT SWITCHES TO UNLOADING WHEN THE EXHALATION PRESSURE REACHES THE UNLOAD PRESSURE, AND IT REACHES THE LOAD PRESSURE, IT SWITCHES TO LOAD.  
WHEN THE LINE PRESSURE FALLS BELOW THE LOAD LOWER BOUND PRESSURE SETTING VALUE WHEN THE COMPRESSOR IS BEING DRIVEN, THE WARNING DISPLAY IS DONE.  
UNLOAD PRESS  
LOAD PRESS  
LOAD LOWER BOUND PRESSURE  
ALARM OUT  
BACK  
09/03/02 14:03 CHK : AUX.EQUIP-

OP.PRESSURE SETTING 2009.03.02 13:29:09  
UNLOAD. F 880 CANCEL  
LOAD. PRE MIN 850 MAX 880  
MIN. PRES 7 8 9 DEL  
TARGET PR 4 5 6 AC  
1 2 3 ENT  
0 . +/- T  
SETTING  
09/03/02 11:50 CHK : MAIN EQUIP-"PASS T"

➔ Environment and human -friendly

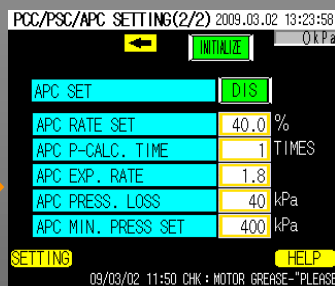
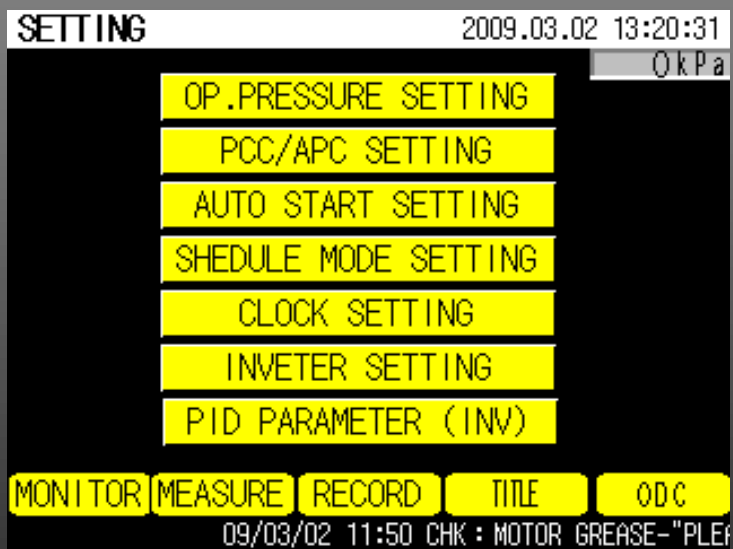
# Providing lower noise level

- This **DISCHARGE SILENCER** reduces irritating high-frequency noise by reducing the pressure pulsations of the compressor air.
- New-Type **AIR BLOCK** suppresses pulses caused by air pressure.
- **Sound Proof Cover** reduces noise such as the panel-transmitting ones.
- **SILENCER DUCT** prevents noise leakage from the suction inlet and the air vent.

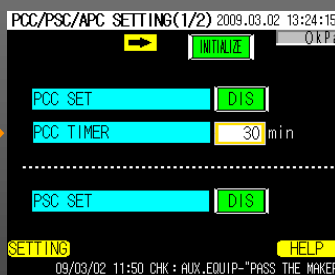


➔ Ecology

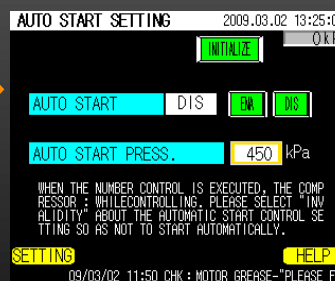
## Power Saving Control [APC/PSC/ASS]



End Pressure Control with **APC**  
APC: Active Power Control [patented]  
**9% Energy Saving**  
Reducing CO<sub>2</sub> emission by approximately 90 tons annually



Precision Pressure Control with **PSC**  
PSC: Power Save Control [patented]  
**2% Energy Saving**  
Reducing CO<sub>2</sub> emission by approximately 24 tons annually

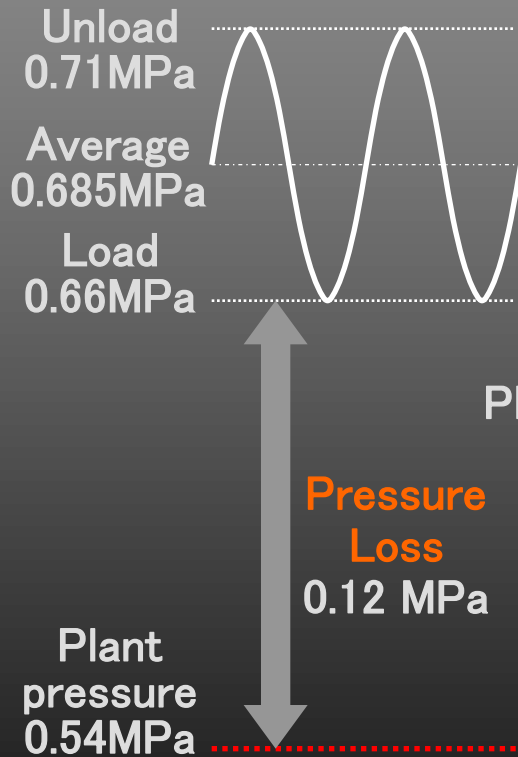


Automatic Start/Stop with **ASS**  
ASS: Auto Start & Stop  
**5% Energy Saving**  
Reducing CO<sub>2</sub> emission by approximately 48 tons annually

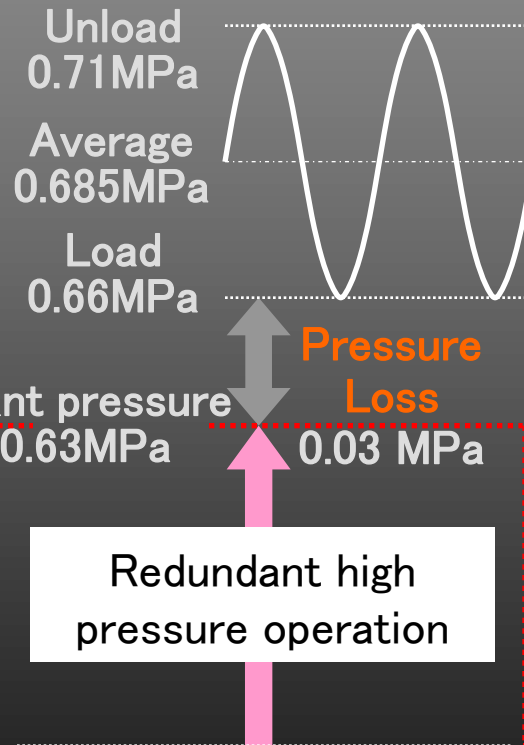
→ Ecology

## APC (Active Power Control) 【Patented】

When air consumption is 100%



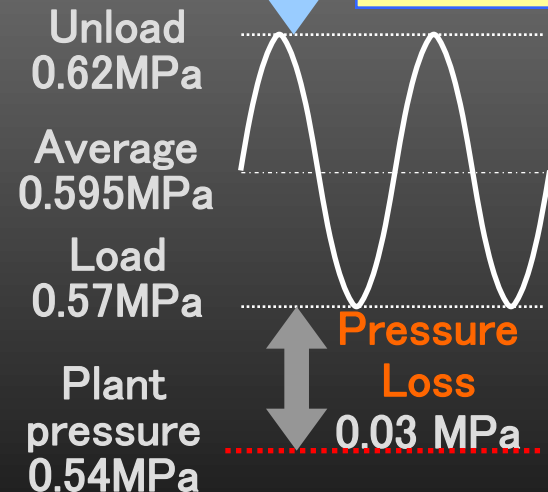
When air consumption is 50%  
(Conventional Model)



When air consumption is 50%  
(APC)

When APC is activated, the controller calculates the piping pressure loss according to the change of air consumption from the load ratio and decreases the discharge pressure.

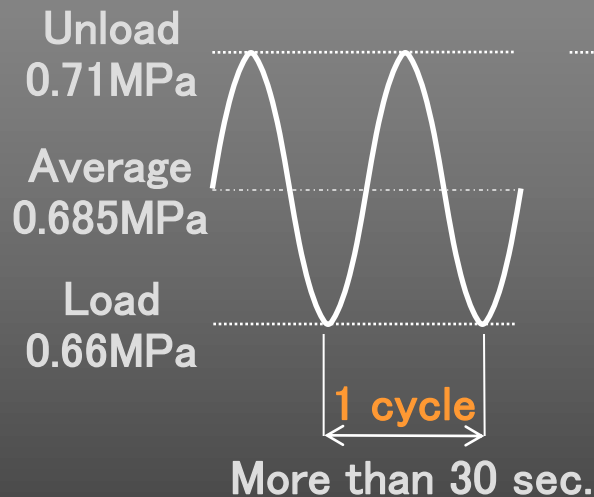
**APC Effect**



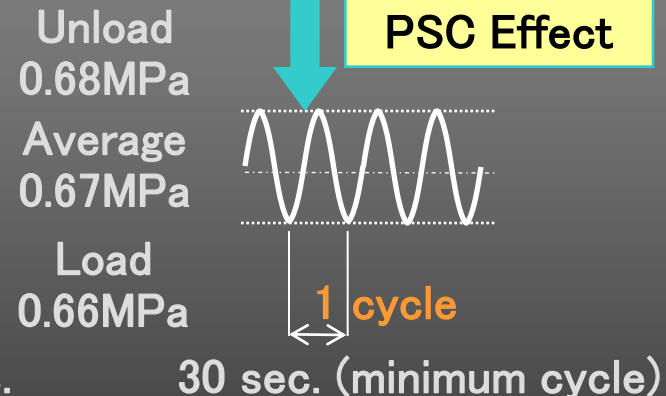
When air consumption becomes 50%, the piping pressure loss is also **decreasing up to 25%**. Accordingly the plant pressure becomes higher than the plant required pressure.

## PSC (Power Save Control) 【Patented】

### Conventional Model



### PSC

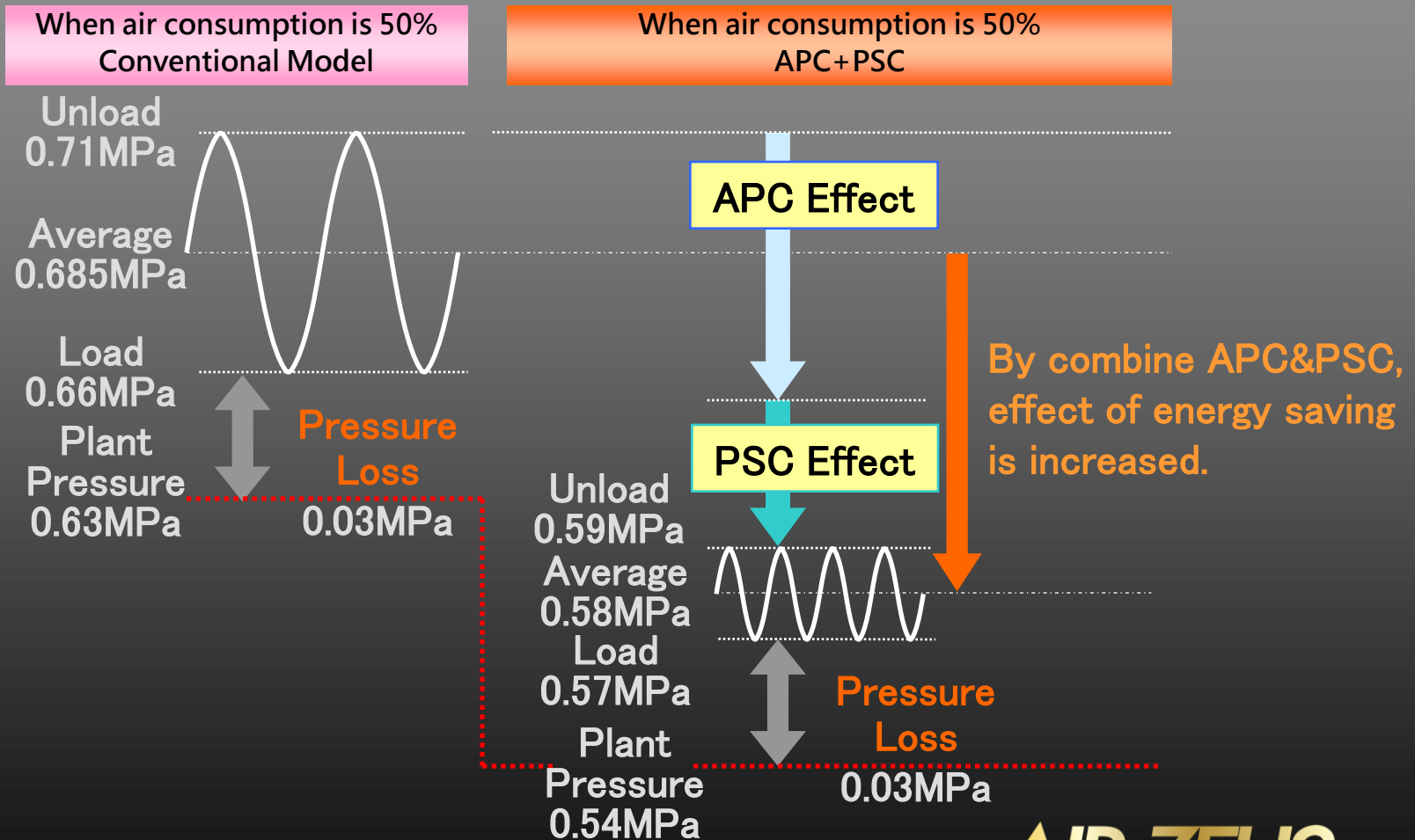


When PSC function is activated, unload pressure is automatically decreased until cycle time reaches the minimum time (30 sec.). Then average pressure is decreased, and power is decreased.



→ Ecology

## APC+PSC



## → Ecology

### Multiple Unit Control Function (Option)

The multiple unit control function can be incorporated in the controller. Merits of APC&PSC extend all the units of multiple unit control. The energy-saving effect is increased drastically.

#### Master Unit (with multiple unit control function)



Slave Units (Old type units and other makers can be controlled.)

**Up to 9 units can be controlled.**

# SDS-UV Series Features 1

## (1) Energy-saving by variable speed control with inverter

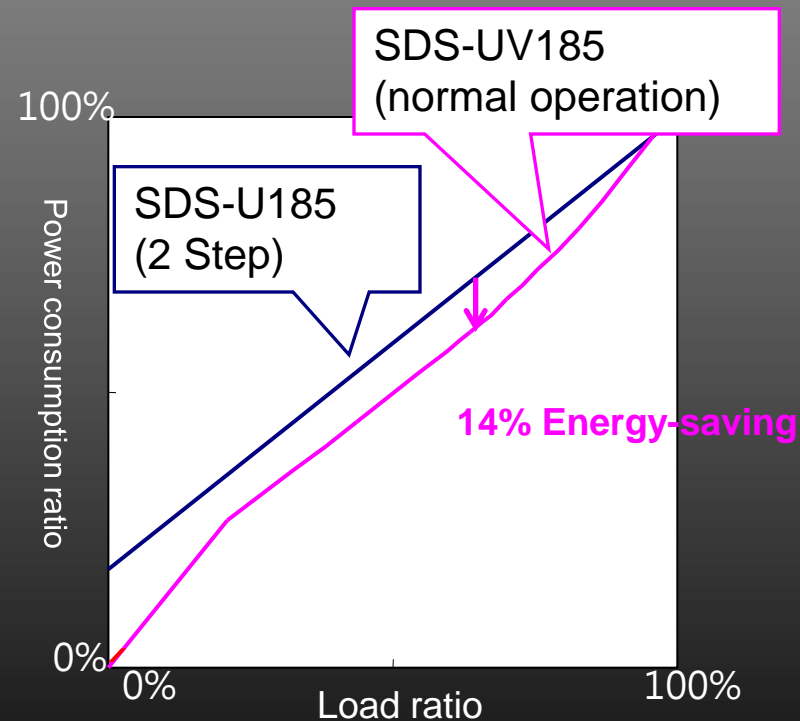
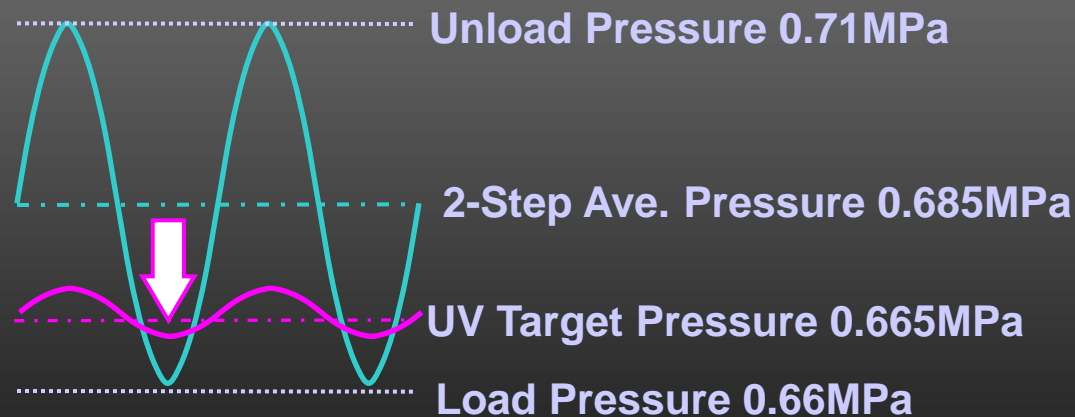
Fluctuation range of discharge air pressure is minimized to 0.01MPa which enables to cut unneeded pressure and power consumption.

At 60% load ratio, **14% energy-saving** compared with fixed speed 2 step control compressor (185kW model).

Decrease Pressure



Decrease Power



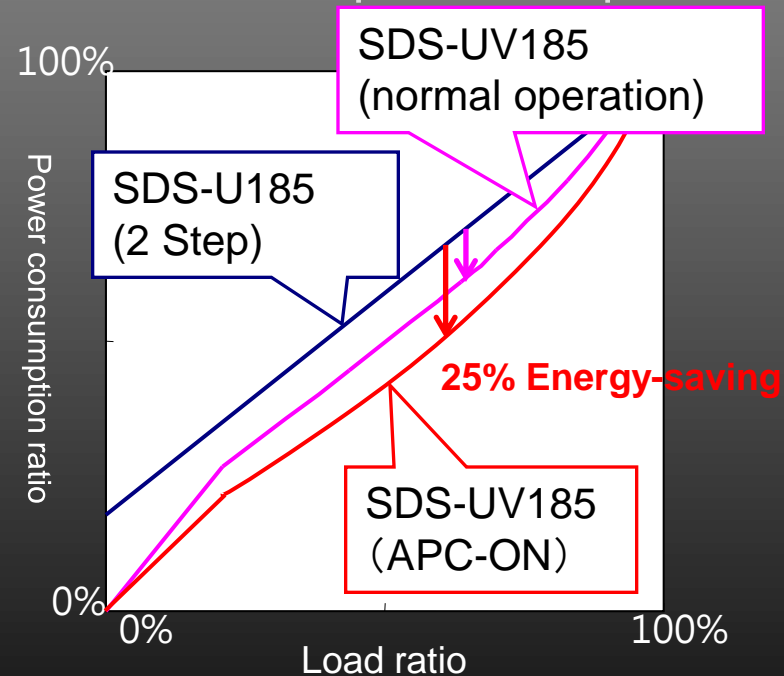
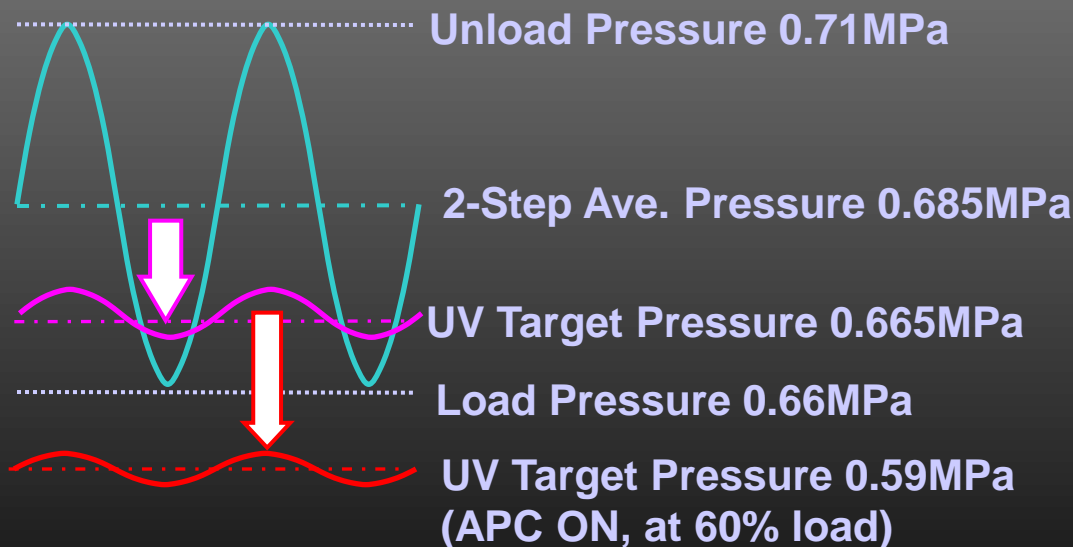
# SDS-UV Series Features 2

## (2) Further energy-saving by Hitachi APC function (Patented)

APC (Active Power Control) is Hitachi's unique technology to control use point pressure by automatic calculation of pressure loss in dryer, filter and piping. At low load ratio (low flow rate), pressure loss becomes smaller.

APC reduces setting pressure automatically and control use point pressure.

At 60% load, **25% energy-saving** compared with fixed speed 2 step control compressor (185kW model).



# Active Power Control (APC)

----- Pressure of fixed speed type  
----- Pressure of inverter type

**100% Load**

**50% Load  
without APC**

**50% Load  
with APC**

Unload 0.71MPa

Ave. 0.685MPa

Inv. Target  
0.665MPa

Load 0.66MPa

**Pressure  
Loss**  
0.12 MPa

0.71MPa

0.685MPa

0.665MPa

0.66MPa

Use Point  
0.63MPa

**Pressure  
Loss**  
0.03 MPa

Less pressure loss and  
higher pressure at use  
point. But, compressor  
discharge pressure still  
remains.

APC reduces target pressure  
automatically by calculating  
pressure loss reduction.

0.62MPa

0.595MPa

0.575MPa

0.57MPa

0.54MPa

**Pressure  
Loss**  
0.03 MPa

Use Point 0.54MPa