Kobelco's Service Network

KOBELCO NET WORK

Kobelco has set up a sales/service network around the world to meet customers' requirement more perfectly. This network can provide various services from daily technique support to technology proposals.

Our sales and service staff carefully listen to customers' opinions, and transfer them to technology departments to guide development of Kobelco's compressors. We will ceaselessly strive to provide customers with the most suitable and the highest quality compressors.

Heart to Heart

our way of saying that we view things from our customersperspective. Through this market-oriented approach to doing business, we want to contribute to society.

※Specifications and descriptions herein may change without notice.

ERD-AE-01 SH1312

KOBELCO
KOBE STEEL GROUP

OIL-FREE SCREW COMPRESSORS

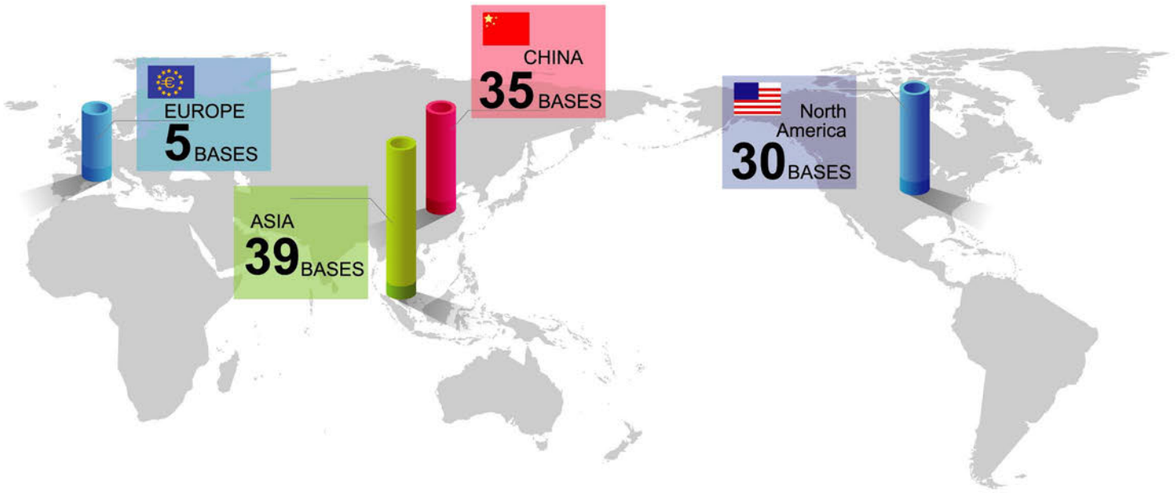
Emeraude

FE SERIES
FE15-75A
FE37-75AV
15-75kW

ALE SERIES
ALE45A/W-400W
ALE75A/W-250WV
45-400kW

KOBELCO COMPRESSORS

KOBE STEEL GROUP Overseas Bases



About KOBELCO

KOBELCO is a corporate brand of KOBE STEEL GROUP who is a major steel producer in Japan founded in 1905.

KOBE STEEL adopts diversified farming system and has 8 major business unit, Iron & Steel, Aluminum & Copper, Welding, Machinery, Engineering, Construction Machinery, Mobile Crane, and other business unit like Real Estate.

Each business unit is leading Japanese industry with its 'Only One / Number One' technology.

Now the consolidate subsidiaries are more than 200, and total numbers of employee reaches 35,469 in 03.2012.

Fortune 500
company
Magazine as one of the world's top 500 corporations

Group Name: Kobe Steel. LTD.
Unified Trademark: KOBELCO
Founding Date: Sep.1, 1905

KOBELCO
KOBE STEEL GROUP

About KOBELCO Compressors

Since 1915 KOBELCO COMPRESSOR

Kobelco has a long history of compressors manufacturing and technologies since it produced a high pressure reciprocating compressor for the first time in Japan in 1915. It made Japan's first oil-free screw compressor in 1956. In addition, it began to get involved in the production of centrifugal compressor in 1966, thus becoming one of the world's few co mprehensive compressor manufacturers that can produce all piston, screw, centrifugal compressors.

Kobelco, as a material producer, is acquainted with material characteristics and properties, as well as material processing technology. It can develop and produce high efficiency, high performance, high quality products. Its experienced techniques and proven product quality, as well as the eternal pioneer spirit and the pursuit of a more perfect quality make it the industry leader.

Nowadays, Kobelco produces oil-injected and oil-free screw compressors in Japan, US and China and supplys to all over the world.

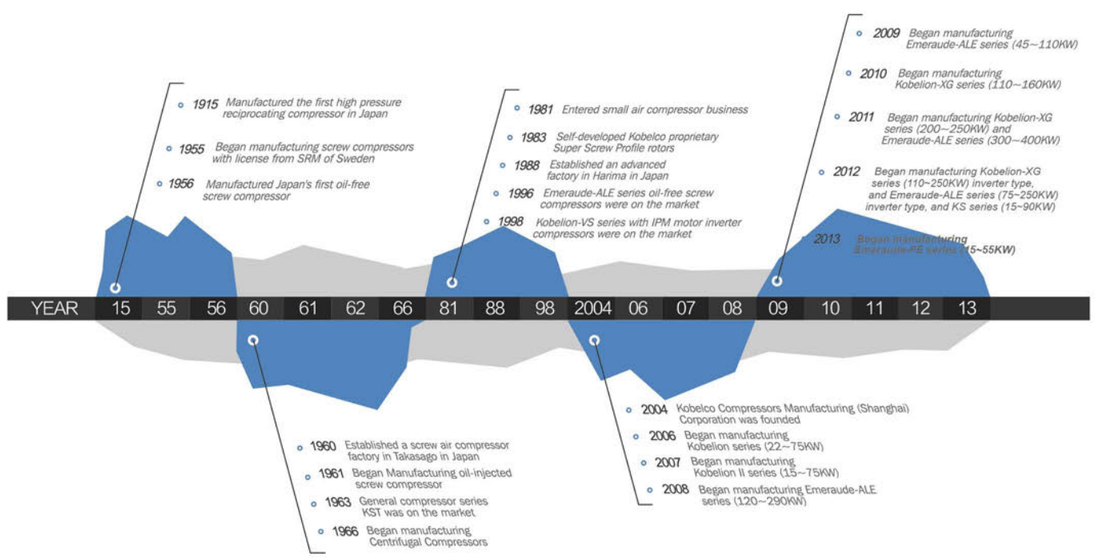
1915
1956
1966
1988
1997
2004
2013

Japan's first high pressure compressor

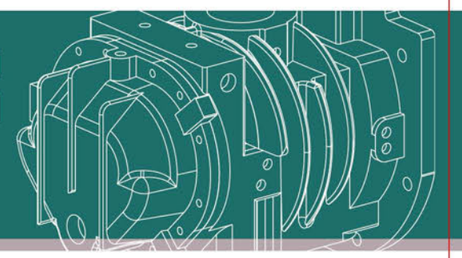
Emeraude-FE

Kobelco factory is certified by ISO9001 Quality management, and ISO14001 Environmental Management.

KOBELCO COMPRESSORS DEVELOPMENT HISTORY



Core technology of Kobelco, Crystallized technology for many years, Powerful guarantee of air quality!



High quality products need high quality process technology, especially for compressed high quality air is very important throughout the manufacturing process. End products will be affected by the oil in compressed air.
Emeraude series oil free screw compressors are crystals of Kobelco's 100 plus years experiences for compressor research and technology, to offer you 100% oil free compressed air.

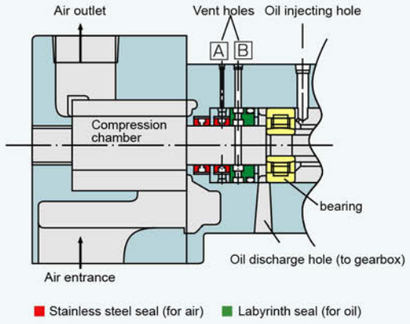
Absolute oil free, clean compressed air

Kobelco proprietary design and manufacture. No oil in compression chamber results in 100% oil free air.
Kobelco, Kobelco adopts stainless steel sealing rings in the seals to avoid producing carbon powder.

■ Stainless steel seals

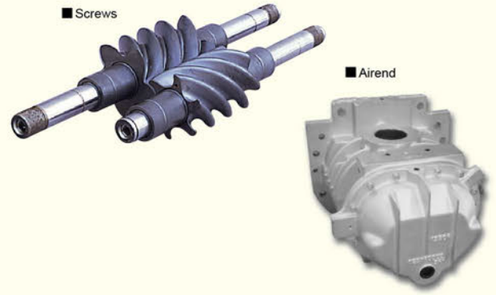
2 vent holes Kobelco Patent

Kobelco proprietary '2 vent holes' construction to avoid oil entering compression chamber through seals even the compressor has been running unloaded for a long time.



State-of-the-art Airend from Japan

Emeraude series adopts Kobelco's latest airends imported from Japan, to ensure high quality and high performance.



High efficient 2 stages compression

2 stages compression results in lower specific power, higher cooling effect, and decreased pressure drop. Its performance improves 5%~10%.

Emeraude
OIL-FREE SCREW COMPRESSOR

Emeraude is derived from French language meaning Emerald. It represents gorgeous, eternal and brilliant. We choose it as this series name to stand for Kobelco's advanced technology in oil free compressor.

- FE15–55A
  FE37–55AV
  15–55kW
- ALE45A / W–400W
  ALE75A / W–250WV
  45–400kW

Proven reliable technology

Kobelco has been innovating the best compressed air solution for customers since we produced Japan's first oil free screw compressor in 1956.

High efficiency and energy saving

2 stages compression results in lower specific power.
V inverter model adopts Internal Permanent Magnet motor.
Kobelco patent – Energy Saving Logic.

Easy maintenance

Simple maintenance with long time intervals.

Optimized controller

Function-rich ITCS controller facilitates operation and saves time.
2 machines can coordinate running by simply connecting them with wires.
Multiple units coordination can be achieved by a group controller.

Environment friendly

There is an oil mist filter to keep your factory clean when release pressure in the gearbox.

Thermosetting coating

There are supreme thermosetting coatings on the surfaces of screws and housing inner wall, to prevent corrosion, as well as reducing internal leakage by reducing clearance.

Low noise

Lower pulsation noise, improve tone quality.

Inverter Drive, the Perfect High Efficiency and Energy Saving!

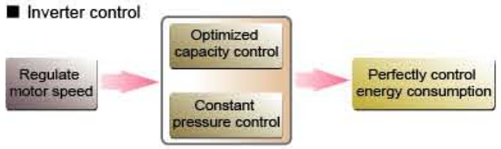
Oil-Free INVERTER Compressor Emeraude

It combines advanced motor and inverter technologies by adopting the latest Internal Permanent Magnet motor and high efficient inverter. It represents excellent reliability and energy saving.

Reduce energy consumption by optimized capacity and constant pressure controls

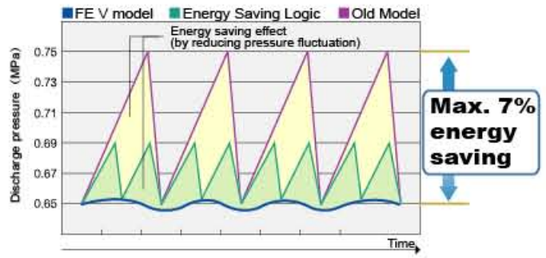
Kobelco's unique inverter and Energy Saving Logic control can optimize energy saving effect, no matter how the load condition of it is. They can trace the pressure changes quickly and maintain the pressure fluctuation with in ±0.01MPa, and supply necessary air volume by optimized power.

■ Inverter control



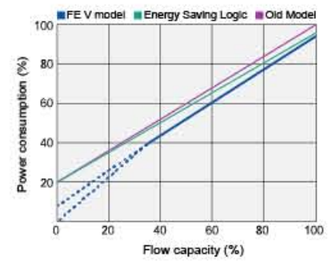
Energy saving by constant pressure control

Pressure fluctuation can be controlled within ±0.01MPa,



Regulate flow capacity by changing rotating speed

■ Energy saving characteristics



■ Energy saving sample (37AV compare with old model)

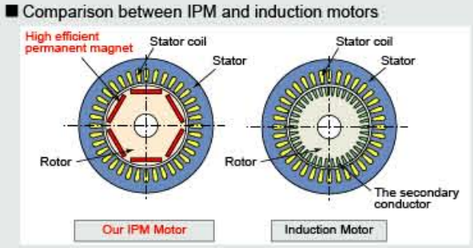
The first one to adopt Internal Permanent Magnet motor

Internal Permanent Magnet motor

Internal Permanent Magnet motor as a standard configuration

It has a much better efficiency than standard and premium induction motors.
In addition, it has a better energy saving effect by adopting high efficient inverter compared to previous inverter.
Motor maintenance workload is reduced by prolonged re-grease interval because IPM motor has a low bearing temperature.

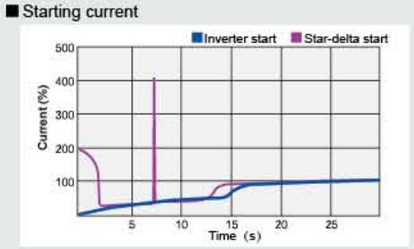
■ Comparison between IPM and induction motors



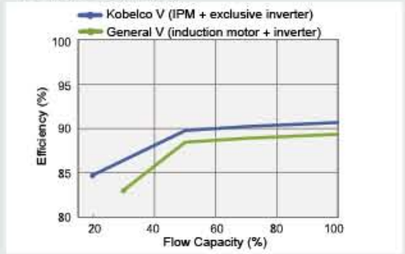
Soft start of inverter

Reduce starting current and torque to realize steady soft startup, as well as lower electrical devices cost.

■ Starting current



■ Combined efficiency



Other characteristics

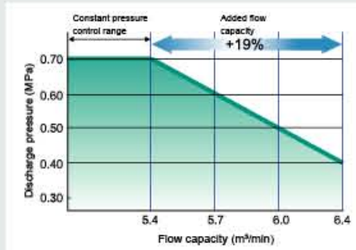
High frequency reactor is a standard configuration to filter out high frequency harmonics produced by inverter (according to JEMA high frequency harmonics suppression directive).

Forced cooling on inverter prevents trip at high temperature in summer.

Coating on electronic panel can resist dirt and moisture effectively and enduringly.

Adopt Wide Range Control (increase flow capacity in low pressure) ※Only for FE37AV

Wide Range Control



Expand flow capacity range in low pressure to increase its maximum capacity, as well as supply optimized solution for energy saving.

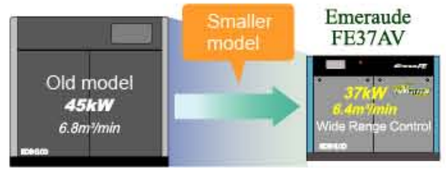
—Transfer the method from retrenching to utilization.

■ Flow capacity changes under Wide Range control for FE37AV

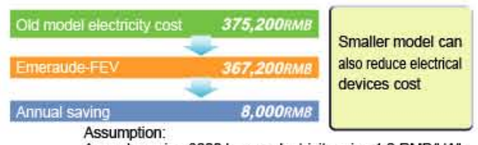
Discharge pressure (MPa)	0.7	0.6	0.5	0.4
Capacity (m³/min)	5.4	5.7	6.0	6.4
Added flow capacity (%)	100	106	111	119

Energy saving by adopting small models

Customer needs capacity of 6.4m³/min, pressure 0.4MPa



Reduce annual operating cost by a big margin



Assumption:
Annual running 8000 hours, electricity price 1.2 RMB/kWh
(compare with 0.5-0.4 unload/load operation)

Clean & Oil-Free

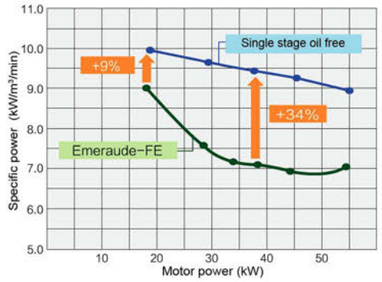
A century's core technology offers you pure and clean oil free compressed air!

Emeraude series has Kobelco's proven oil free screw compressor technology. It supplies absolute oil free compressed air, as well as guarantees efficiency and reliability.

High efficient two stages compression

Two stages compression not only saves energy, but also educes discharge temperature and improves reliability. Its efficiency improves 9~34% compared with single stage oil free screw compressor.

■ Efficiency comparison



New screws

New developed screw profile is designed by finite element analysis. It minimizes air leakage from discharge end to suction end due to non-contact rotation, realizing high efficiency.

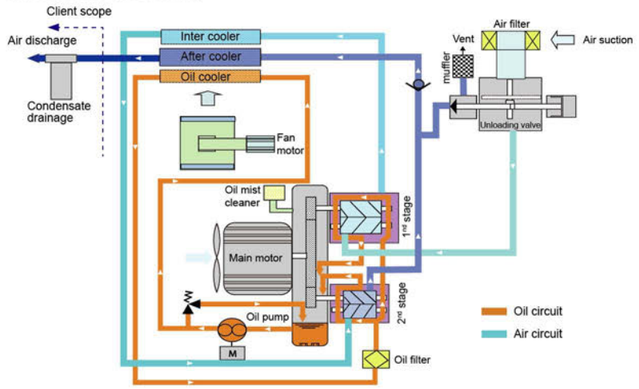
Direct drive transmission

There is a gearbox between airends and motor without coupling, in order to reduce mechanical losses. ISO 5 / AGMA 12 high accuracy gears have advantages of long service life, less transmission losses, low noise and low vibrations, etc.

Supreme thermosetting coating

Screws' surfaces and inner walls of airend housing are coated by PTFE or MoS2 thermosetting coating which has super strong adhesion, anti-corrosion and high thermostability properties.

■ Flow chart（FE series）

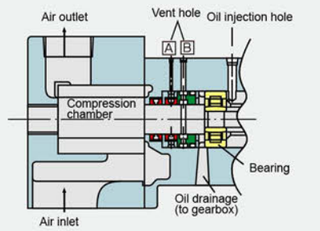


■ Thermal expansion finite analysis

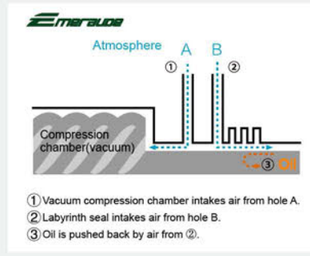
Two vent holes construction Kobelco Patent

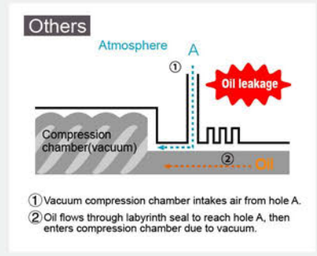
Two vent holes construction ensures no oil entering compression chamber through the seals even if the compressor is unloading for a long time.

■ Two vent holes



■ Unload running

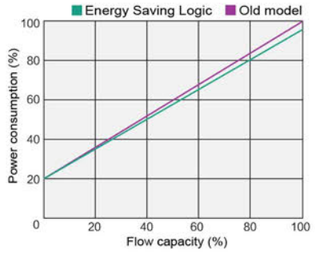




Minimize pressure fluctuation

To reduce pressure fluctuation, Kobelco adopted pivotal unloading valve and achieved to reduce pressure fluctuation from 0.1MPa to 0.05MPa, which eliminates eliminating energy consumption caused by unnecessary pressure rise.

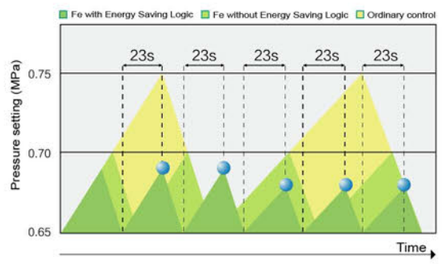
■ Energy saving characteristics



Energy Saving Logic Kobelco Patent

It can unload the compressor in advance if unload/load cycle is longer than setting time (at least 23s). Thus eliminate energy consumption caused by unnecessary pressure rise.

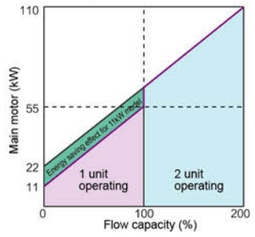
■ Energy Saving Logic characteristics



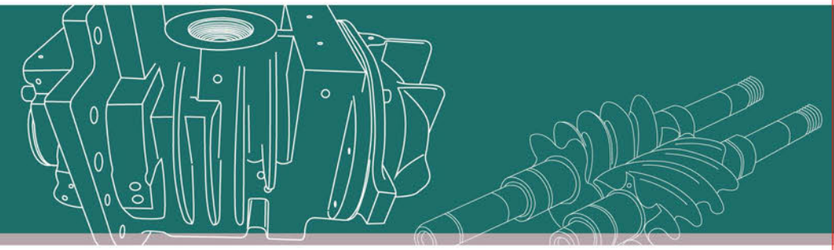
Coordination of two units

2 units can be coordinated running by simply wiring them.
without group controller
Its own controller can set start sequence.
Standard configured wiring terminals for connection with ordinary group controllers.

■ Example: 55kW x 2units



Detailed Elaborate Design

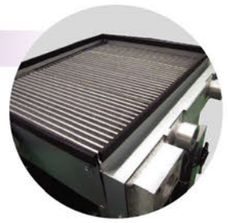


Unloading valve

The pivotal unloading valve has very sensitive response.It will be only affected slightly even if there is severe air turbulence. The valve disc has long service life (it can withstand 3 million motion test).
It is operated by pneumatic forces, so oil cannot enter compression chamber even if any accident happens. Of course oil can't enter condensate from intercooler nor aftercooler.

Endure high ambient temperature

Big cooling fan is horizontally installed beneath the coolers.
Cooling capability is 60% higher than old model.
The compressor can run stably even if ambient temperature reaches 45°C.
Plate-fin-tube type cooler for ALE water cooled model reduces internal pressure loss to 1/5 of ordinal shell and tube cooler, and achieve extreme high package performance.



High efficient motor

Motors are Class Finsulation,total enclosed fan cooled, prevent dust and water from entering it.
In addition, standard configured phase sequence detector prevents motor from rotating reversely, , which protects air compressor.
Thirdly, standard configured thermocouple monitors temperature in motor coil to protect motor.(※Option for ALE series)

Energy saving solenoid

Timer controlled solenoid valve for drain are on intercooler and aftercooler.
It stops draining when unload to avoid unnecessary air losses and pressure decrease in air net.
In addition, manual drainages are standard configurations.

Individual oil pump motor

Adopt individual oil pump motor to guarantee oil pressure during startup and stop.
Ensure proper lubrication on mechanical parts to prolong their service life.

Energy saving and environment friendly

Standard configured oil mist filter not only releases pressure in gearbox, but also keeps workshop clean.
Oil mist recovery rate is 99.5% and above. It is installed within the bodywork and recovered oil flows back automatically. It needn't additional piping installation.

High performance air filter

It is a solution for dusty environment.
Separate dust by centrifugal + filter two steps.
Dust filtering accuracy is 99.98% according to ISO 5011.

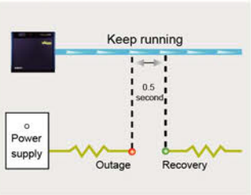
Standard configured dust strainer

The strainer ensures clean air entering, as well as suppresses noise.
It pre-filters dust and prolongs air filter's service lifetime.
Prevent coolers from blocking and stabilize coolers' performances.
Prevent motor from dirt and stabilize motor's performance.

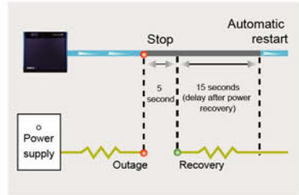
Perfect electrical protections

- Setting for transient electricity outage...within 0.5 sec.
  The compressor doesn't stop if electricity outage is within the setting time. The compressor will stop only when electricity outage exceeds the setting time.
- Setting for automatic restart after electricity outage...0.5~20sec.
  (Example as right) Resuming electricity is set at 5 seconds, delay setting is 15 seconds after electricity resumes.
- Installed 12,000V surge protector and noise filter inside.

■ Continue running for transient electricity outage within 0.5 second



■ Automatic restart after electricity outage



ISO 8573-1 Class 0 certified air quality ※ALE series

All Emeraude-ALE series have passed the latest ISO8573-1:2010 Class 0 Oil-free Certification, which is the highest grade for compressed air's oil free (cleanness) qurity.
This certification is also an acknowledgement of Kobelco's oil free compressor technology!

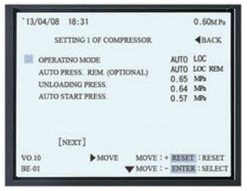
Function Rich Big ITCS Controller

Energy Saving Solution

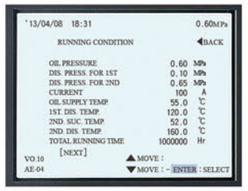
Standard configured crystal display electronic controller

IP65 protection, high resolution display with LCD background lighting.
Chinese, Japanese, English three languages display.
It monitors not only running status of compressor, but also sets parameters such as discharge pressure, etc.
It can also record operation, display chart, set weekly timer, manage daily and weekly information.

Compressor setting



Data group 1

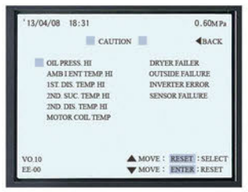


Data group 2

Runing record

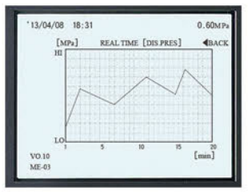
Maintenance information

Caution



Emergency stop

Running data record



Weekly timer setting

Running status display

Many data such as oil supply pressure, oil supply temperature, running current, airends' suctions and discharges temperatures, main motor coil temperature, running hours in loading,number of loading, etc.

Maintenance signals appear timely

Up to 35 self-diagnose functions, display maintenance/caution/emergency stop signals timely, and corresponding troubleshooting measures. Facilitate daily inspection/maintenance/management, as well as preventing compressor from breaking suddenly to ensure safe production.

Weekly timer setting

Up to 7 start/stop settings in a week.

Running data/charts display

Running current data display (every 5 seconds).
Operation data display (each hour of the latest 24 hours).
Display contents: 2nd stage discharge pressure, 1st stage suction pressure, 2nd stage discharge temperature, Running current, Number of loading rate.

Standard configured MODBUS connector to monitor compressor's status remotely

Modbus module reads compressor's pressures/temperatures/current, etc by Modbus protocol (communication program), to realize remote inputs of run/stop/load, etc.
Remotely monitor compressor status timely, facilitating operating management and response quickly when abnormal condition appears.

■ MODBUS

EconoMild group controller – optimized energy saving solution

EconoMild can control up to 8 compressors as a group.
This controller starts units in a circular sequence to balance their running hours and number of starts.
This controller optimizes running units according to required flow capacity, to realize the most energy saving solution.

■ EconoMild group controller

Energy saving combination 1

4 standard units

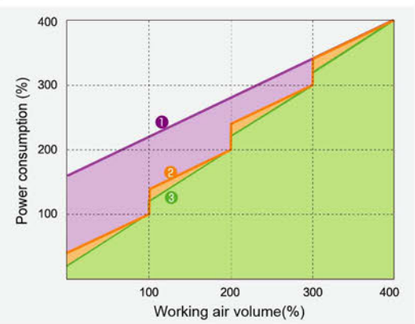
Energy saving combination 2

4 standard units + EconoMild group controller

Energy saving combination 3

3 standard units + inverter unit + EconoMild group controller

■ Control curve



Electricity consumption comparison

Calculation example:

Model: 37KW, 4 units
Unit price: US$0.15/kWh
Annual running hours: 8000
Average loading units: 1.5

Specifications

FE V Inverter Series

Model	Max. pressure (MPa)	Flow capacity (m³/min)	Main motor (kW)	Outlet connection	Noise (dB)A	Dimensions (mm)			Weight (kg)
						L	W	H	
FE37AV	0.75	5.4	37	40A(R1・1/2)	68	1,650	1,100	1,500	1,035
FE55AV		8.1	55		67	1,950	1,200	1,500	1,440

FE Series

Model	Max. pressure (MPa)	Flow capacity (m³/min)	Main motor (kW)	Outlet connection	Noise (dB)A	Dimensions (mm)			Weight (kg)
						L	W	H	
FE15A	0.75	2.05	15	25A(R1)	63	1,650	900	1,500	865
FE22A		3.8	22		64	1,650	900	1,500	905
FE30A		4.8	30	40A(R1・1/2)	67	1,650	1,100	1,500	980
FE37A		5.8	37		68	1,650	1,100	1,500	1,000
FE45A		6.9	45		65	1,950	1,200	1,500	1,315
FE55A		8.1	55		67	1,950	1,200	1,500	1,395
FE22A-H	0.86	3.2	22	25A(R1)	64	1,650	900	1,500	905
FE30A-H		4.2	30	40A(R1・1/2)	67	1,650	1,100	1,500	980
FE37A-H		5.1	37		68	1,650	1,100	1,500	1,000
FE45A-H		6.3	45		66	1,950	1,200	1,500	1,315
FE55A-H		7.5	55		68	1,950	1,200	1,500	1,395

※ Plesae refer to《Standard Specification Maual》for more details

Model name explanation

FE 37 A □ – H

Series name	Main motor power	Cooling method	Starter	Discharge pressure
FE	15~55kW	A: Air cooled	No: Star-delta V: Inverter	No: 0.75MPa H: 0.86MPa
ALE	45~400kW	A: Air cooled W: Water cooled	No: Star-delta V: Inverter	No: 0.75MPa H: 0.86MPa SH: 0.88MPa SX: 0.10MPa

■ Notes:

Power supply: 380V/50Hz/3 phases 3 lines
Flow capacity: Value converted to inlet conditions
Air inlet conditions: 1 bar, 20℃, 0%

ALE V Inverter Series

Air-cooled Models

Model	Max. pressure (MPa)	Flow capacity (m³/min)	Main motor (kW)	Outlet connection	Noise (dB)A	Dimensions (mm)			Weight (kg)
						L	W	H	
ALE75AV	0.75	11.6	75	JIS10K-40A RF	70	2,385	1,400	1,783	2,160
ALE100AV		17.0	100	JIS10K-50A RF	69	2,466	1,500	2,160	2,980
ALE75AV-H	0.88	10.1	75	JIS10K-40A RF	72	2,385	1,400	1,783	2,160
ALE100AV-H		15.7	100	JIS10K-50A RF	71	2,466	1,500	2,160	2,980

Water-cooled Models

Model	Max. pressure (MPa)	Flow capacity (m³/min)	Main motor (kW)	Cooling water Qty.(L/min)	Outlet connection	Noise (dB)A	Dimensions (mm)			Weight (kg)
							L	W	H	
ALE75WV	0.75	11.8	75	106	JIS10K-40A RF	66	2,120	1,170	1,683	2,180
ALE100WV		17.2	100	147	JIS10K-50A RF	67	2,604	1,335	1,891	2,980
ALE160WV		28.4	160	259	JIS10K-65A RF	69	2,900	1,565	1,860	4,300
ALE250WV		43.6	250	382	JIS10K-80A RF	70	3,250	1,565	2,143	5,650
ALE75WV-SH	0.88	10.3	75	106	JIS10K-40A RF	68	2,120	1,170	1,683	2,180
ALE100WV-SH		15.9	100	147	JIS10K-50A RF	69	2,604	1,335	1,891	2,980
ALE160WV-SH		26.4	160	259	JIS10K-65A RF	71	2,900	1,565	1,860	4,300
ALE250WV-SH		41.4	250	382	JIS10K-80A RF	72	3,250	1,565	2,143	5,650
ALE75WV-SX	1.0	10.3	75	106	JIS10K-40A RF	69	2,120	1,170	1,683	2,180
ALE100WV-SX		14.1	100	147	JIS10K-50A RF	71	2,604	1,335	1,891	2,980
ALE160WV-SX		23.8	160	259	JIS10K-65A RF	73	2,900	1,565	1,860	4,300
ALE250WV-SX		37.8	250	382	JIS10K-80A RF	74	3,250	1,565	2,143	5,650

ALE Series

Air-cooled Models

Model	Max. pressure (MPa)	Flow capacity (m³/min)	Main motor (kW)	Outlet connection	Noise (dB)A	Dimensions (mm)			Weight (kg)
						L	W	H	
ALE45A	0.75	6.8	45	JIS10K-40A RF	67	1,830	1,400	1,783	1,900
ALE55A		8.8	55		68				1,920
ALE65A		10.2	65		69				1,970
ALE75CA		11.8	75		70				2,085
ALE75A		12.8	75	JIS10K-50A RF	67	2,010	1,500	2,160	2,840
ALE90A		15.8	90		68				3,080
ALE100A		17.0	100		69				3,080
ALE45A-H	0.88	5.4	45	JIS10K-40A RF	69	1,830	1,400	1,783	1,900
ALE55A-H		6.8	55		70				1,920
ALE65A-H		8.7	65		71				1,970
ALE75A-H		10.1	75		72				2,085
ALE90A-H		12.8	90	JIS10K-50A RF	70	2,010	1,500	2,160	3,080

Water-cooled Models

Model	Max. pressure (MPa)	Flow capacity (m³/min)	Main motor (kW)	Cooling water Qty.(L/min)	Outlet connection	Noise (dB)A	Dimensions (mm)			Weight (kg)
							L	W	H	
ALE45W	0.75	6.9	45	59	JIS10K-40A RF	63	1,730	1,170	1,683	1950
ALE55W		8.9	55	77	JIS10K-40A RF	64				1970
ALE65W		10.4	65	90	JIS10K-40A RF	65				2020
ALE75CW		12.0	75	106	JIS10K-40A RF	66				2135
ALE75W		13.0	75	108	JIS10K-50A RF	65	2,150	1,335	1,891	2850
ALE90W		16.0	90	134	JIS10K-50A RF	66				3080
ALE100W		17.2	100	147	JIS10K-50A RF	67				3080
ALE120W		21.6	120	194	JIS10K-65A RF	67	2,900	1,565	1,860	4330
ALE132W		23.9	132	215	JIS10K-65A RF	68				4350
ALE145W		26.5	145	222	JIS10K-65A RF	68				4450
ALE160W		28.4	160	259	JIS10K-65A RF	69				4500
ALE180W		32.8	180	299	JIS10K-65A RF	69				4570
ALE200W		36.4	200	306	JIS10K-80A RF	69	3,250	1,565	2,143	7950
ALE220W		39.0	220	336	JIS10K-80A RF	70				8030
ALE250W		43.6	250	382	JIS10K-80A RF	70				8110
ALE270W		48.0	270	398	JIS10K-80A RF	71				8190
ALE300W		53.5	300	550	JIS10K-100A RF	75	3,700	2,000	2,395	5980
ALE315W		57.2	315	590	JIS10K-100A RF	75				6020
ALE355W		63.7	355	650	JIS10K-100A RF	75				6100
ALE400W		70.0	400	720	JIS10K-100A RF	75				6160
ALE45W-SH	0.88	6.9	45	59	JIS10K-40A RF	65	1,730	1,170	1,683	1950
ALE55W-SH		8.4	55	77	JIS10K-40A RF	66				1970
ALE65W-SH		8.9	65	90	JIS10K-40A RF	67				2020
ALE75W-SH		10.3	75	106	JIS10K-40A RF	68				2135
ALE90W-SH		14.1	90	134	JIS10K-50A RF	68	2,150	1,335	1,891	3080
ALE100W-SH		16.0	100	147	JIS10K-50A RF	69				3080
ALE110W-SH		17.1	110	152	JIS10K-50A RF	69				3230
ALE132W-SH		21.6	132	215	JIS10K-65A RF	70	2,900	1,565	1,860	4350
ALE145W-SH		23.8	145	222	JIS10K-65A RF	70				4450
ALE160W-SH		26.4	160	259	JIS10K-65A RF	71				4500
ALE180W-SH		28.4	180	299	JIS10K-65A RF	71				4570
ALE200W-SH		33.2	200	306	JIS10K-80A RF	72	3,250	1,565	2,143	5980
ALE220W-SH		36.3	220	336	JIS10K-80A RF	72				6020
ALE250W-SH		41.5	250	382	JIS10K-80A RF	72				6100
ALE270W-SH		43.5	270	398	JIS10K-80A RF	73				6160
ALE290W-SH		48.0	290	414	JIS10K-80A RF	73				6280
ALE300W-SH		50.0	300	550	JIS10K-100A RF	75	3,700	2,000	2,395	7950
ALE315W-SH		53.4	315	590	JIS10K-100A RF	75				8030
ALE355W-SH		60.0	355	650	JIS10K-100A RF	75				8110
ALE400W-SH		67.0	400	750	JIS10K-100A RF	75				8190
ALE45W-SX	1.0	5.4	45	59	JIS10K-40A RF	67	1,730	1,170	1,683	1950
ALE55W-SX		6.9	55	77	JIS10K-40A RF	68				1970
ALE65W-SX		8.9	65	90	JIS10K-40A RF	69				2020
ALE75W-SX		10.3	75	106	JIS10K-40A RF	69				2135
ALE90W-SX		12.9	90	134	JIS10K-50A RF	71	2,150	1,335	1,891	3080
ALE100W-SX		14.1	100	147	JIS10K-50A RF	71				3080
ALE110W-SX		16.0	110	152	JIS10K-50A RF	72				3230
ALE120W-SX		17.1	120	158	JIS10K-50A RF	72				3300
ALE145W-SX		21.5	145	222	JIS10K-65A RF	73	2,900	1,565	1,860	4450
ALE160W-SX		23.8	160	259	JIS10K-65A RF	73				4500
ALE180W-SX		26.4	180	299	JIS10K-65A RF	73				4570
ALE220W-SX		32.7	220	336	JIS10K-80A RF	72	3,250	1,565	2,143	6020
ALE250W-SX		36.3	250	382	JIS10K-80A RF	72				6100
ALE270W-SX		38.9	270	398	JIS10K-80A RF	73				6160
ALE290W-SX		41.1	290	414	JIS10K-80A RF	73				6280

※ Plesae refer to《Standard Specification Maual》for more details