

PRODIGY[®] SERIES

WATER COOLED & AIR COOLED
SCREW CHILLERS



KIRLOSKAR CHILLERS PRIVATE LIMITED
A Kirloskar Group Company



Enriching Lives

ABOUT KIRLOSKAR CHILLERS

Kirloskar Chillers is proud to be a part of a century old Kirloskar Group. This diversified business conglomerate has been seminal to Indian agricultural and industrial development. Every company in the group has been pioneering the fields where India needed innovation. We gave India its first iron plough, water pump, electric motor, compressor and engine, inventions that were born from the need of the hour and went on to become signs of the times. In today's era, we have been spearheading the efforts to introduce highly energy efficient and eco-friendly products.

Today, a rich manufacturing experience spanning over two decades. A strong customer orientation & entrepreneurial approach are distinctive features of Kirloskar Chillers' operations. These have been finely honed into a winning combination, suited to offer fully flexible and customised technology solutions to the market. Through a comprehensive range of state-of-the-art technology products, an AHRI certified test facility and the backed up by a widespread and competent service network, we are in the business of bringing joy to our customers.

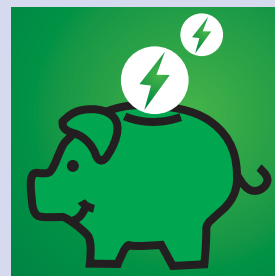


PRODIGY® SERIES

HIGHLY ENERGY EFFICIENT

PRODIGY® series chillers are developed to achieve very high efficiencies at all working conditions, resulting in extremely low life cycle costs. PRODIGY® Screw cooled chillers comply with IGBC and ECBC requirements.

PRODIGY® series also encompass various heat recovery equipment like - Partial Heat Recovery, Full Heat Recovery, Reverse Cycle Heat Pump.



HIGHLY RELIABLE

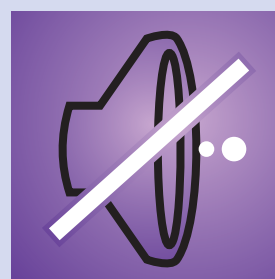
PRODIGY® series chillers are built to the highest standards of quality and a highly reliable product. The proactive control logic ensures that the chiller operates at optimum conditions for across working life, avoids frequent trips under severe operating conditions.

Reliable operation with field serviceability are the hallmarks of PRODIGY® series chillers. Highly reliable compressors, well designed oil management system, proven controller and manufacturing in an ISO 9001 certified factory ensures that these chillers will operate trouble free for years together.



ABSOLUTELY SILENT

The PRODIGY® series chillers are designed to have very low noise levels at all load conditions. Special screw profiles, discharge section with double casing construction, highly efficient & quiet oil separator designs and slide valve guidance system with bearings ensure that the noise levels for these chillers are the lowest in the industry.



PRODUCT RANGE

Water Cooled Screw Chillers:

KWI Series (Flooded Evaporator Screw Chillers with Skid-mounted VFDs, with HFC134a):	145 - 485 TR (510 - 1,705 kW)
KWK Series (Flooded Evaporator Screw Chillers, with HFC134a):	120 - 400 TR (420 - 1,405 kW)
KWS Series (DX Evaporator Screw Chillers, with HFC134a):	50 - 360 TR (175 - 1,265 kW)
KWS Series (DX Evaporator Screw Chillers, with HFC407C):	50 - 510 TR (175 - 1,800 kW)

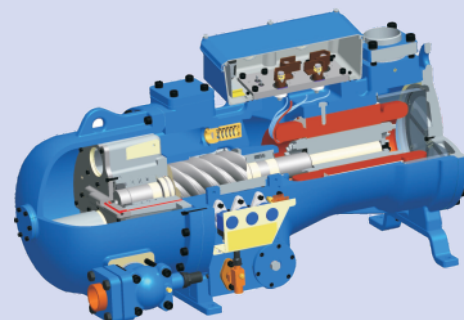
Air Cooled Screw Chillers:

KAS Series (DX Evaporator Screw Chillers, with HFC134a):	45 - 425 TR (160 - 1,490 kW)
KAS Series (DX Evaporator Screw Chillers, with HFC407C):	50 - 435 TR (175 - 1,530 kW)
KAA Series (AC Screw chiller with Adiabatic Cooling arrangement, with HFC134a):	45 - 455 TR (160 - 1,600 kW)

COMPRESSOR

Salient Features of compressors -

- ▶ The most advanced screw rotor profile result in lower frictional losses and thereby highest efficiencies.
- ▶ Semi-hermetic, suction gas cooled, 2 pole, squirrel cage induction motors with all-phase winding protection, suitable for 400 V / 3-Ph / 50 Hz
- ▶ Capacity Modulation for single screw compressor is possible from 100% down to 25%. The feature enables exact matching of cooling capacity and thereby saving of energy.



HEAT EXCHANGERS

- ▶ Evaporators Design options: Flooded & Direct Expansion
- ▶ Condensers Design Options: Water Cooled & Air Cooled
- ▶ Heat exchanger tubes are with internal and external enhanced surfaces, for superior heat transfer. Tubes mechanically bonded into steel tube sheets.
- ▶ Evaporator shell insulated with closed cell nitrile foam.
- ▶ Removable water heads provided to facilitate easy cleaning of tubes.



ELECTRONIC EXPANSION VALVE

The PRODIGY® series chillers are equipped with the most advanced Electronic Expansion Valve to achieve accurate control of refrigerant mass flow, which translate into linear flow of refrigerant over entire operating range through continuous modulation.



EFFICIENT OIL MANAGEMENT SYSTEM

The PRODIGY® series chillers are designed with a simple but highly reliable oil management system resulting in minimum oil carry over. The DX chillers use compressors with built - in oil separators and flooded chillers are provided with external oil separators. This not only results in better reliability of the chillers, but also has great effect on efficiency, as the heat transfer areas do not foul with oil.

ELECTRICAL AND MICROPROCESSOR ADVANTAGE

Kirloskar PRODIGY® series Screw Chillers are supplied with an electrical panel mounted on the structure of the chiller, which is segregated into a power section and a control section for easy maintenance and service.

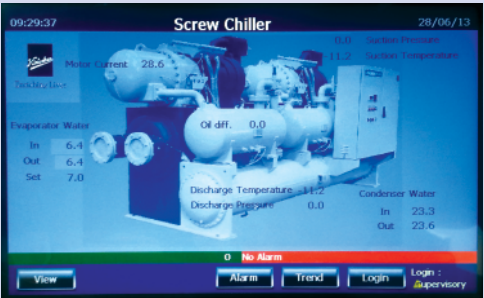
ELECTRICAL PANEL FEATURES

- ▶ Standard Star-Delta Starter with fuse protection.
- ▶ Voltage protection device for phase loss, voltage unbalance and over voltage safety.
- ▶ All the components are operated on 230 V AC, which eliminates use of power transformer. This reduces excessive heating of the panel.
- ▶ Advance K-smart Controller with predictive logic provides precise control to enhance performance of the chillers.



K-SMART CONTROLLER FEATURES

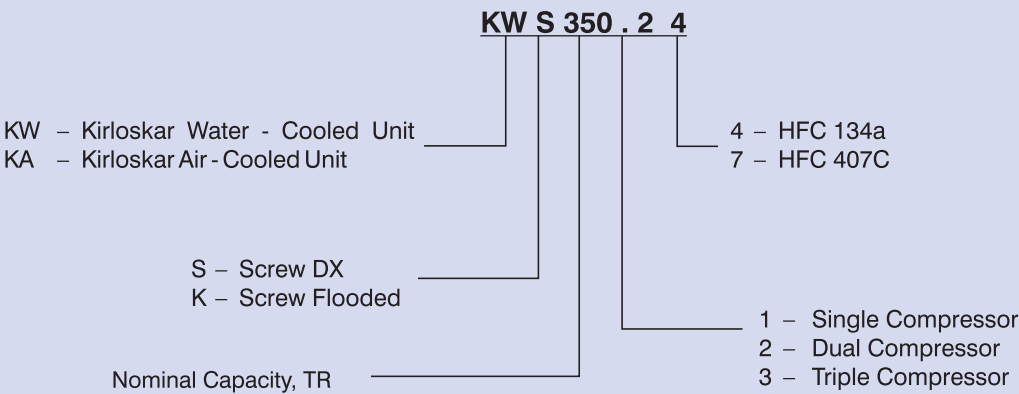
- ▶ 7" Touch screen display, easy to read backlit.
- ▶ Facility to switch over from British to SI units and vice versa for temperature and pressure value.
- ▶ Graphical display of electrical parameters.
- ▶ Manual/Auto mode control.
- ▶ Automatic startup on resumption of power after power failure.
- ▶ Alarm history for last 100 Alarms with critical parameters at time of alarm.
- ▶ Battery backup to retain memory and clock in case of power failures.
- ▶ Compressor Lead-Lag and sequencing facility for multi compressor units.
- ▶ Internal 7-days, 8 day holiday clock with programable duration.
- ▶ Selective lockout facility on alarms to avoid unauthorized operator control.
- ▶ Multilevel password protection.
- ▶ RS 232/485 communication port for easy integration into building management system.
- ▶ BMS compatibility with BACnet, Modbus, LonWorks protocols.



OPTIONAL FEATURES

PC connectivity and remote monitoring through Modem, Telephone Line. In short, the controller is designed to safeguard the chiller unit, eliminate the need for manual intervention and provide a simple but meaningful man-machine interface.

CHILLER NOMENCLATURE



DESUPERHEATER

Kirloskar KWS series, KAS series & KWK series PRODIGY® screw chillers can be offered with a unique heat recovery option, the Desuperheater.

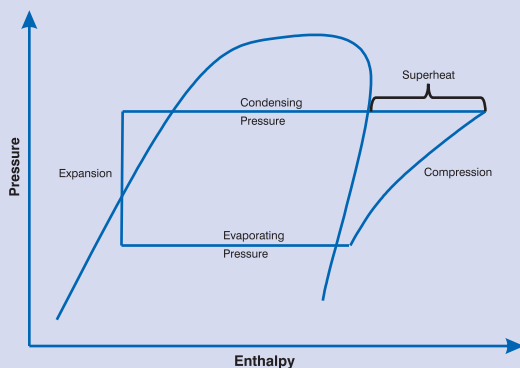
Principle of Operation

Desuperheaters are basically Plate Type Heat Exchangers (PHEs) fitted in the discharge line of the compressor. The superheat of the refrigerant gas leaving the compressor (see figure) is removed by water / fluid before the refrigerant gas enters the normal condenser, which may be either air cooled or water cooled. The latent heat of the refrigerant is then rejected to the cooling media in the condenser.

The basic advantage of a desuperheater over normal heat recovery condenser is that the heat recovery is at normal condensing pressure, unlike in total heat recovery condensers where the condensing pressure must be elevated. Thus, there is no increase in the compressor power. The heat recovered is absolutely free and hence increases the efficiency of the water chiller.

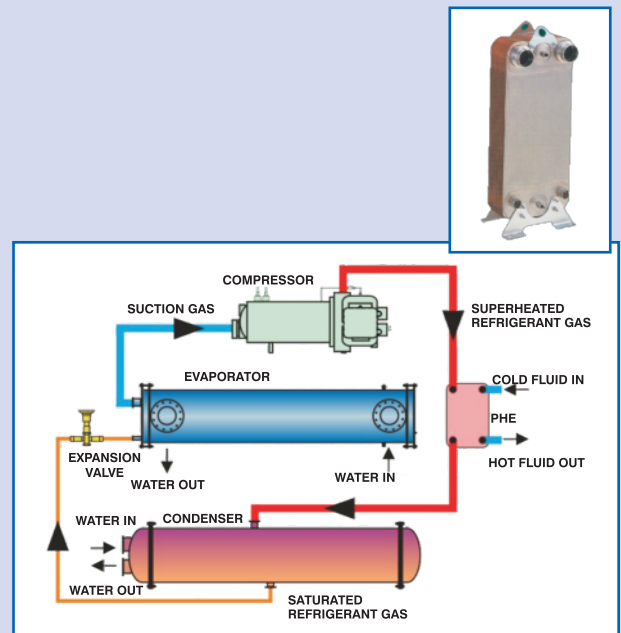
APPLICATIONS

- ▶ Kitchen / Laundry / Domestic hot water requirement in hotels or hospitals.
- ▶ Hot water reheat for low humidity applications in pharmaceuticals or textile industry.
- ▶ Important heat source for pre heating boilers feed water in certain process industries.



In the KWS and KAS series chillers, since the refrigerant discharge temperatures can be as high as 65°C, the heat is generally recovered at a high temperature of 50°C. In the KWK series chillers, normally the heat recovery would be at approx. 40°C, however, with some additional accessories, it can be increased to 48°C. Since PHEs are used instead of conventional shell & tube type heat exchangers, the heat recovery efficiency is also very high. The plate heat exchanger also enables to achieve high temperature differential between entering & leaving hot fluid temperatures, to the extent of 10 ~ 12°C. Approximately 15% of the chiller's cooling capacity can be recovered as heat from a desuperheater.

The amount of heat recovered is a direct saving, thus increasing the efficiency considerably. To illustrate the amount saved, let us consider a case of a 100 TR (350 kW) capacity KWS Series screw chiller. The chiller would consume approximately 70 kW (0.70 kW/TR) at standard rating conditions. If a desuperheater is used for this chiller, the heat recovered would be approximately 50 kW (approx. 15% of 100 TR / 350 kW). This is a direct saving, thus meaning that effective power consumption is about 20 kW (0.20 kW/TR) to satisfy the cooling requirement of 100 TR.



OTHER OPTIONS AND ACCESSORIES

- ▶ Electrical Starters: Star-Delta, Soft starter
- ▶ Spring Isolators.
- ▶ Heat Exchanger Tube MoC: Copper, Cupro-Nickel, Titanium, Stainless Steel.
- ▶ Acoustic enclosures for air cooled chillers for noise reduction.

- ▶ Anti corrosion coatings for air cooled condensers.
- ▶ Marine water boxes.
- ▶ Witness testing at factory on AHRI certified test bed.
- ▶ Desuperheater for hot water generation, useful in Hotels, Hospitals, Pharmaceutical Industry, etc.

STANDARD WARRANTY

PRODIGY® Screw Chillers carry a standard warranty against manufacturing defects and faulty workmanship for a period of 12 months from the date of commissioning or 18 months from the date of dispatch, whichever comes earlier.

TRUSTED BY MANY

Some Of Our Esteemed Customers

Pharmaceutical Industry

- Lupin Ltd, Goa, Pune, Aurangabad
- Glenmark Generics, Mumbai
- Strides Arcolabs, Bangalore
- Biocon Ltd, Bangalore
- Jodas Expoim, Hyderabad
- Wockhardt, Aurangabad

Healthcare

- Chettinad Hospital, Chennai
- Narayana Hrudayalaya, Bangalore
- Ruby Hall Clinic, Pune
- RPG Life Sciences, Mumbai
- B M Birla Reach Center, Delhi
- SRM Institute of Science & Technology, Chennai
- Calcutta Medical Center, Delhi

Commercial Buildings

- UB City, Bangalore
- World Trade Center, Mumbai
- Lodha Projects, Mumbai
- Cadbury India, Pune
- Kalpataru Projects, Mumbai
- Bihar Museum, Bihar

Hotels

- JW Marriott, Mumbai, Bangalore, Delhi
- Courtyard Marriott, Multiple Locations
- Taj Hotels, Multiple Locations within India & Sri Lanka
- Radisson, Multiple Locations

Textile Industry

- JBF Industries Ltd, Silvassa
- Indorama, Jakarta (Indonesia)
- Indo-Bharat, Jakarta (Indonesia)
- Welspun, Wapi
- Garden Silk, Jolwa
- Dicitex Décor, Mumbai, Goa, Thane, Tarapur

Automobile Industry

- Toyota Kirloskar Motors, Bangalore
- Bridgestone India Ltd, Indore
- MICO Bosch, Nasik
- Mahindra & Mahindra, Nasik
- JCB Manufacturing Ltd, Pune
- Force Motors, Pune

Power Industry

- NTPC, Multiple Locations
- Reliance Power, Parichha
- Mukha Power Station, Yemen (Middle East)
- Jhabua Thermal Power Project
- Koyna Hydro Power, Satara

Other Industries

- Hindustan Unilever, Multiple Locations
- Pepsi Co India Holding, Multiple Locations
- John Deere, Pune
- Reliance Industries, Mumbai
- Parle International, Mumbai

Malls & Multiplexes

- Lodha Experia Mall, Mumbai
- Amanora Town Centre, Pune
- Future Group Retail Outlets at Multiple Locations
- Inorbit Mall, Bangalore
- City Pride, Pune



Taj Hotel, Mumbai



Central Mall, Varodara



Narayana Hrudayalaya, Kolkata



City Pride, Kothrud, Pune



SRMC, Chennai



UB City, Bengaluru

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CIN: U29191PN1995PTC095733

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