

Reduce lifecycle costs **Increase savings and design freedom**

The ICV Control Valve - member of the Flexline™ family. The ICV Flexline™ control valves are not only designed to give you savings and design freedom, but they also provide a reliable, safe and green solution for your needs - both now and in the future.

80%

leak risk reduction
through fully
hermetic coupling.

Create the perfect control solution for your application

The ICV Flexline™ family consists of ICM motor control and ICS piloted controlled servo valves and the ICLX 2-step servo-operated valves. The valve variants are based on one common valve body to offer outstanding flexibility. The modular concept of the ICV Flexline™ greatly facilitates the building of a valve that offers energy savings and reduction of down-time. All valves are designed for a maximum working pressure of 52 bar (754 psi) and efficiently handle ammonia, CO₂ and future high pressure refrigerants. As a result you are guaranteed that your needs are accommodated by a reliable, safe and green solution – both now and in the future.



ICS Flexline™
pilot controlled servo valve

ICM Flexline™
direct motor controlled valve

ICLX Flexline™
two-step servo-operated main valves



The modular and flexible valve concept

The modular ICV Flexline™ concept gives you a high degree of flexibility to create a valve that suits your requirements. The common valve body for ICS Flexline™, ICM Flexline™ and ICLX Flexline™ is available in several different connection sizes. Different function modules offering you a very wide range of capacities to be installed in each valve body.

Easy installation and service

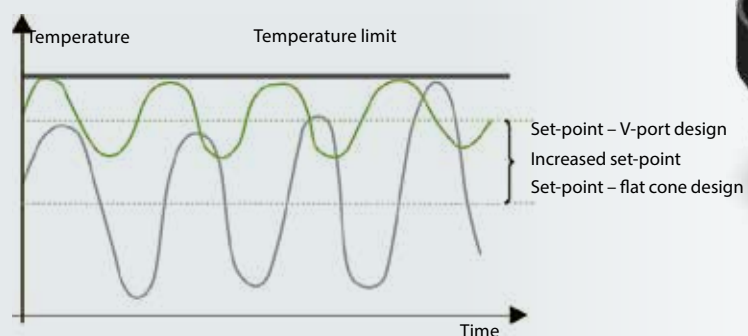
ICV Flexline™ valves are quick and simple to install. Due to their low weight and compact design they are easy to handle. The direct coupled connections reduce risk of leaks and require no use of flanges. Servicing is also made easy. For servicing the valves we offer several spare part kits to replace the worn parts inside the function module. Or you can simply replace the whole function module insert.

Ready for the refrigerants of the future

All ICV Flexline™ control valves are designed and tested to withstand a maximum working pressure of up to 52 bar (754 psi) in a media temperature range of $-60/+120^{\circ}\text{C}$ ($-76/+248^{\circ}\text{F}$), making them all suitable for the natural refrigerants ammonia and CO_2 and other future high pressure refrigerants. The high pressure rating provides you with unmatched freedom when designing your applications.

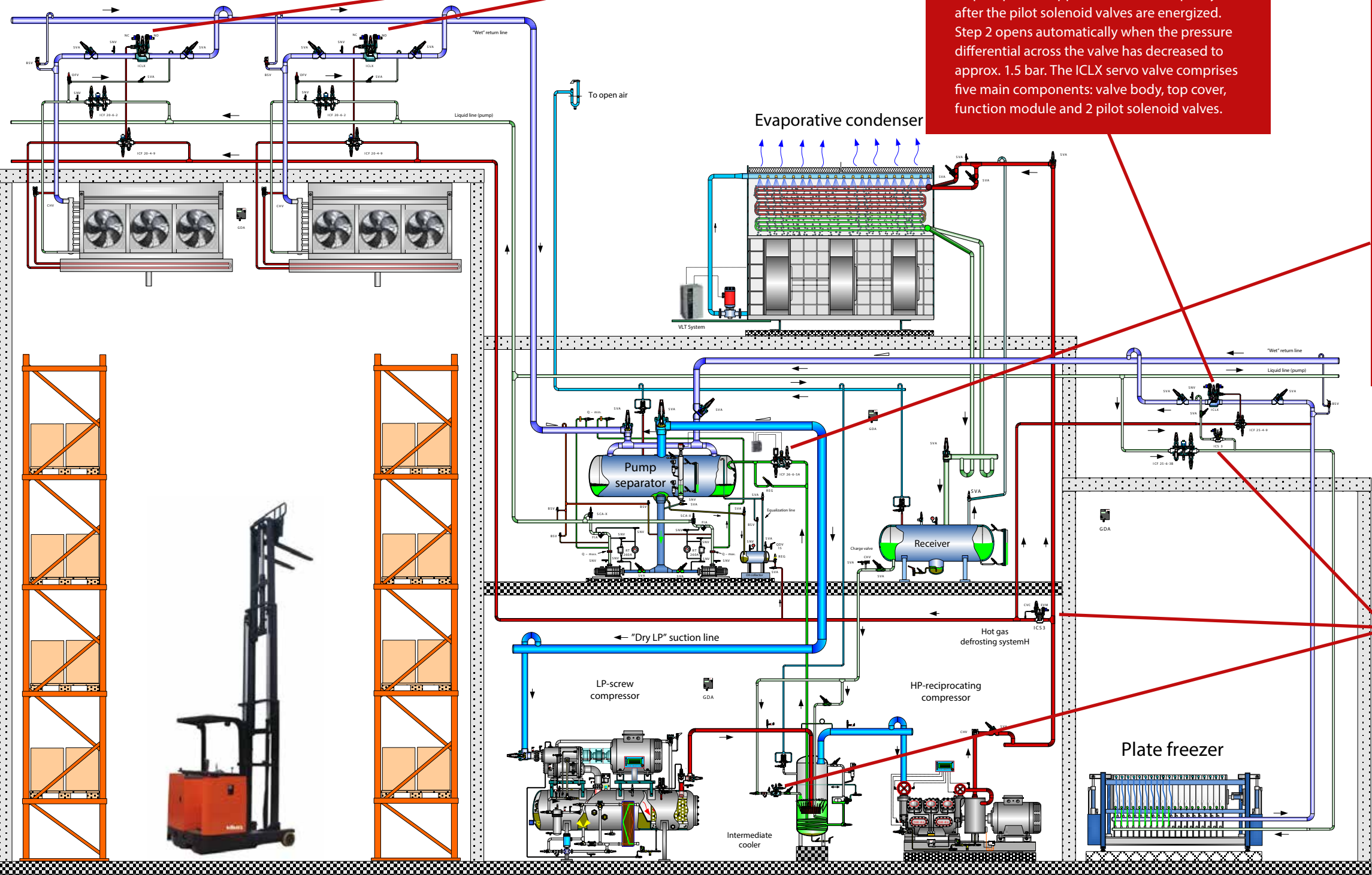
High regulation performance with the unique valve port regulating cone

The special V-port design in the ICV Flexline™ regulating cone provides stable and smooth control characteristics compared to valves having a traditional flat port design. It enables the temperature set - point to be adjusted to a higher level, which provides a higher suction pressure, and a much better COP, ultimately leading to significant energy savings.



One stop shop

Whatever your industry, Danfoss Industrial Refrigeration can tailor an industrial refrigeration solution that works best for you. We deliver customer-driven innovations based on deep industrial refrigeration industry knowledge. Apart from ICS, ICLX and ICM products Danfoss is your one stop shop for all of your industrial refrigeration requirements including industrial automation components, stainless steel valves and spare parts.



Cold Store

Machinery Room

Plate freezer Production

ICLX

ICLX valves are used in suction lines for the opening against high differential pressure, e.g. after hot gas defrost in large industrial refrigeration systems with ammonia, fluorinated refrigerants or CO₂. The ICLX valve is factory configured to open in 2 steps. By following a simple procedure the valve can be configured to open in 1 step only. In 2-step configuration, step 1 opens to approx. 10% of the capacity after the pilot solenoid valves are energized. Step 2 opens automatically when the pressure differential across the valve has decreased to approx. 1.5 bar. The ICLX servo valve comprises five main components: valve body, top cover, function module and 2 pilot solenoid valves.



ICM

ICM is a very compact, direct operated motor valve. ICM valves are designed to regulate an expansion process in liquid lines with or without phase change or control pressure or temperature in dry and wet suction lines and hot gas lines. ICM valves are designed so that the opening and closing forces are balanced, therefore, only three sizes of ICAD actuators are needed for the complete range of ICM from DN 20 to DN 150. The ICM motorised valve and ICAD actuator assembly offers a very compact unit with small dimensions. An ICM motor valve comprises three main components: a valve body, a combined function module/top cover and an ICAD actuator.



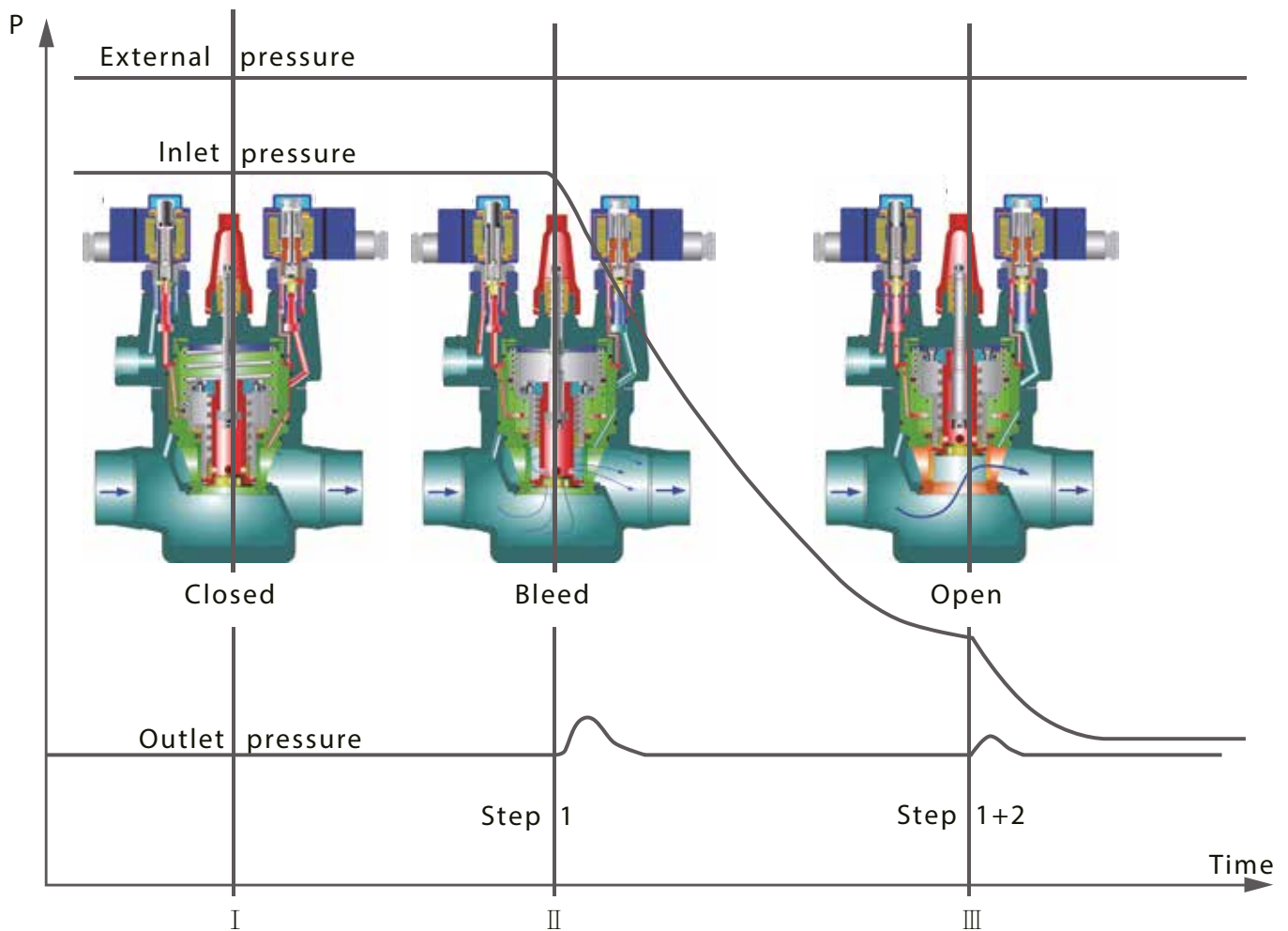
ICS

ICS is a compact, servo operated control valve. The valves are suitable for regulating pressure, temperature and ON/OFF functions in refrigeration systems. They can be used on both the low and the high pressure side, in dry and wet suction lines and in liquid lines without phase change (i.e. where no expansion takes place in the valve). An ICS valve comprises three main components: a valve body, a function module and a top cover. It is multifunctional, where several pilot valves can be mounted into the pilot ports.



ICLX two-step servo-operated main valve

The Danfoss ICLX valves are 2-step servo-operated main valves with pilot solenoid valves. From DN 32 up to DN 150, ICLX valves use an external pressure connection for opening (which means that no opening pressure difference across the ICLX valve is required).



Two step process:

- Step one opens to 10% of the capacity, when the pilot solenoid valves are activated
- Step two opens automatically after the pressure differential across the valve reaches 1.25 bar

Integration

ICAD actuators featuring high speed digital stepper motor technology

ICAD actuators ensure a fast response and accurate positioning of the ICM Flexline™ valve's opening. You can continuously monitor the opening degree of the ICM Flexline™ valve and by using the manual programming keys easily programme the ICAD to suit your requirements.

Some of the unique features of ICAD:

- Patented magnet coupling
- Analog input: 0/2-10V, 0/4-20mA
- ON/OFF solenoid operation with different speed possibilities (slow opening/fast closing)
- Inverse operation
- ICAD comes with an encoder including an optimal counter device.

The encoders ensure real-time feedback of the valve position. It will generate an alarm in case of valve blockage. If a lost step is detected, the torque will automatically be increased. The IIFC (Intelligent Force Compensation) guarantees compensation for large pressure pulsations.

ICM



Electronic controllers and transmitters

Danfoss can supply a wide range of dedicated electronic controllers that can be used to control your ICV Flexline™. With these controllers you can increase your system efficiency.

- Liquid level controller, EKE 347
- Superheat controller, EKC 315A
- Discharge temp. controller, EKC 319
- PLC/Computer interface, EKC 366
- Media temp. controller, EKC 361
- Temperature sensor, AKS 12
- Float switch, AKS 38
- Pressure transmitters, AKS 32/33
- Liquid level transmitters, AKS 4100/4100U

AKS 4100



EKE 347



See them all on our web site
www.danfoss.com/ir

Danfoss Industrial Refrigeration

A world of expertise at the click of a button

Turn to Danfoss if you want to combine quality components with expert knowhow and support. Try out these free tools, designed to make your work much easier.



Coolselector® 2 – New calculation software for Industrial Refrigeration

Coolselector®2 is your brand new Danfoss calculation and selection software designed to make selection processes for all industrial refrigeration projects easier and less time consuming. Coolselector® 2 is a unique calculation and support tool for contractors and system designers, offering complete pressure drop calculations, analysis of pipe and valve design and the ability to generate performance reports. It replaces the well-known DIRcalc™ software and offers several new functionalities.



Danfoss IR app

The free IR App gives you a spare parts tool, which makes it easy for you to find the spare part number for a given Danfoss industrial refrigeration valve. It also presents all the products and benefits of the SVL Flexline™ range – with a fun game thrown in as well.



Download 3D CAD symbols

From our online product catalogue on our website, you can download 3D CAD symbols and illustrations to help you when designing refrigeration plants.



IR application tool

With this interactive PowerPoint slideshow, you can explore all the details of a two-stage ammonia plant. You will find detailed cut-away drawings and information on the valves in the installation along with links to videos, literature and product animations.



Application handbook

The Application Handbook is designed to help you every step of the way when working with industrial refrigeration systems. Among many other things, it contains examples of how to select control methods for different refrigeration systems, their design and which components to choose.

Visit **www.danfoss.com/IR-tools** and find all the tools you need.