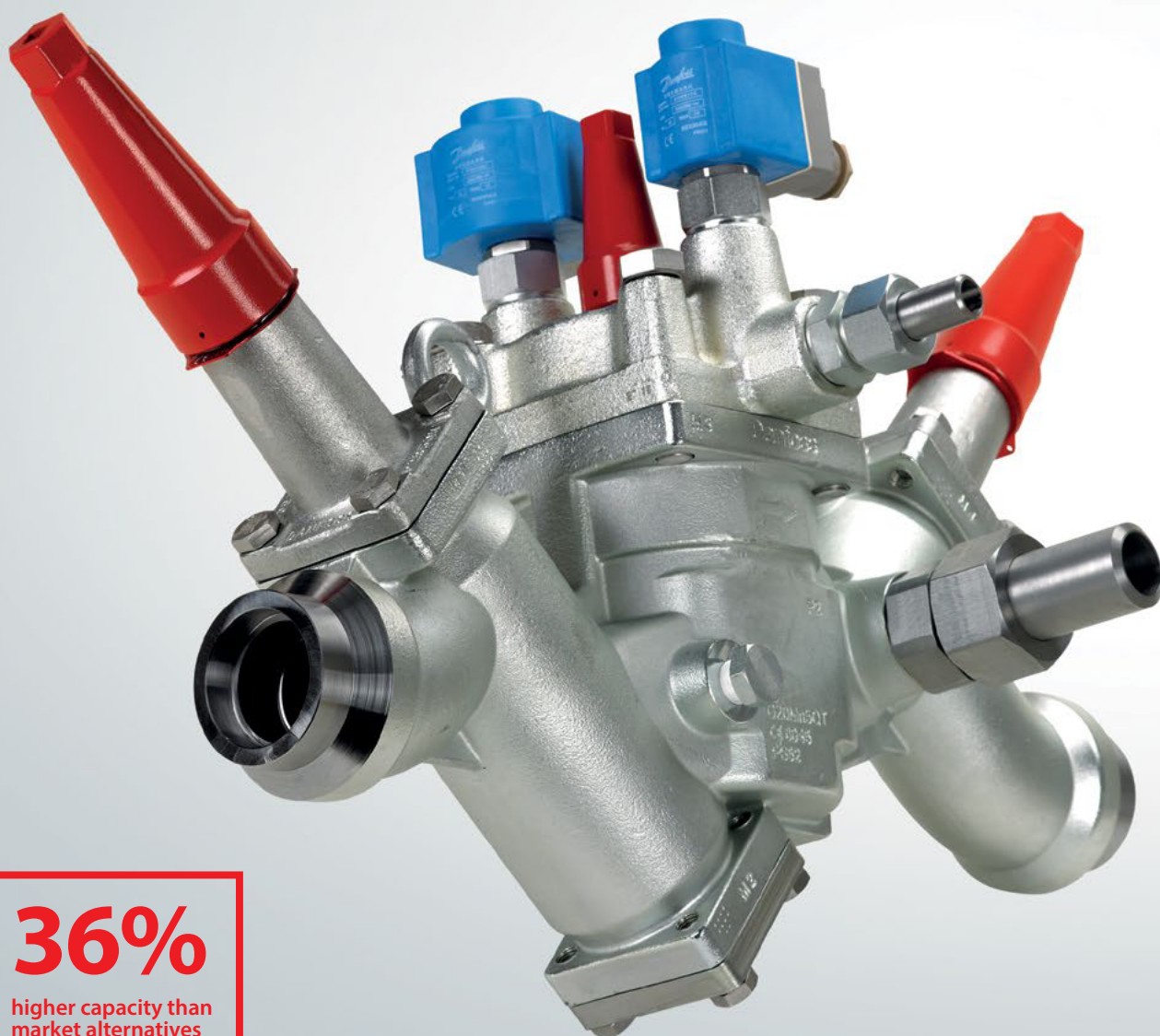


ENGINEERING
TOMORROW



New ICF 50-4 and ICF 65-3: A **great** valve family just got greater

Danfoss extends its successful ICF Flexline™ valve range to include DN 50 and DN 65 sized ICF valves for industrial refrigeration systems



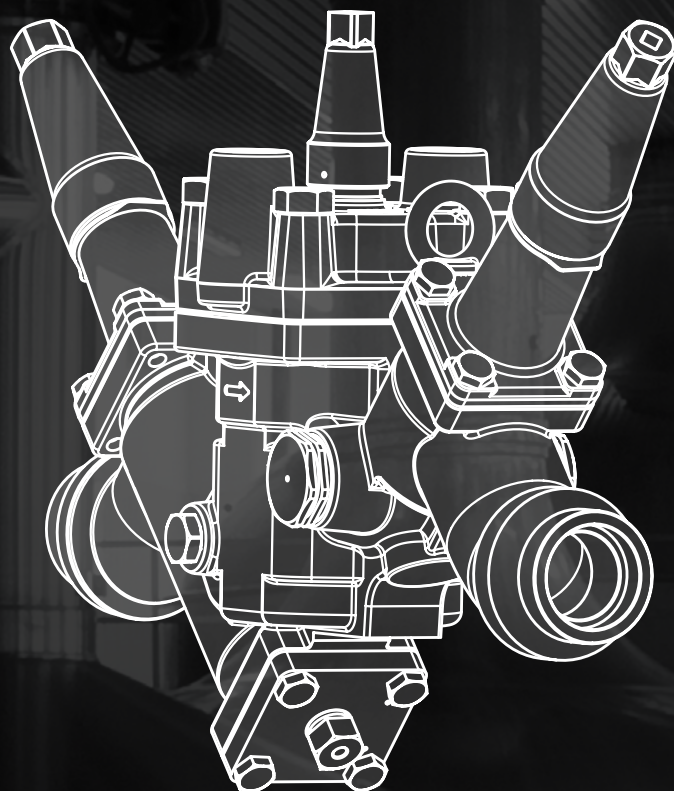
36%

higher capacity than
market alternatives

Benefits you can count on

86%

lower pressure drop



■ Much higher capacity and lower pressure drop

Independent tests at the Danish Technological Institute show that the ICF 50-4 has a 36% higher capacity than other valve types for the same use. At the same cooling capacity, comparable valves in the market will create a pressure drop 86% higher than the new Danfoss ICF 50-4.

■ Defrost connection saves time and optimizes the valve insulation

The ICF 50-4 and ICF 65-3 have a built-in option for you to connect the defrost drain line directly to the valve via the defrost connections. The defrost connections are located on either side of the valve for easy access.

■ Increased safety and lifetime of valves and system

The self-acting two-step solenoid valve (ICLX) increases your system safety as you avoid pressure shocks after defrost. Its smooth operation increases your valve and system lifetime and reduces the service costs.

■ Saving energy and reducing your environmental impact

The low pressure-drop over the ICF valve station gives you significant energy savings – let your local Danfoss representative help you calculate just how much you can save.

■ Engineering simplified

One ICF valve station with several configurations and functions makes design and installation faster and simpler. You can also reduce the number of products you need to stock, which in turn makes planning and ordering much simpler.

■ Increased system performance

Quick and easy pump down will reduce downtime during servicing. At the same time it reduces the leak risk and improves system safety.

■ Compact size and fewer weldings

The ICF is a compact valve station with far fewer weldings than a conventional valve station. In fact you can save up to 6 weldings. The compact size is a clear benefit where space constraints are high.

■ Better use of resources equals stronger cash flow

Because the ICF comes as a complete valve station, you don't have to invest time and money in the workshop disassembly, welding and pre-assembly hours. You only have to connect the valve at the site with 2 welds. This way you save up to 6 welds and handling time. Hence your installation cost is brought much closer to payment giving a better cash flow.

■ Future refrigerants welcome

All ICF Flexline™ valves are of course approved for ammonia (NH₃), CO₂, HCFC and non-flammable HFC. And with a pressure approval of 52 bar the valve can also be used for high pressure applications like heat pumps and hot gas defrost lines in CO₂ systems.

■ Tried and tested technology with global support

A decade of successfully installed ICF Flexline™ across the globe gives us a strong experience platform – and our experience is yours, too. Plus, when working with Danfoss, you can rely on our professional and dedicated global support when the need arises.

■ Support tools available to you

The Danfoss DIRbuilder™ and Coolselector®2 tools allow you to quickly and safely choose from a number of valve configurations. As a Danfoss customer, all our dimensioning tools are made available to you free of charge. And if you need our support for dimensioning and valve selection we are of course at your service.

Bringing the **ICF Flexline™** portfolio to the next level

The ICF valve concept engineered by Danfoss has become a major success in the industrial refrigeration industry over the past decade. It has inspired our customers to think in new, future-proof and far more efficient ways when designing refrigeration systems.

Range completed

Now, Danfoss expands the ICF family upwards in scale and capacities to cover applications where large dimensions are needed. The new ICF 50-4 and ICF 65-3 valves are optimized for

suction and hot gas line applications. They allow you to comfortably choose the market-leading supplier of industrial refrigeration components in every aspect of your installation.

All the experience and all the benefits of dealing with Danfoss as your one-stop-shop are available to you, whatever the size of your installation.



New large ICF product offerings

The new large ICF valves are available with a range of functions and regulation combinations as well as a number of popular connection types and sizes. The table below gives you a quick overview of product availability and overall specifications. For more

detail please see our technical literature on these products.

For easy access to the technical literature please visit our website dedicated to the ICF product range: www.danfoss.com/ICF

Refrigerants:
Applicable to HCFC, non-flammable HFC, NH₃ and CO₂

Max Working Pressure (MWP):
52 bar (754 psi)

Temperature range:
-60/+120° C (-76/+248° F)

ICF 50-4

Function		Regulation method	Function	Connection types and sizes
Stop valve – SVA-S	Strainer option – FIA*	Servo operated – ICS Motor operated – ICM Two step solenoid – ICLX	Stop valve – SVA-S Regulation valve – REG-SB	DIN Butt weld 40 mm (1 1/2 in.) ANSI Socket weld 40 mm (1 1/2 in.) DIN Butt weld 50 mm (2 in.) ANSI Socket weld 50 mm (2 in.)

* Please observe that strainer insert is not included

ICF 65-3

Function		Regulation method	Function	Connection types and sizes
Stop valve – SVA-S	(NO strainer)	Servo operated – ICS Motor operated – ICM Two step solenoid – ICLX	Stop valve – SVA-S Regulation valve – REG-SB	DIN Butt weld 65 mm (2 1/2 in.) ANSI Butt weld 65 mm (2 1/2 in.) DIN Butt weld 80 mm (3 in.) ANSI Butt weld 80 mm (3 in.)

A **flexible** valve solution

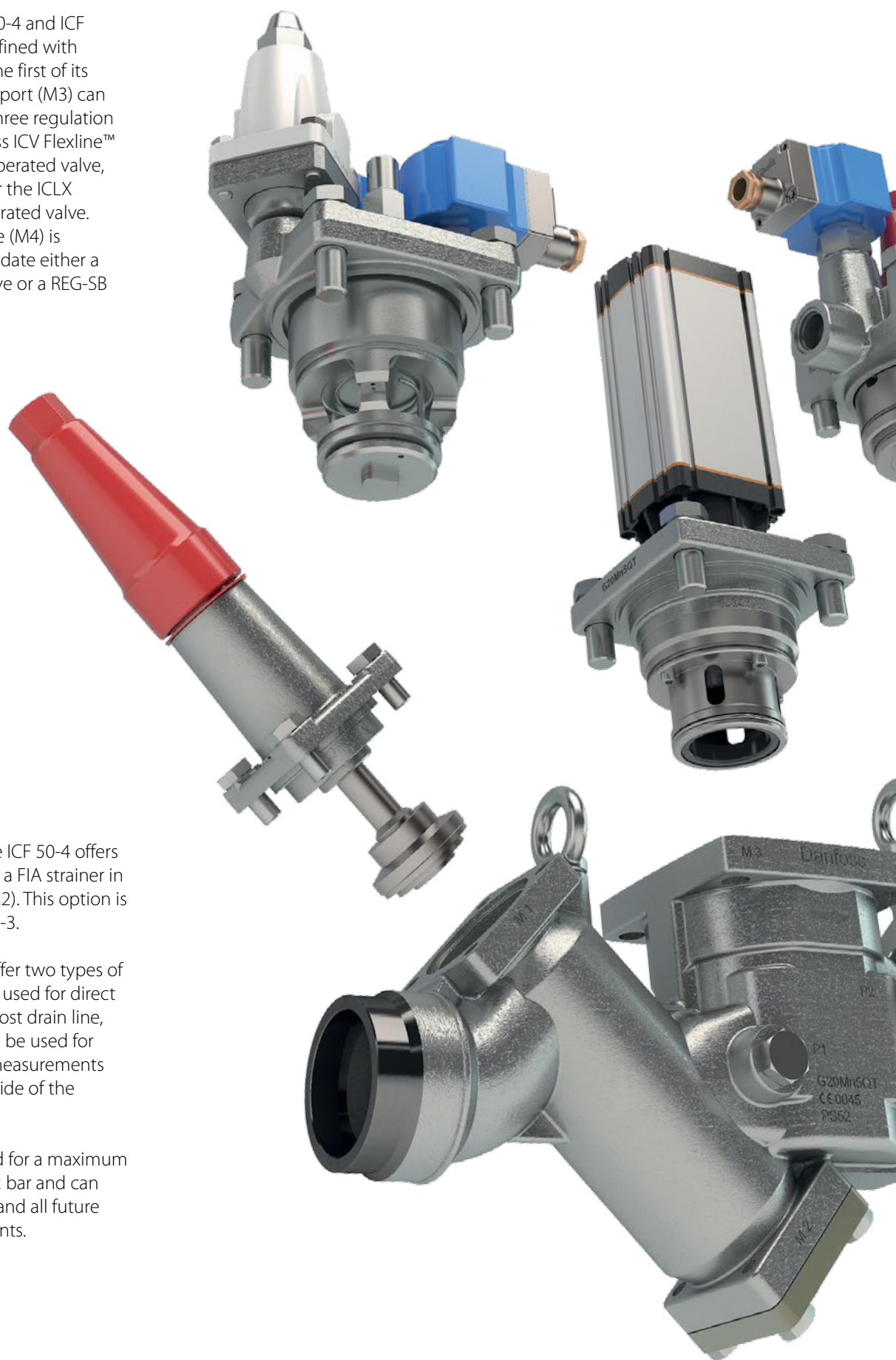
The new ICF 50-4 and ICF 65-3 fit suction lines, hot gas and defrost lines with ease. The unique ICF Flexline™ concept lets you install different function inserts in the same valve housing.

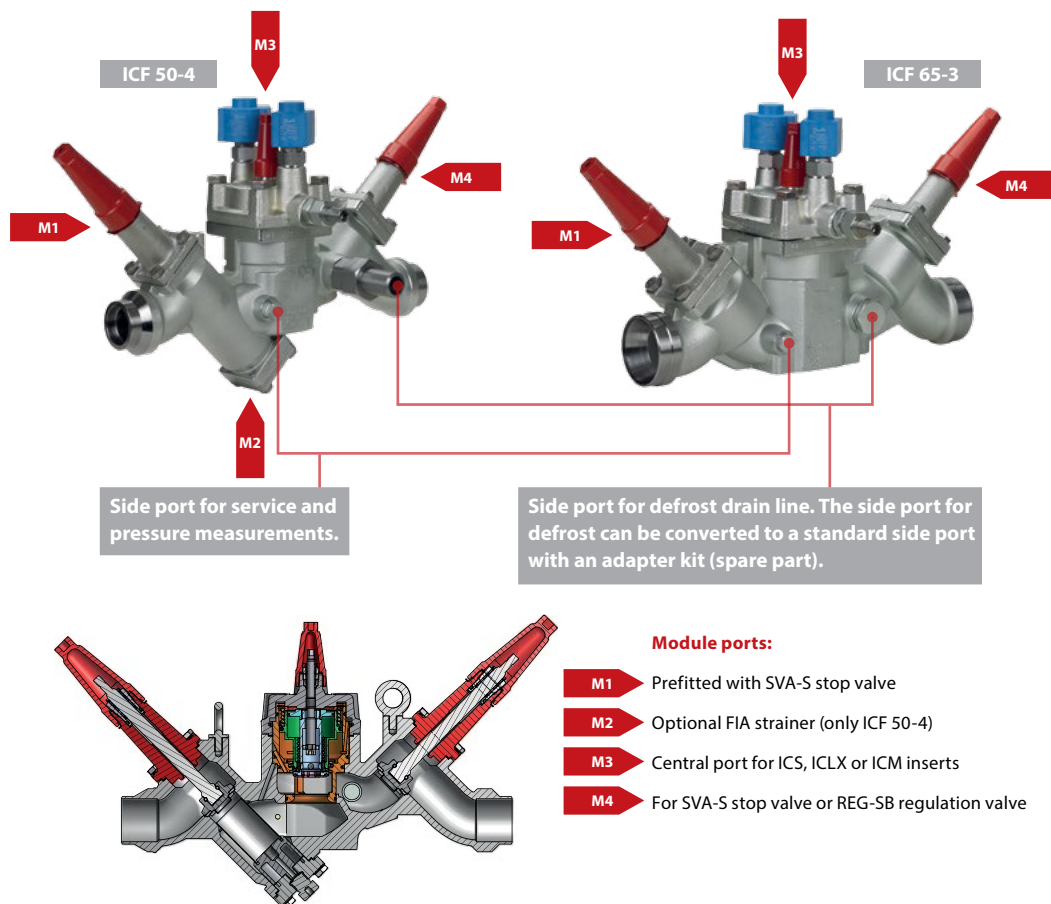
Common for the ICF 50-4 and ICF 65-3 is they are pre-defined with a SVA-S stop valve in the first of its modules (M1). Central port (M3) can be fitted with one of three regulation valves from the Danfoss ICF Flexline™ range: The ICS servo operated valve, the ICM motor valve or the ICLX two-step solenoid operated valve. And the fourth module (M4) is designed to accommodate either a second SVA-S stop valve or a REG-SB regulation valve.

As a special feature the ICF 50-4 offers the option of inserting a FIA strainer in the second module (M2). This option is not available on ICF 65-3.

Both valve housings offer two types of side ports. One can be used for direct connection of the defrost drain line, and the other port can be used for service and pressure measurements (one of each on each side of the housing).

All inserts are designed for a maximum working pressure of 52 bar and can efficiently handle CO₂ and all future high pressure refrigerants.





Making industrial refrigeration systems simpler

The ICF concept makes the design and installation of a refrigeration system far easier and much less prone to error. With just one valve housing, you get fewer welds, and fewer welds mean fewer potential leak points.

Space-saver

When you replace three or four different valves with just one, you save space. This is a direct and palpable benefit where space is limited, e.g. on board fishing vessels and in confined food handling or production facilities.

Selecting your regulation method

In module 3 you have the option to choose between ICS servo operated, ICM motor operated or ICLX two-step solenoid valves.

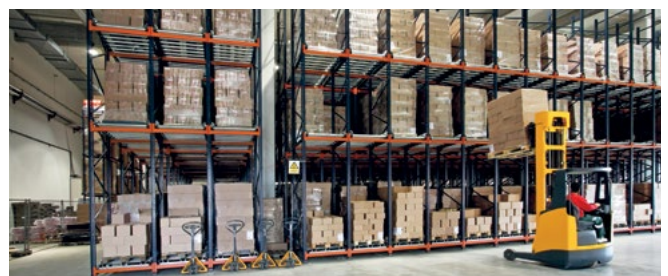
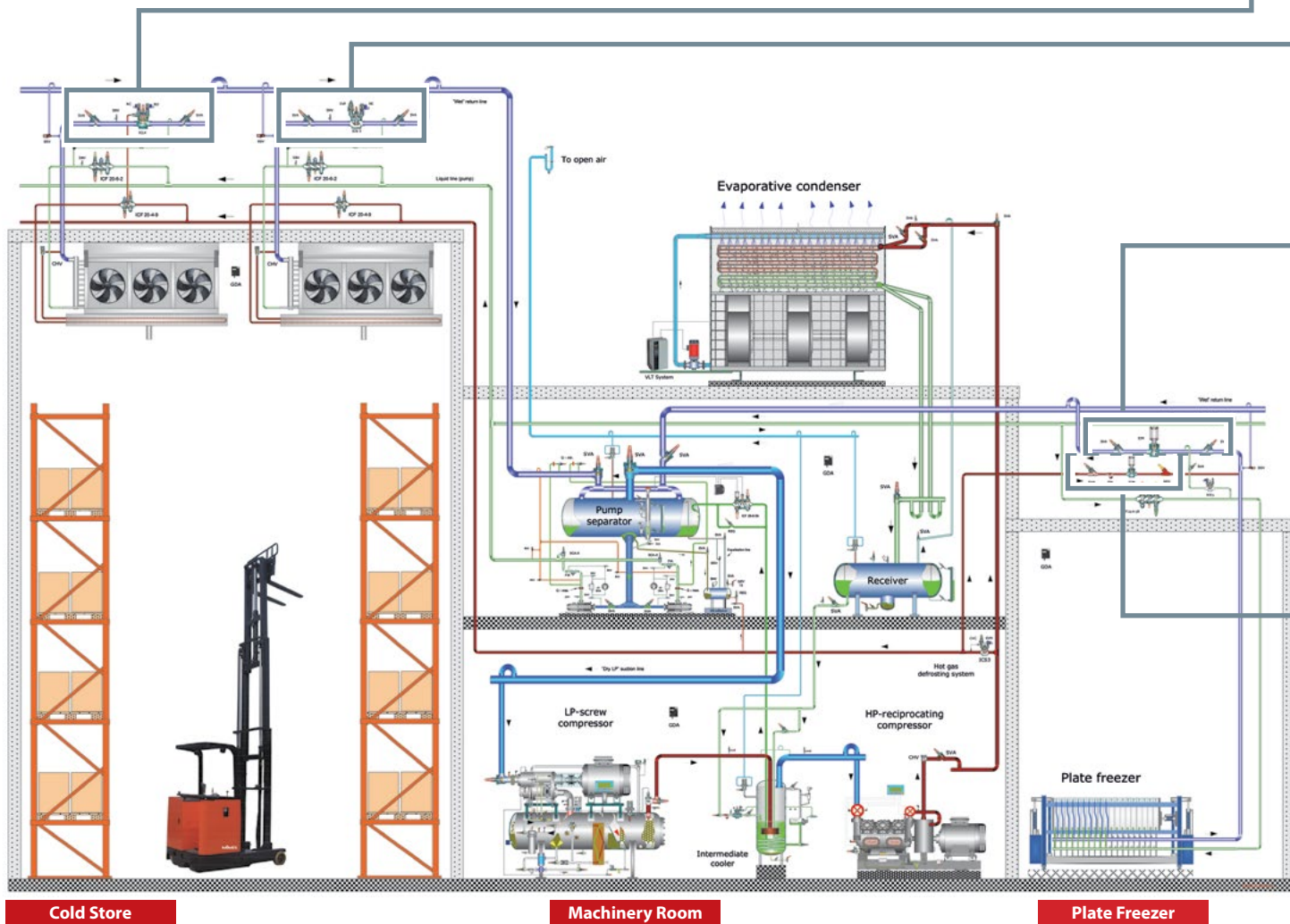
Module 3 options (Regulation method)		Description
Servo operated	ICS 50	ICS 50 module (100% capacity)
	ICS 50-32	ICS module that offers the same capacity as a ICS 32 insert
	ICS 50-40	ICS module that offers the same capacity as a ICS 40 insert
Motor operated	ICM 50 – A	To be used in liquid and hot gas lines
	ICM 50 – B	To be used in suction lines
Two-step solenoid	ICLX 50	ICLX 50 module
Servo operated	ICS 65	ICS 65 module (100% capacity)
	ICS 65-40	ICS module that offers the same capacity as a ICS 40 insert
	ICS 80	ICS 80 module
Motor operated	ICM 65 – A	To be used in liquid and hot gas lines
	ICM 65 – B	To be used in suction lines
Two-step solenoid	ICLX 65	ICLX 65 module

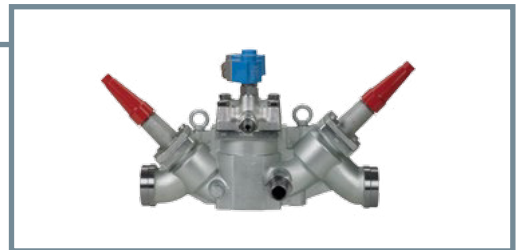
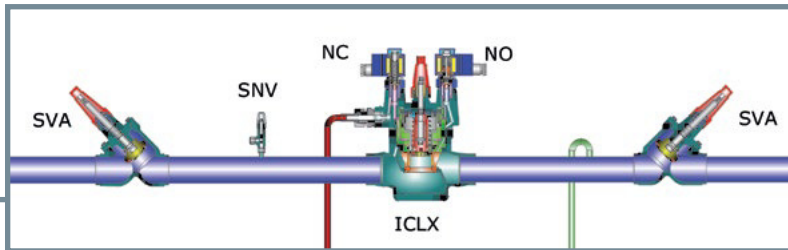
Energy and safety in focus

The ICF concept can do much more than save you money on your installation and servicing bills. It can directly reduce your operational costs by helping you make much more of a pricey commodity: Energy. The low pressure drops across the Danfoss ICF valve will cut energy spending, lowering your operational costs and making your environmental footprint smaller. The ICLX valve with its self-acting two-step solenoid function also increases your system safety as you avoid pressure shocks after defrost.

Better profitability with defrost return connection

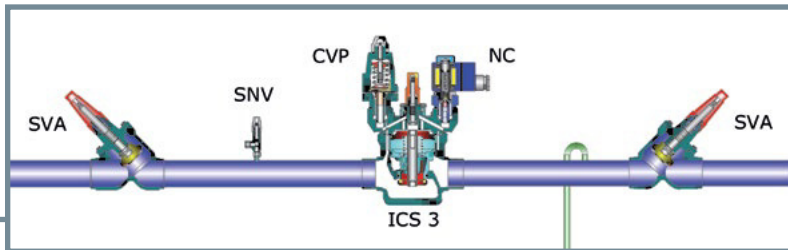
The large ICF valves give you the option of connecting the hot gas defrost line directly to the ICF. This will reduce the number of welds in the final installation and will help you achieve much better insulation of the defrost line. Better insulation equals better profitability.





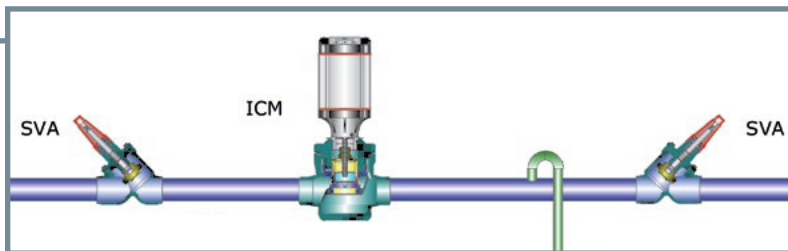
Suction line valve station with two-step solenoid valve

In this evaporator example you can replace the individual valves with an ICF 65-3 with SVA-S stop valve, ICLX two-step solenoid valve and SVA-S stop valve. This ICF solution saves you 5 weldings in this application.



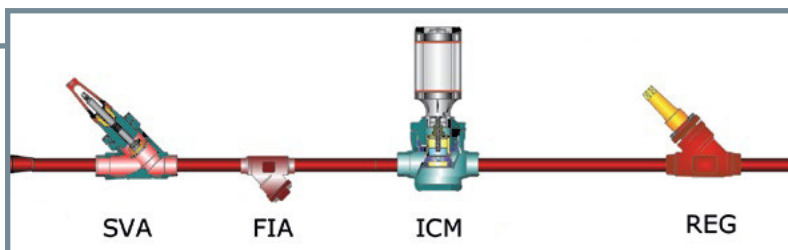
Suction line valve station with temperature control

In this evaporator example you can replace the individual valves with an ICF 65-3 with SVA-S stop valve, ICS servo operated control valve and SVA-S stop valve. This ICF solution saves you 5 weldings in this application.



Suction line valve station with motor operated valve

In this suction line example you can replace the individual valves with an ICF 65-3 with SVA-S stop valve, ICM motor valve and SVA-S stop valve. This ICF solution saves you 5 weldings in this application.



Hot gas line valve station with motor operated valve

In this hot gas line example you can replace the individual valves with an ICF 50-4 with SVA-S stop valve, FIA strainer, ICM motor valve and REG-SB hand expansion valve. This ICF solution saves you 4 weldings in this application.

More info?

Do you want to experience the benefits of the new ICF 50-4 and ICF 65-3 valve station? Contact your local wholesaler or your local Danfoss representative for more details.

For any technical queries please go to: www.danfoss.com/ICF or contact your local Danfoss sales office.

Simplify the design of your system and **save time and costs**

– Real value comes from time and cost savings

In your industry, like everyone else's, time is money

The modular ICF Flexline™ valve station will deliver solid advantages in terms of installation and servicing costs. You'll not just save time on installation and servicing while taking control of your costs, you'll free up your most vital resource, your people, to perform other more valuable tasks.

The ICF control solutions consist of a valve housing plus three to six function modules. Thanks to the modular concept you can tailor the functions you need for your application into the one valve, saving space and welding time.

The ICF Flexline™ product family consists of the following

ICF products	Nominal connections
ICF 15-4	15 mm (1/2 in.) and 20 mm (3/4 in.)
ICF 15 EVRAT	Flanged valve for retrofit
ICF 20 EVRAT	Flanged valve for retrofit
ICF 20-4	20 mm (3/4 in.), 25 mm (1 in.) and 32 mm (1 1/4 in.)
ICF 20-6	20 mm (3/4 in.), 25 mm (1 in.) and 32 mm (1 1/4 in.)
ICF 25-4	25 mm (1 in.), 32 mm (1 1/4 in.) and 40 mm (1 1/2 in.)
ICF 25-6	25 mm (1 in.), 32 mm (1 1/4 in.) and 40 mm (1 1/2 in.)
ICF 50-4	40 mm (1 1/2 in.) and 50 mm (2 in.)
ICF 65-3	65 mm (2 1/2 in.) and 80 mm (3 in.)

Benefits when using the ICF valve station

Engineering

- One code number – several valve functions
- Easy selection with Danfoss Coolselector®
- Easy system design with the free 3D symbol drawings from Danfoss
- The ICF Flexline™ valve stations are suitable for all common refrigerants including CO₂

Construction

- Just two welds for fast and efficient installation
- Direct weld flange free connections
- Fast welding – disassembly not necessary
- The need for insulation reduced due to the compact design of the ICF Flexline™ valve solution

Service

- Quick and efficient evacuation saves time and money
- The unique design makes it quick and easy to access the individual function modules during service
- Low internal volume – minimal refrigerant loss during service
- Rust inhibiting protection securing a long product life time



ICF 15-4



ICF 15 EVRAT



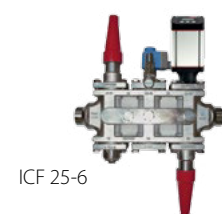
ICF 20-4



ICF 20-6



ICF 25-4



ICF 25-6



ICF 50-4



ICF 65-3