

## The ICF control solution

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**Introduction**

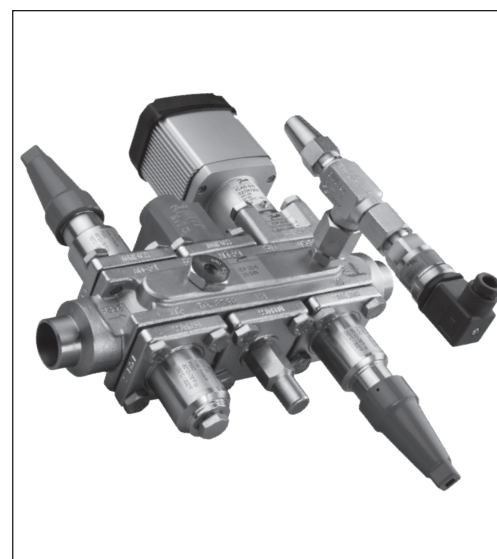
Based on advanced technology the new ICF control solution incorporates several functions in one housing, which can substitute a series of conventional mechanical, electro-mechanical and electronically operated valves.

This solution not only provides a number of advantages in the design phase of a refrigeration plant but also in the installation, service and maintenance.

The ICF solutions are designed for low and high pressure refrigerants and can be used in liquid lines, compressor injection lines and hot gas lines.

Supplied as a complete assembly, it is function and pressure tested under factory controlled conditions.

One code number equals one application solution.



**Features**

- Designed for industrial refrigeration applications for a maximum working pressure of 52 bar/754 psig.
- Applicable to all common non flammable refrigerants including R717, R744 (CO<sub>2</sub>) and non corrosive gases/liquids dependent on sealing material compatibility.
- Direct weld connections.
- Connection types include butt weld, socket weld.
- Low temperature steel housing.
- Low weight and compact design.
- V-port regulating cones on the control modules ensure optimum regulating accuracy particularly at part load.
- *Modular Concept*  
Each housing is available with several different connection types and sizes. Valve service is performed by replacing the function module.
- The housing comprises the option for side port connections for the inclusion of pressure gauges, transmitters, sight glasses, etc.



ICF control solution		
Nominal bore	DN ≤ 25 (1 in.)	DN 32-40 (1 ¼ - 1 ½")
Classified for	Fluid group I	
Category	Article 3, paragraph 3	II

**Technical data**

- *Refrigerants*  
Applicable to all common non flammable refrigerants including R717, R744 (CO<sub>2</sub>) and non corrosive gases/liquids dependent on sealing material compatibility.  
  
For further information please refer to installation instruction for ICF.  
  
Flammable hydrocarbons are not recommended. For further information please contact the local Danfoss sales company.
- *Temperature range*  
-60/+150°C (-76/+302°F).  
ICF with ICM/ICAD: +120°C (+248°F)
- *Surface protection*  
The external surface is zinc-chromated to provide corrosion protection.
- *Pressure*  
The ICF is designed for:  
Max. working pressure: 52 bar g (754 psig)  
  
*Opening differential pressure:*  
Please refer to the individual function module data.

**Design**

The main components of the ICF solution are:

- A housing
- A maximum of four or six function modules

*Housing*

**There are two housing variants:**

<p style="text-align: center;"><i>ICF with 4 module ports</i></p> <div style="text-align: center;"> <p><b>4 module ports</b> (2 on top and 2 in the bottom)</p> <p><b>0, 2 or 4 optional side ports</b> (up to 6 on request)</p> </div> <p><i>The ICF housing includes:</i></p> <ul style="list-style-type: none"> <li>- Module ports M1 to M4</li> <li>- Side ports P1 to P6</li> </ul>	<p style="text-align: center;"><i>ICF with 6 module ports</i></p> <div style="text-align: center;"> <p><b>6 module ports</b> (3 on top and 3 in the bottom)</p> <p><b>0, 4 or 6 optional side ports</b> (up to 10 on request)</p> </div> <p><i>The ICF housing includes:</i></p> <ul style="list-style-type: none"> <li>- Module ports M1 to M6</li> <li>- Side ports P1 to P10</li> </ul>
--	--

*Function modules*

**Each housing accommodates a maximum of four or six function modules, of the following types:**

- Stop valve module
- Manual regulating valve module
- Filter module
- Solenoid valve module
- Electronic expansion valve module
- Manual opening module
- Check valve module
- Stop/check valve module
- Motor valve module
- External welding connection module
- Blank top cover

*Optional:*

- The housing can be supplied with a maximum of six or ten side ports for the following:
- Sight glass
  - Temperature or pressure sensor
  - Pressure gauge
  - Side exit for drain or bypass.

The design allows maximum capacity and minimum pressure drop, using advanced technology and double seats – offering higher capacity than conventional systems using individual valves and components.

The ICF solution is multifunctional.

ICF solution offers compact dimensions and shortened installation time due to the reduced number of direct welded connections.

Supplied as a complete assembly, it is function and pressure tested under factory controlled conditions.

*Connections*

*There is a very wide range of connection types available with ICF solutions:*

- D: Butt weld, DIN (EN 10220)
- A: Butt weld, ANSI (B 36.10)
- SOC: Socket weld, ANSI (B 16.11)

*Approvals*

The ICF concept is designed to fulfil global refrigeration requirements.

For specific approval information, please contact Danfoss.

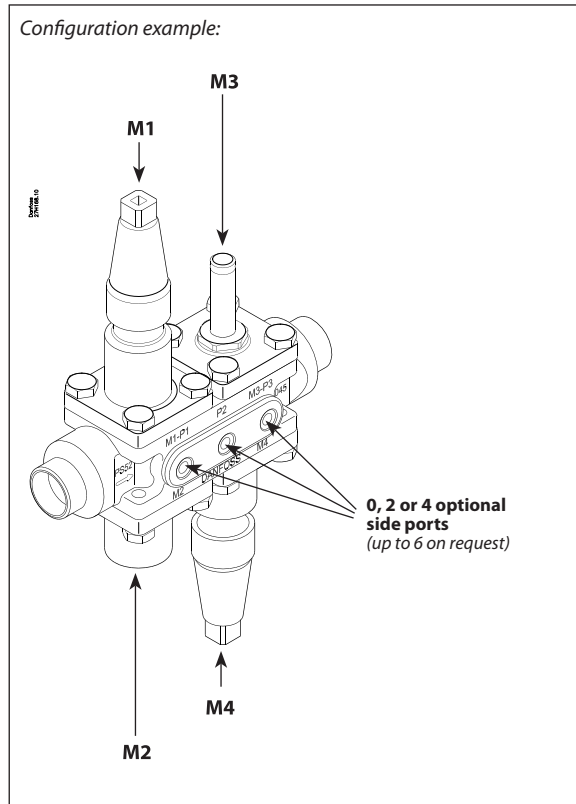
*Housing and function module material*

Low temperature steel

**When using TIG/MIG welding technology, it is possible to install the ICF solution without prior removal of the function modules from the housing. If using other welding methods the modules must be disassembled.**

Possible location of the function modules

### ICF 20-4

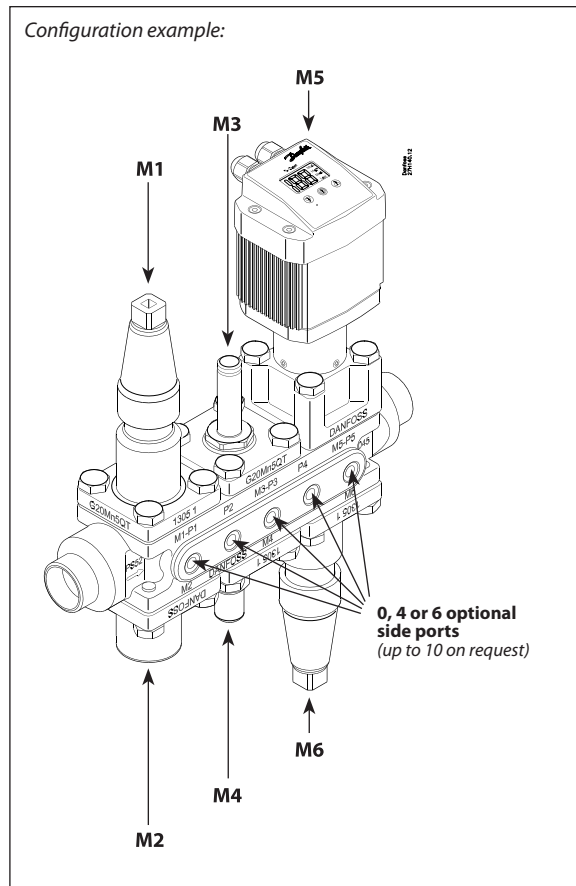


In order to supply the ICF solution best suited for liquid lines and hot gas lines certain function modules are dedicated to specific module ports.

Function	M1	M2	M3	M4
ICFS 20 - Stop valve module				
ICFR 20A - Manual regulating valve module				
ICFF 20 - Filter module	X		X	
ICFE 20 - Solenoid valve module	X	X	X	X
ICFA 10 - Electronic expansion valve module		X		X
ICFO 20 - Manual opening module	X	X	X	
ICFC 20 - Check valve module	X		X	
ICFN 20 - Stop/check valve module	X		X	
ICM 20-A, B or C - Motor valve module		X		X
ICFB 20 - Blank top cover				

location not possible

### ICF 20-6

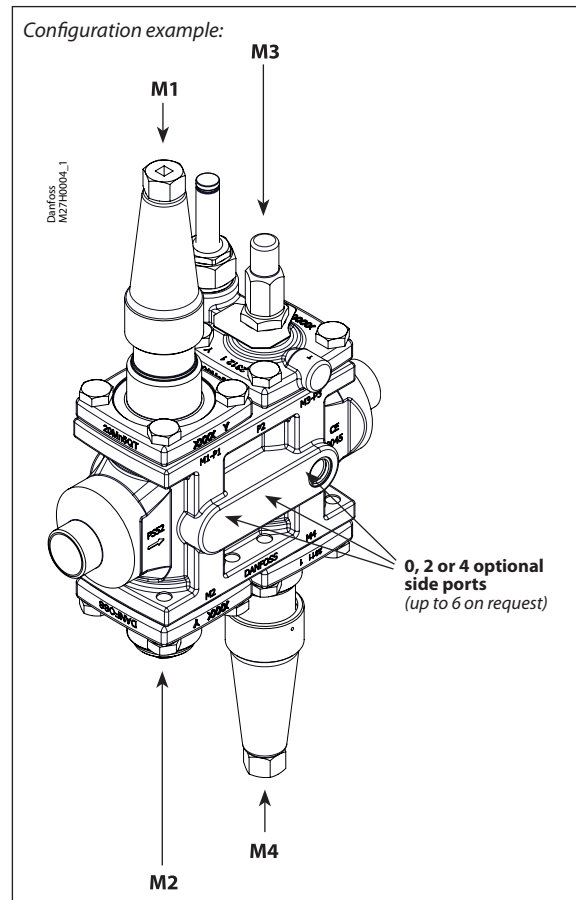


In order to supply the ICF solution best suited for liquid lines and hot gas lines certain function modules are dedicated to specific module ports.

Function	M1	M2	M3	M4	M5	M6
ICFS 20 - Stop valve module						
ICFR 20A - Manual regulating valve module						
ICFF 20 - Filter module	X		X			
ICFE 20 - Solenoid valve module	X	X	X	X	X	X
ICFA 10 - Electronic expansion valve module		X		X		X
ICFO 20 - Manual opening module	X	X	X	X		
ICFC 20 - Check valve module	X		X			
ICFN 20 - Stop/check valve module	X		X			
ICM 20-A, B or C - Motor valve module		X		X		X
ICFB 20 - Blank top cover						

location not possible

Possible location of the function modules

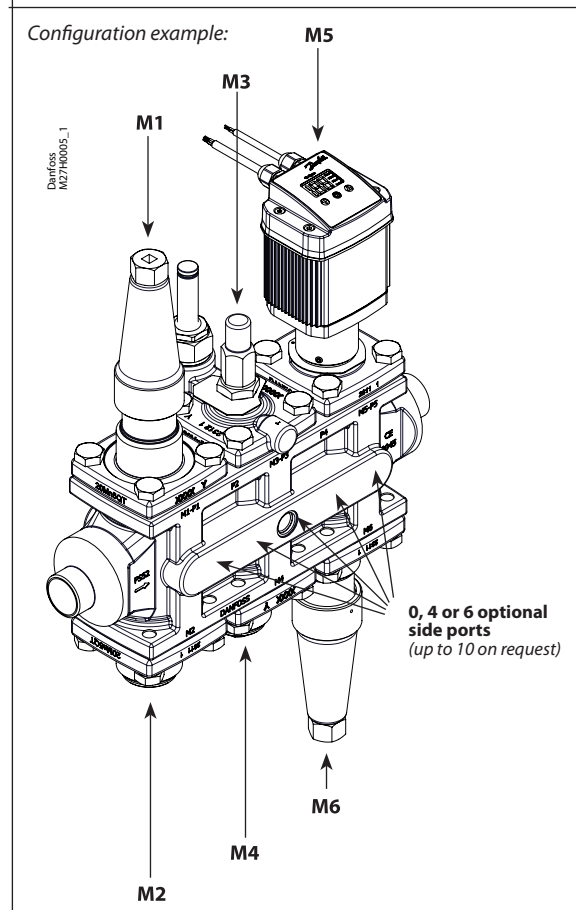


### ICF 25-4 → 40-4

In order to supply the ICF solution best suited for liquid lines and hot gas lines certain function modules are dedicated to specific module ports.

Function	M1	M2	M3	M4
ICFS 25-40 - Stop valve module				
ICFR 25-40 A or B - Manual regulating valve module				
ICFF 25-40 - Filter module	X		X	
ICFE 25-40 - Solenoid valve module	X		X	
ICFC 25-40 - Check valve module	X		X	
ICFN 25-40 - Stop/check valve module	X		X	
ICM 25-A or B - Motor valve module				X
ICFB 25-40 - Blank top cover				
ICFW 25-40 - Welding module, 25DIN				

location not possible



### ICF 25-6 → 40-6

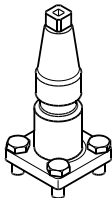
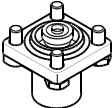
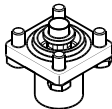
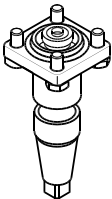
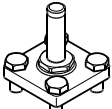
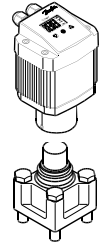
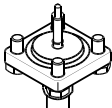
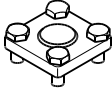
In order to supply the ICF solution best suited for liquid lines and hot gas lines certain function modules are dedicated to specific module ports.

Function	M1	M2	M3	M4	M5	M6
ICFS 25-40 - Stop valve module						
ICFR 25-40 A or B - Manual regulating valve module						
ICFF 25-40 - Filter module	X		X			
ICFE 25-40 - Solenoid valve module	X		X			
ICFC 25-40 - Check valve module	X		X			
ICFN 25-40 - Stop/check valve module	X		X			
ICM 25-A or B - Motor valve module					X	
ICFB 25-40 - Blank top cover						
ICFW 25-40 - Welding module, 25DIN						

location not possible

## ICF 20

Description of the function modules for ICF 20

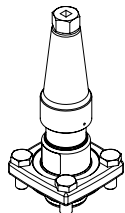
<p><b>ICFS 20</b> <i>Stop valve module</i> This module has the function of a stop valve.</p> <p><b>ICFR 20A</b> <i>Manual regulating valve module</i> This module has the function of a hand regulating valve.</p>	 <p>ICFS 20 / ICFR 20A</p>	<p><b>ICFC 20</b> <i>Check valve module</i> This module has the function of a check valve.</p>	 <p>ICFC 20</p>
<p><b>ICFF 20</b> <i>Filter module</i> This module has the function of a filter.</p> <p>The filter has a 150<math>\mu</math> mesh and a 50<math>\mu</math> internal run-in filter to be removed after start-up.</p>	 <p>ICFF 20</p>	<p><b>ICFN 20</b> <i>Stop/check valve module</i> This module has the function of a combined stop and check valve.</p>	 <p>ICFN 20</p>
<p><b>ICFE 20</b> <i>Solenoid valve module</i> This module has the function of a normally closed solenoid valve for controlling the refrigerant flow.</p> <p><b>ICFA 10</b> <i>Electronic expansion valve module</i> This module has the function of an electronic pulse width modulating (PWM) expansion valve.</p>	 <p>ICFE 20 / ICFA 10</p>	<p><b>ICM 20-A, B or C</b> <i>Motor valve module</i> This module is a stepper motor actuator valve for on/off and modulating control of the refrigerant flow.</p>	 <p>ICM 20-A, B or C</p>
<p><b>ICFO 20</b> <i>Manual opening module</i> This module facilitates the manual opening of the solenoid valve (type ICFE).</p>	 <p>ICFO 20</p>	<p><b>ICFB 20</b> <i>Blank top cover</i> This provides a blanking cover for unused module ports.</p>	 <p>ICFB 20</p>



## ICF 25-40

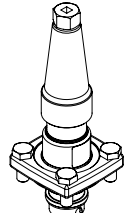
Description of the function modules for ICF 25-40

**ICFS 25-40**  
*Stop valve module*  
 This module has the function of a stop valve.



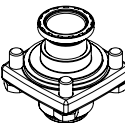
ICFS 25-40

**ICFR 25-40**  
*Manual regulating valve module*  
 This module has the function of a hand regulating valve.



ICFR 25-40

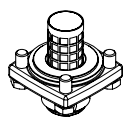
**ICFC 25-40**  
*Check valve module*  
 This module has the function of a check valve.



ICFC 25-40

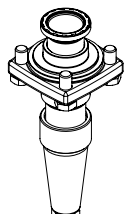
**ICFF 25-40**  
*Filter module*  
 This module has the function of a filter.

The filter has a 150 $\mu$  mesh and a 50 $\mu$  internal run-in filter to be removed after start-up.



ICFF 25-40

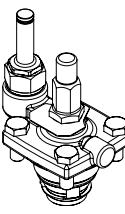
**ICFN 25-40**  
*Stop/check valve module*  
 This module has the function of a combined stop and check valve.



ICFN 25-40

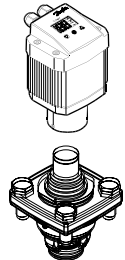
**ICFE 25-40**  
*Solenoid valve module*  
 This module has the function of a normally closed solenoid valve for controlling the refrigerant flow.

It has a build-in manual opening function.



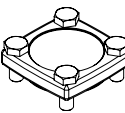
ICFE 25-40

**ICM 25-A or B**  
*Motor valve module*  
 This module is a stepper motor actuator valve for on/off and modulating control of the refrigerant flow.



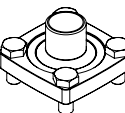
ICM 25-A or B

**ICFB 25-40**  
*Blank top cover*  
 This provides a blanking cover for unused module ports.



ICFB 25-40

**ICFW 25-40**  
*Welding module, 25 DIN*  
 This module is used for drain connection during hot-gas defrosting - in case of high capacity.



ICFW 25-40



Material specification

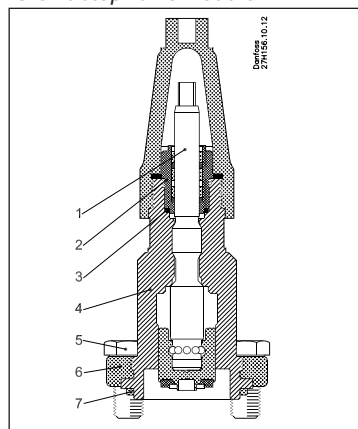
ICF housing

ICF 20-4, 25-4, 32-4, 40-4

ICF 20-6, 25-6, 32-6, 40-6

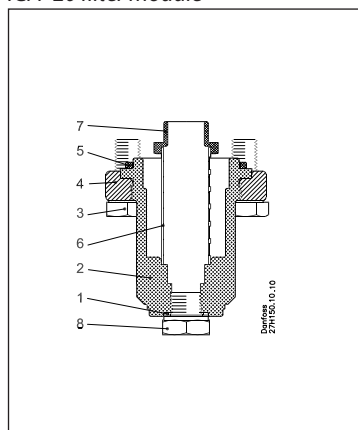
Pos.	Part	Material	EN	ASTM	JIS
1	Housing	Cast steel low temperature	G20Mn5QT EN 10213-3	LCC, A352	SCPL1, G5151

ICFS 20 stop valve module



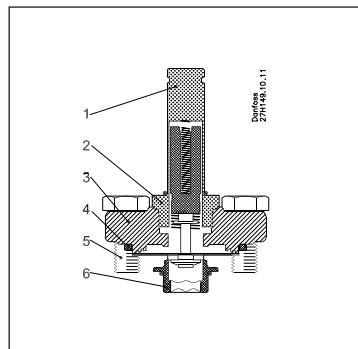
Pos.	Part	Material	EN	ASTM	JIS
1	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
2	Thread part	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
3	AL-gasket/ Refrig. gasket		AL99 alloy no. 1200 DIN 1712 BL.3		
4	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
5	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
7	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

ICFF 20 filter module



Pos.	Part	Material	EN	ASTM	JIS
1	Gasket	AL 99 F11			
2	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
3	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
4	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
5	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
6	Filter element	Steel 150µ + 50µ			
7	Plug	Steel			
8	Plug 1/4" RG for butt-weld 3/8" NPT for socket weld	Stainless steel	A2-70 EN 24017	A320	A2-70

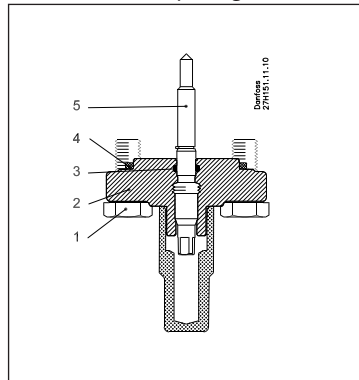
ICFE 20 solenoid valve module



Pos.	Part	Material	EN	ASTM	JIS
1	Armature tube	Stainless steel	X2CrNi19-11 EN 10088		
2	Armature tube nut	Stainless steel	X8CrNiS18-9 EN 10088		
3	Flange	Cast Steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
4	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
5	Hex-Head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Seat	High density polymer			

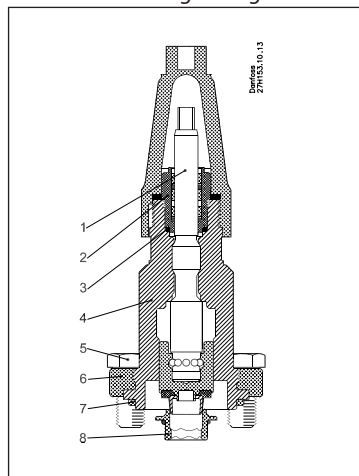
**Material specification**  
(continued)

*ICFO 20 manual opening module*



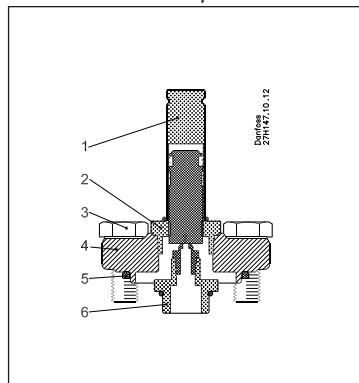
Pos.	Part	Material	EN	ASTM	JIS
1	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
2	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
3	O-ring	Chloroprene			
4	Rubber gasket	Chloroprene rubber			
5	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304

*ICFR 20 manual regulating valve module*



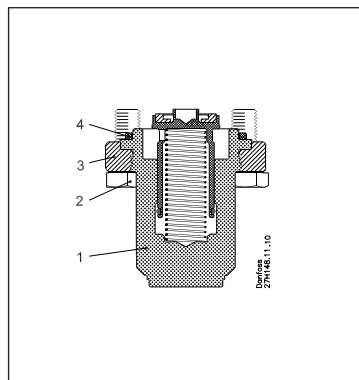
Pos.	Part	Material	EN	ASTM	JIS
1	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
2	Thread part	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
3	AL-gasket		AL99 alloy no. 1200 DIN 1712 BL.3		
4	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
5	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
7	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
8	Seat	High density polymer			

*ICFA 10 electronic expansion valve module*



Pos.	Part	Material	EN	ASTM	JIS
1	Armature tube	Stainless steel	X2CrNi19-11 EN 10088		
2	Armature tube nut	Stainless steel	X8CrNiS18-9 EN 10088		
3	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
4	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
5	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
6	Adaptor	Steel			

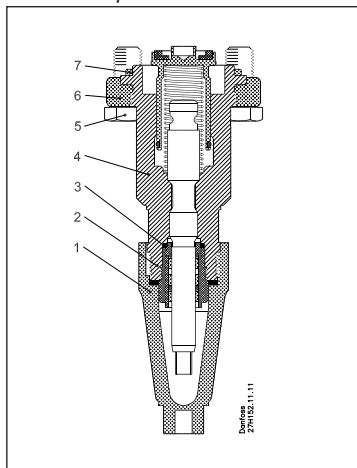
*ICFC 20 check valve module*



Pos.	Part	Material	EN	ASTM	JIS
1	Bonnet	Steel	S235JRG2	A283	G3101
2	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
3	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	AG5152
4	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

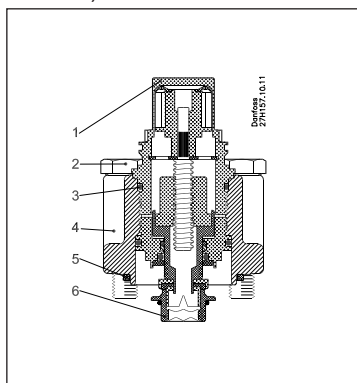
**Material specification**  
(continued)

*ICFN 20 stop/check valve module*



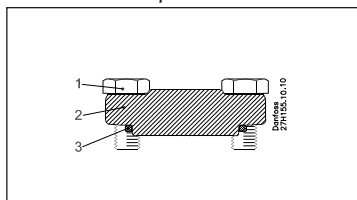
Pos.	Part	Material	EN	ASTM	JIS
1	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
2	Thread part	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
3	AL-gasket		AL99 alloy no. 1200 DIN 1712 BL.3		
4	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
5	Hex-head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
7	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

*ICM 20-A, 20-B or 20-C motor valve module*



Pos.	Part	Material	EN	ASTM	JIS
1	Adapter	Stainless steel	X5CrNi18-10 EN 10088	A240	G4303 G4304
2	Hex-head bolt M10 × 50	Stainless steel	A2-70 EN 24014	A320	A2-70
3	O-ring	Chloroprene			
4	Bonnet	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
5	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
6	Seat	High density polymer			

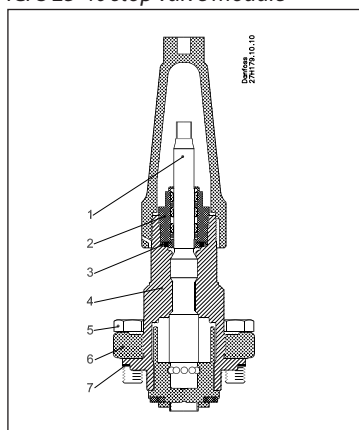
*ICFB 20 blank top cover*



Pos.	Part	Material	EN	ASTM	JIS
1	Hex-head bolt M10 × 25	Stainless Steel	A2-70 EN 24017	A320	A2-70
2	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
3	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

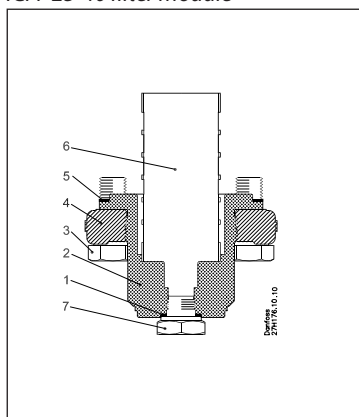
**Material specification**  
(continued)

*ICFS 25-40 stop valve module*



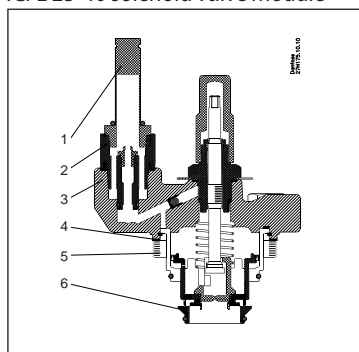
Pos.	Part	Material	EN	ASTM	JIS
1	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
2	Thread part	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
3	O-ring	Chloroprene			
4	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
5	Hex-head bolt M12 × 30	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
7	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

*ICFF 25-40 filter module*



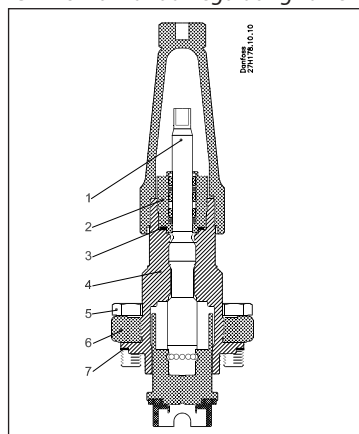
Pos.	Part	Material	EN	ASTM	JIS
1	Al. Gasket	AL 99 F11			
2	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
3	Hex-head bolt M12 × 30	Stainless steel	A2-70 EN 24017	A320	A2-70
4	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
5	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
6	Filter element	Steel 150µ + 50µ			
8	Plug 1/4" RG for butt-weld 3/8" NPT for socket weld	Stainless steel	A2-70 EN 24017	A320	A2-70

*ICFE 25-40 solenoid valve module*



Pos.	Part	Material	EN	ASTM	JIS
1	Armature tube	Stainless steel	X2CrNi19-11 EN 10088		
2	Armature tube nut	Stainless steel	X8CrNiS18-9 EN 10088		
3	Bonnet	Cast steel low temperature	G20Mn5QT EN10213-3	A352	G5152
4	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
5	Hex-Head bolt M10 × 25	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Seat	High density polymer			

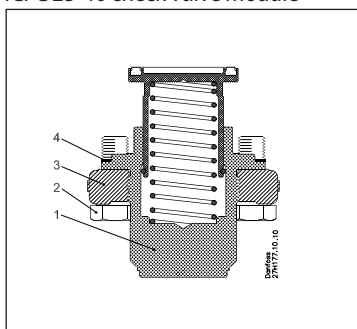
*ICFR 25-40 manual regulating valve module*



Pos.	Part	Material	EN	ASTM	JIS
1	Spindle	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
2	Thread part	Stainless steel	X8CrNiS 18-9 EN 10088		G4303 G4304
3	O-ring	Chloroprene			
4	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
5	Hex-head bolt M12 × 30	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
7	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
8	Seat	High density polymer			

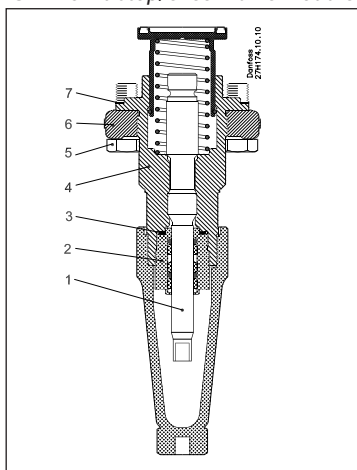
**Material specification**  
(continued)

*ICFC 25-40 check valve module*



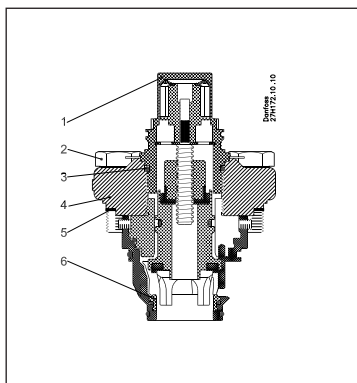
Pos.	Part	Material	EN	ASTM	JIS
1	Bonnet	Steel	S235JRG2	A283	G3101
2	Hex-head bolt M12 × 30	Stainless steel	A2-70 EN 24017	A320	A2-70
3	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	AG5152
4	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

*ICFN 25-40 stop/check valve module*



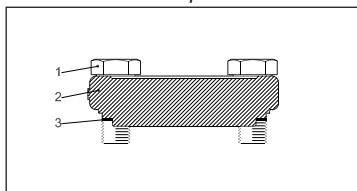
Pos.	Part	Material	EN	ASTM	JIS
1	Spindle	Stainless steel	X8CrNi5 18-9 EN 10088		G4303 G4304
2	Thread part	Stainless steel	X8CrNi5 18-9 EN 10088		G4303 G4304
3	O-ring	Chloroprene			
4	Bonnet	Steel	S235JRG2 EN 10025	A283	G3101
5	Hex-head bolt M12 × 30	Stainless steel	A2-70 EN 24017	A320	A2-70
6	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
7	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

*ICM 25-A or B motor valve module*



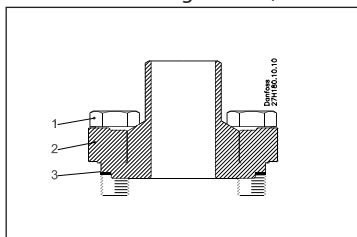
Pos.	Part	Material	EN	ASTM	JIS
1	Adapter	Stainless steel	X5CrNi18-10 EN 10088	A240	G4303 G4304
2	Hex-head bolt M12 × 30	Stainless steel	A2-70 EN 24014	A320	A2-70
3	O-ring	Chloroprene			
4	Bonnet	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
5	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
6	Seat	High density polymer			

*ICFB 25-40 blank top cover*



Pos.	Part	Material	EN	ASTM	JIS
1	Hex-head bolt M10 × 25	Stainless Steel	A2-70 EN 24017	A320	A2-70
2	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
3	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			

*ICFW 25-40 welding module, 25 DIN*

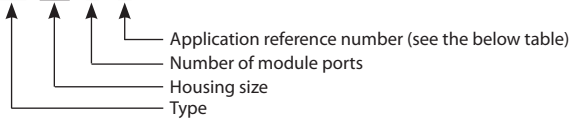


Pos.	Part	Material	EN	ASTM	JIS
1	Hex-head bolt M10 × 25	Stainless Steel	A2-70 EN 24017	A320	A2-70
2	Flange	Cast steel low temperature	G20Mn5QT EN 10213-3	A352	G5152
3	Gasket	Chloroprene (Neoprene)/ Fiber non asbestos			
4	Weld connection	Steel	S235JRG2 EN 10025	A283	G3101

Configuration examples - ICF with six function modules

ICF 20-6

Nomenclature: ICF 20-6-4



Application overview

Application reference number	Application description	TYPE ICF	FUNCTION MODULE LOCATION					
			M1	M2	M3	M4	M5	M6
1	Liquid line, solenoid with manual opening, hand regulation without hot gas defrost	20-6-1	ICFS	ICFF	ICFE	ICFO	ICFR	ICFS
2	Liquid line, solenoid with manual opening, hand regulation with hot gas defrost	20-6-2	ICFS	ICFF	ICFE	ICFO	ICFR	ICFN
3	Liquid line, solenoid without manual opening, hand regulation with hot gas defrost	20-6-3	ICFS	ICFF	ICFE	ICFC	ICFR	ICFS
4	Liquid line, solenoid with manual opening, no hand regulation without hot gas defrost	20-6-4	ICFS	ICFF	ICFE	ICFO	ICFB	ICFS
5A	Liquid line, solenoid with manual opening, electronic stepper motor valve for any defrost	20-6-5A	ICFS	ICFF	ICFE	ICFO	ICM20A	ICFS
5B	Liquid line, solenoid with manual opening, electronic stepper motor valve for any defrost	20-6-5B	ICFS	ICFF	ICFE	ICFO	ICM20B	ICFS
5C	Liquid line, solenoid with manual opening, electronic stepper motor valve for any defrost	20-6-5C	ICFS	ICFF	ICFE	ICFO	ICM20C	ICFS
6	Liquid line, solenoid with manual opening, electronic PWM (Pulse width modulation) valve module for installation without hot gas defrost	20-6-6	ICFS	ICFF	ICFE	ICFO	ICFA	ICFS
7	Liquid line, electronic PWM (Pulse width modulation) valve module for installation with hot gas defrost.	20-6-7	ICFS	ICFF	ICFA	ICFC	ICFB	ICFS

Application 1: ICF 20-6-1

This application is for flooded systems without hot gas defrost.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFO manual opening module
- ICFR manual regulating valve module
- ICFS stop valve module

Application 5: ICF 20-6-5A, B or C

This application can be used for different applications such as direct expansion, liquid injection to compressor or as liquid makeup to keep the level in a separator. A, B or C represents the cone type of the control valve. It combines the solenoid valve in front of the electronic regulating valve and provides additional safety for shutdown.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFO manual opening module
- ICM 20-A/20B/20C motor valve module
- ICFS stop valve module

Application 2: ICF 20-6-2

This application is for flooded systems with hot gas defrost.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFO manual opening module
- ICFR manual regulating valve module
- ICFN stop/check valve module

Application 6: ICF 20-6-6

This application can be used for direct expansion or Liquid injection to compressor. It combines the solenoid valve in front of the electronic regulating valve and provides additional safety for shutdown.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFO manual opening module
- ICFA electronic expansion valve module
- ICFS stop valve module

Application 3: ICF 20-6-3

This application is for flooded systems with hot gas defrost.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFC check valve module
- ICFR manual regulating valve module
- ICFS stop valve module

For this application it is recommended to use the side port P5/P10 to bypass the defrost condensate back to the overflow valve and the suction line.

Application 7: ICF 20-6-7

This application can be used for direct expansion.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFA electronic expansion valve module
- ICFC check valve module
- ICFB blank top cover
- ICFS stop valve module

Application 4: ICF 20-6-4

This application is for a flooded system to feed several evaporator coils with individual hand regulating valve.

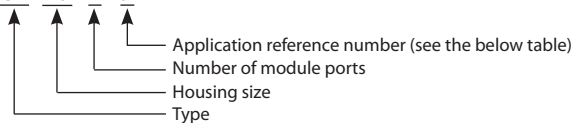
The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFO manual opening module
- ICFB blank top cover
- ICFS stop valve module

Configuration examples - ICF with four function modules

ICF 20-4

Nomenclature: ICF 20-4-9



Application overview

Application reference number	Application description	TYPE ICF	FUNCTION MODULE LOCATION			
			M1	M2	M3	M4
8	Hot gas line, solenoid with manual opening, without stop valve at the outlet	20-4-8	ICFS	ICFF	ICFE	ICFO
9	Hot gas line, solenoid without manual opening, with stop valve at the outlet	20-4-9	ICFS	ICFF	ICFE	ICFS
10	Liquid line, solenoid without manual opening, hand regulation without stop valve at the outlet	20-4-10	ICFS	ICFF	ICFE	ICFR
11	Liquid line, solenoid without manual opening, and check valve for hot gas defrost -without stop valve at the outlet	20-4-11	ICFS	ICFF	ICFE	ICFC
12	Liquid line, electronic PWM valve module for installation without hot gas defrost	20-4-12	ICFS	ICFF	ICFA	ICFS
13	Liquid line, electronic PWM valve module for installation with hot gas defrost	20-4-13	ICFS	ICFF	ICFA	ICFN
14A	Liquid line, electronic stepper motor valve for any defrost	20-4-14A	ICFS	ICFF	ICM20A	ICFS
14B	Liquid line, electronic stepper motor valve for any defrost	20-4-14B	ICFS	ICFF	ICM20B	ICFS
14C	Liquid line, electronic stepper motor valve for any defrost	20-4-14C	ICFS	ICFF	ICM20C	ICFS

Application 8: ICF 20-4-8

This application is for hot gas injection to evaporator (it can also be used in liquid lines where no hand regulating or check valve functions are required).

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFO manual opening module

Application 12: ICF 20-4-12

This application can be used for direct expansion or liquid injection to compressor.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFA electronic expansion valve module
- ICFS stop valve module

Application 9: ICF 20-4-9

This application is for hot gas injection to evaporator (it can also be used in liquid lines where no hand regulating or check valve functions are required).

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFS stop valve module

Application 13: ICF 20-4-13

This application can be used for direct expansion.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFA electronic expansion valve module
- ICFN stop/check valve module

Application 10: ICF 20-4-10

This application is for liquid lines to evaporator where no check valves are required.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFR manual regulating valve module

Application 14: ICF 20-4-14A, B or C.

This application can be used for different applications such as direct expansion, Liquid injection to compressor or as liquid makeup to keep the level in a separator. A, B or C represents the cone type of the control valve.

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICM 20-A/20B/20C motor valve module
- ICFS stop valve module

(same as application 5, but without solenoid valve)

Application 11: ICF 20-4-11

This application is for liquid lines to evaporator for hot gas defrost where no regulating valves are required (where multiple evaporator with individual hand regulating valves are needed).

The modules are:

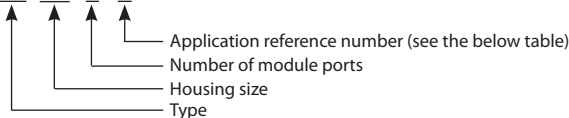
- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFC check valve module



Configuration examples - ICF with six function modules

ICF 25-6 → 40-6

Nomenclature: ICF 25-6-4



Application overview

Application reference number	Application description	TYPE ICF	FUNCTION MODULE LOCATION					
			M1	M2	M3	M4	M5	M6
1A	Liquid line, solenoid with manual opening, hand regulation without hot gas defrost	25-6-1A, 32-6-1A	ICFS	ICFF	ICFE	ICFB	ICFRA	ICFS
1B	Liquid line, solenoid with manual opening, hand regulation without hot gas defrost	25-6-1B, 32-6-1B, 40-6-1B	ICFS	ICFF	ICFE	ICFB	ICFRB	ICFS
3A	Liquid line, solenoid with manual opening, hand regulation with hot gas defrost	25-6-3A, 32-6-3A	ICFS	ICFF	ICFE	ICFC	ICFRA	ICFS
3B	Liquid line, solenoid with manual opening, hand regulation with hot gas defrost	25-6-3B, 32-6-3B, 40-6-3B	ICFS	ICFF	ICFE	ICFC	ICFRB	ICFS
5A	Liquid line, solenoid with manual opening, electronic stepper motor	25-6-5A, 32-6-5A	ICFS	ICFF	ICFE	ICFB	ICM25A	ICFS
5B	Liquid line, solenoid with manual opening, electronic stepper motor	25-6-5B, 32-6-5B, 40-6-5B	ICFS	ICFF	ICFE	ICFB	ICM25B	ICFS
15A	Liquid line, solenoid with manual opening, hand regulation high capacity hot gas defrost	25-6-15A	ICFS	ICFF	ICFE	ICFC	ICFW	ICFRA
15B	Liquid line, solenoid with manual opening, hand regulation high capacity hot gas defrost	32-6-15B, 40-6-15B	ICFS	ICFF	ICFE	ICFC	ICFW	ICFRB

Application 1: ICF (25-40)-6-1A or B

*This application is for flooded systems without hot gas defrost.*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFB blind plug
- ICFR A or B manual regulating valve module
- ICFS stop valve module

Application 5: ICF (25-40)-6-5A or B

*This application can be used for different applications such as direct expansion, liquid injection to compressor or as liquid makeup to keep the level in a separator. A or B represents the cone type of the control valve. It combines the solenoid valve in front of the electronic regulating valve and provides additional safety for shutdown. Please be aware that B cone can not be used for expansion, but only for pressure regulation.*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFB blind plug
- ICM 25-A/B motor valve module
- ICFS stop valve module

Application 3: ICF (25-40)-6-3A or B

*This application is for flooded systems with hot gas defrost.*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFC check valve module
- ICFR A or B manual regulating valve module
- ICFS stop valve module

*For this application it is recommended to use the side port P5/P10 to bypass the defrost condensate back to the overflow valve and the suction line.*

Application 15: ICF 20-6-15A or B

*This application is for flooded systems with hot gas defrost (similar to application 3, but for higher capacities).*

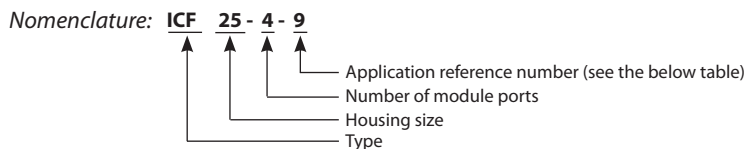
The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFC check valve module
- ICFW external connection welding module
- ICFR A or B manual regulating valve module

*For this application ICFW module is used to bypass the defrost condensate back to the overflow valve and the suction line.*

Configuration examples - ICF with four function modules

ICF 25-4 → 40-4



Application overview

Application reference number	Application description	TYPE ICF	FUNCTION MODULE LOCATION			
			M1	M2	M3	M4
8	Hot gas line, solenoid with manual opening, without stop valve at the outlet	25-4-8, 32-4-8, 40-4-8	ICFS	ICFF	ICFE	ICFB
9	Hot gas line, solenoid with manual opening, with stop valve at the outlet	25-4-9, 32-4-9, 40-4-9	ICFS	ICFF	ICFE	ICFS
10A	Liquid line, solenoid with manual opening, hand regulation without stop valve at the outlet	25-4-10, 32-4-10	ICFS	ICFF	ICFE	ICFRA
10B	Liquid line, solenoid with manual opening, hand regulation without stop valve at the outlet	32-4-10, 40-4-10	ICFS	ICFF	ICFE	ICFRB
11	Liquid line, solenoid with manual opening, and check valve for hot gas defrost - without stop valve at the outlet	32-4-11, 40-4-11	ICFS	ICFF	ICFE	ICFC
14A	Liquid line, electronic stepper motor valve for any defrost	25-4-14A, 32-4-14A	ICFS	ICFF	ICM25A	ICFS
14B	Liquid line, electronic stepper motor valve for any defrost	32-4-14B, 40-4-14B	ICFS	ICFF	ICM25B	ICFS

Application 8: ICF (25-40)-4-8

*This application is for hot gas injection to evaporator (it can also be used in liquid lines where no hand regulating or check valve functions are required).*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFB blind plug

Application 11: ICF (25-40)-4-11

*This application is for liquid lines to evaporator for hot gas defrost where no regulating valves are required (where multiple evaporator with individual hand regulating valves are feeded).*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFC check valve module

Application 9: ICF (25-40)-4-9

*This application is for hot gas injection to evaporator (it can also be used in liquid lines where no hand regulating or check valve functions are required).*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFS stop valve module

Application 14: ICF (25-40)-4-14A or B.

*This application can be used for different applications such as direct expansion, Liquid injection to compressor or as liquid makeup to keep the level in a separator. A, or B represents the cone type of the control valve. Please be aware that B cone can not be used for expansion, but only for pressure regulation.*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICM 25 A or B motor valve module
- ICFS stop valve module (same as application 5, but without solenoid valve)

Application 10: ICF (25-40)-4-10A or B

*This application is for liquid lines to evaporator where no check valves are required.*

The modules are:

- ICFS stop valve module
- ICFF filter module
- ICFE solenoid valve module
- ICFR A or B manual regulating valve module

**Code number selection**

To determine the correct ICF solution follow steps 1 through 5.

**Step 1 Determine application and function requirements:**

- Line: Liquid DX, flooded or hot gas
- Control: On/off solenoid valve, motorised valve
- Defrost: Electric or hot gas

From the above determine the application reference number (see pages 14, 15, 16 and 17):

**Step 2 Selection criteria**

- Refrigerant
- Capacity
- Temperature
- Circulation rate

From the above determine the solution required, e.g.: ICF 20 complete with ICM 20-C

**Step 3 Establish connection sizes and type**

- DIN butt-weld, ANSI butt-weld or SOC weld
- 20 (¾ in.), 25 (1 in.), 32 (1 ¼ in.) or 40 (1 ½ in.)

**Step 4 Establish number of side ports:**

- ICF 20-4, 25-4, 32-4, 40-4: 0, 2 or 4 side ports
- ICF 20-6, 25-6, 32-6, 40-6: 0, 4 or 6 side ports

**Step 5 Establish code number**

(See pages 22, 23, 24 and 25)

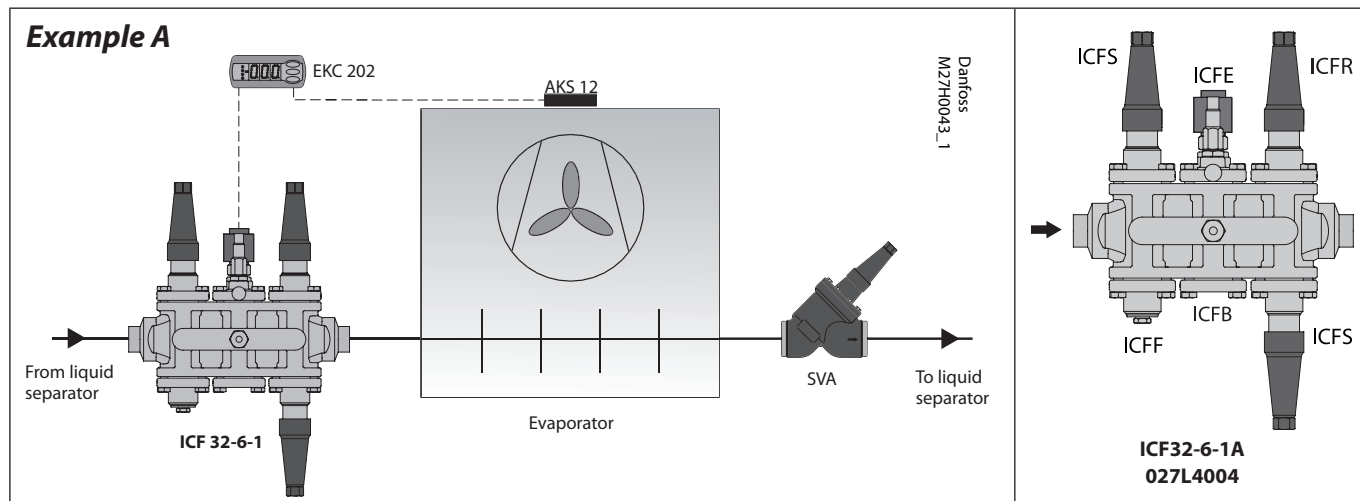
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**Application example A**

A valve combination for a flooded evaporator operating on/off from a thermostat and with electric defrost is required. Manual override of the solenoid valve is requested. Pipe dimension is 25 mm, and there is a demand for butt weld DIN connections.

There are no requirements for any sight glass or side connections for drain or pressure gauges.

For this application **ICF 32-6-1A**, code number **027L4004** is recommended.



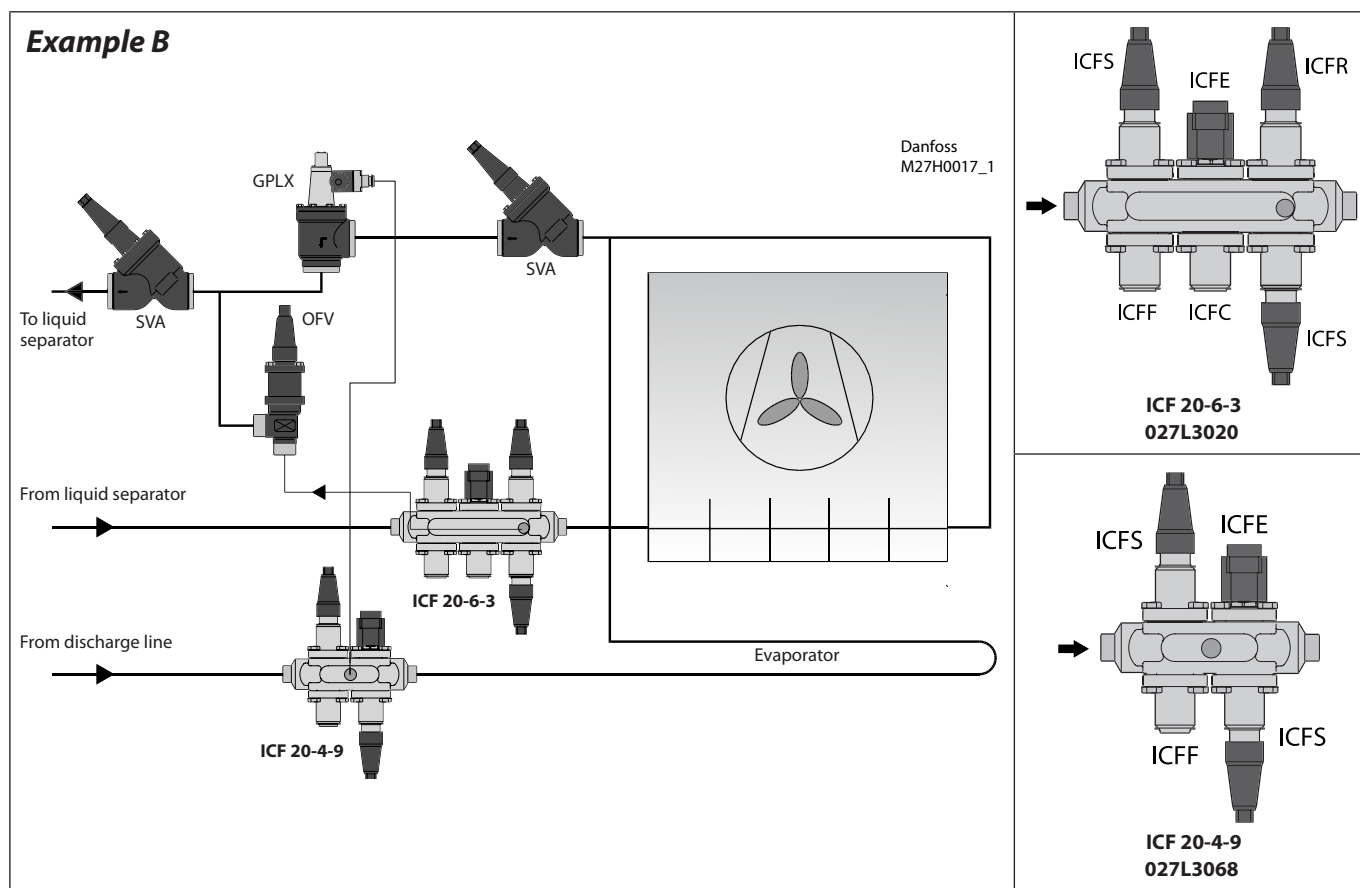
**Application example B**

A valve combination for a flooded evaporator operating on/off from a thermostat and with hot gas defrost is required. Pipe dimension is 25 mm, and there is a demand for butt weld DIN connections. It is a request to have 4 sideports for external connectors.

On the same evaporator a hot gas valve to inject the gas into is needed. Pipe dimension is 32 mm, and there is a demand for butt weld DIN connections. It is a request to have 2 sideports for external connectors.

For this application **ICF 20-6-3**, code number **027L3020** is recommended.

For this application **ICF 20-4-9**, code number **027L3068** is recommended.

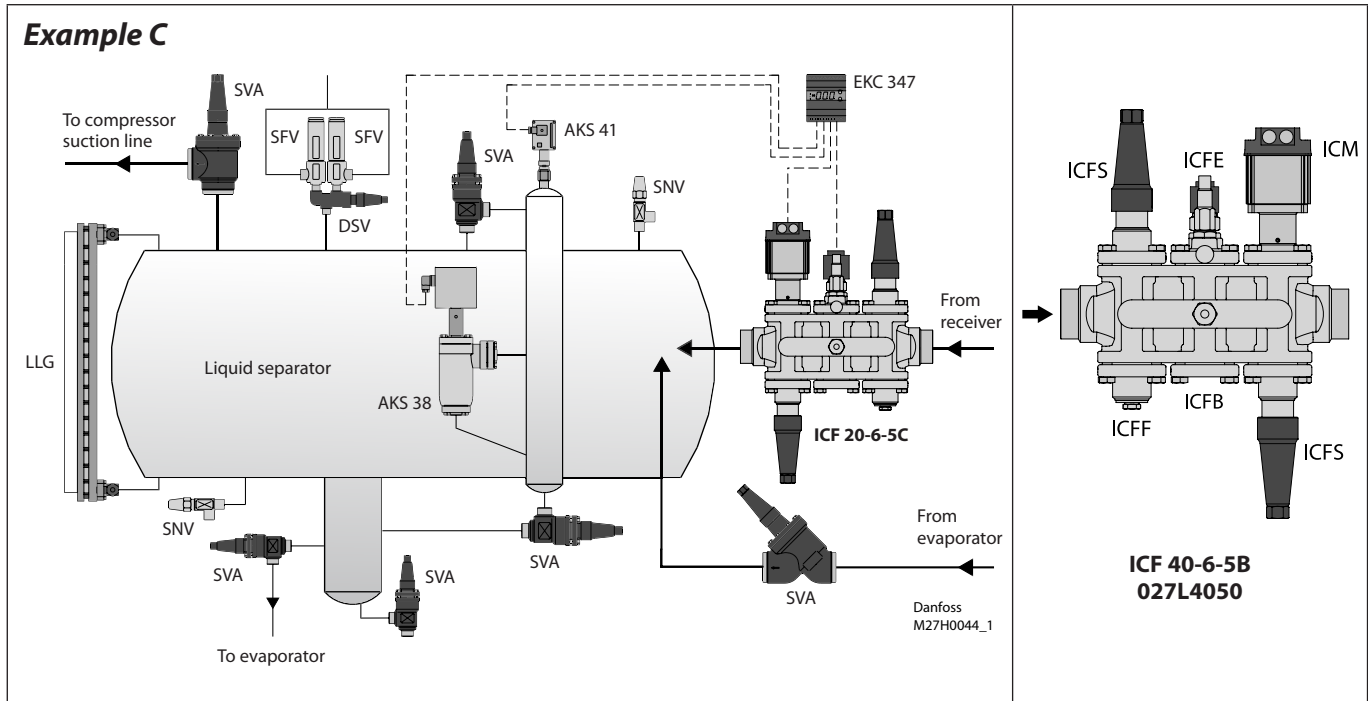


**Application example C**

A valve combination for liquid injection to separator with electronic injection valve is required. It is requested to have a solenoid valve in front of the control valve. Pipe dimension is 32 mm, and there is a demand for socket weld connections.

There are requirements for sight glass or side connections for drain or pressure gauges.

For this application **ICF 40-6-5B**, code number **027L4050** is recommended.

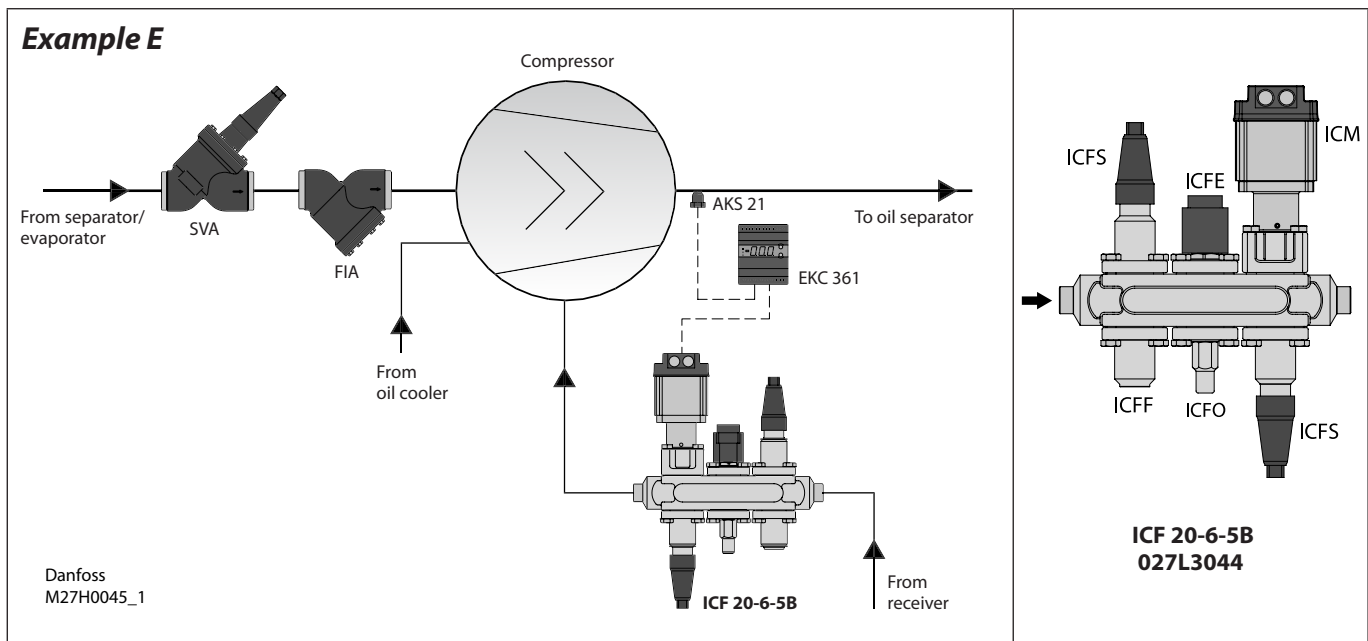


**Application example E**

A valve combination for compressor liquid injection with electronic injection valve is required. It is a required to have a solenoid valve in front of the control valve. Pipe dimension is 25 mm, and there is a demand for socket weld connections.

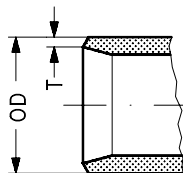
There are no requirements for sight glass or side connections for drain or pressure gauges.

For this application **ICF 20-6-5B**, code number **027L3044** is recommended.



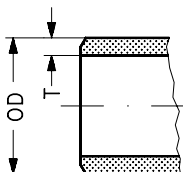
**Connections**

D: Butt-weld DIN (EN 10220)



Size mm	Size in.	OD mm	T mm	OD in.	T in.		
20	( <sup>3</sup> / <sub>4</sub> )	26.9	2.3	1.059	0.091		
25	(1)	33.7	2.6	1.327	0.103		
32	(1 <sup>1</sup> / <sub>4</sub> )	42.4	2.6	1.669	0.102		
40	(1 <sup>1</sup> / <sub>2</sub> )	98.3	2.6	1.902	0.103		

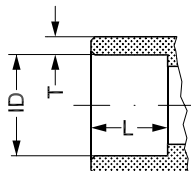
A: Butt-weld ANSI (B 36.10)



Size mm	Size in.	OD mm	T mm	OD in.	T in.	Schedule	
(20)	<sup>3</sup> / <sub>4</sub>	26.9	4.0	1.059	0.158	80	
(25)	1	33.7	4.6	1.327	0.181	80	
(32)	1 <sup>1</sup> / <sub>4</sub>	42.4	4.9	1.669	0.193	80	
(40)	1 <sup>1</sup> / <sub>2</sub>	98.3	5.1	1.902	0.201	80	

SOC:

Socket welding ANSI (B 16.11)



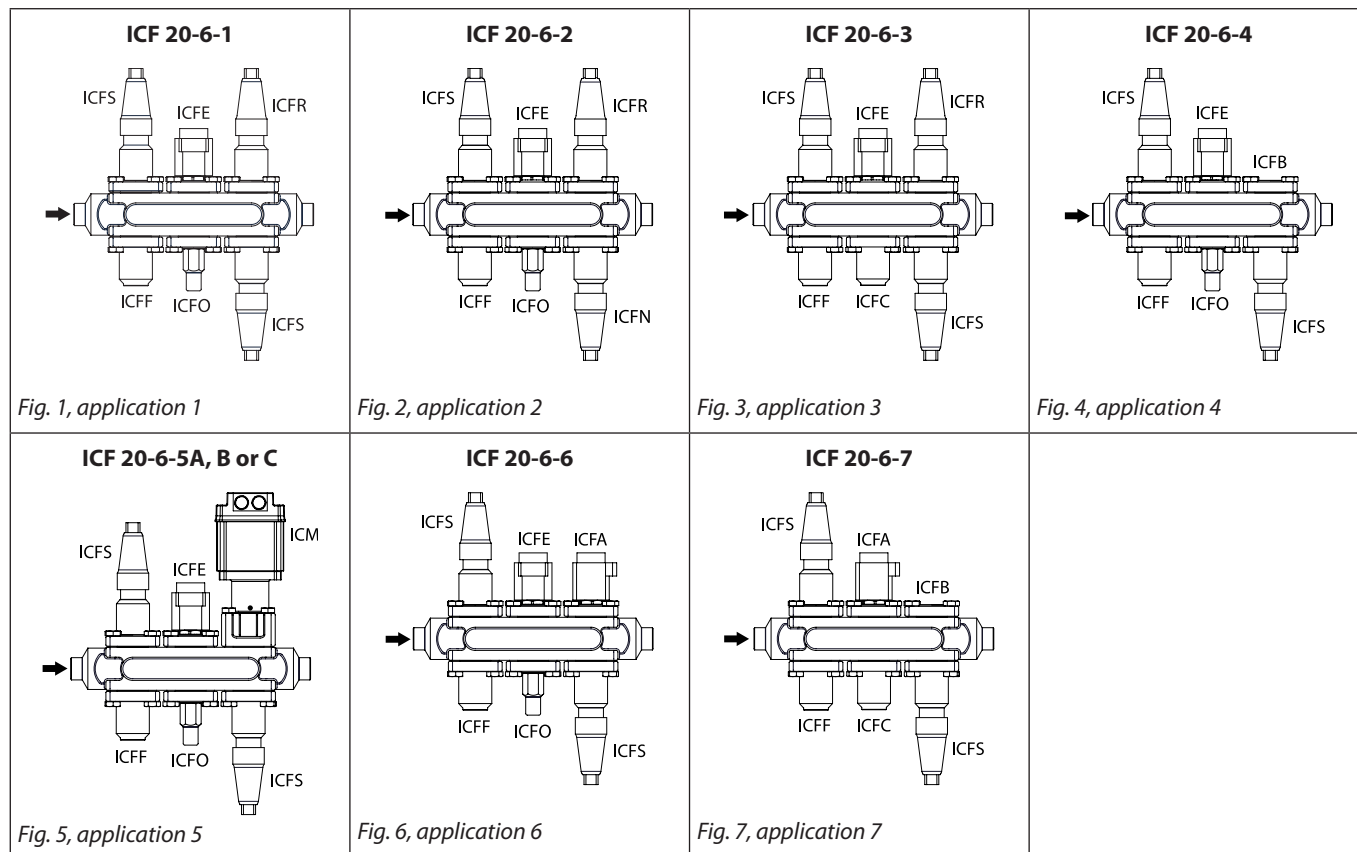
Size mm	Size in.	ID mm	T mm	ID in.	T in.	L mm	L in.
(20)	<sup>3</sup> / <sub>4</sub>	27.2	4.6	1.071	0.181	13	0.51
(25)	1	33.9	7.2	1.335	0.284	13	0.51
(32)	1 <sup>1</sup> / <sub>4</sub>	42.7	6.1	1.743	0.240	13	0.51
(40)	1 <sup>1</sup> / <sub>2</sub>	98.8	6.6	1.921	0.260	13	0.51

Ordering ICF 20 with six function modules

ICF 20-6

Nomenclature: **ICF 20-6-4**

↑ Application reference number (see the below table)  
 ↑ Number of module ports  
 ↑ Housing size  
 ↑ Type



**Code numbers**  
The code numbers refer to one complete assembled control solution.

Connection	Number of Side port connections*	Application reference number (see pages 14 - 17)								
		1	2	3	4	5	5	5	6	7
		ICF 20-6-1 Fig. 1	ICF 20-6-2 Fig. 2	ICF 20-6-3 Fig. 3	ICF 20-6-4 Fig. 4	ICF 20-6-5A Fig. 5	ICF 20-6-5B Fig. 5	ICF 20-6-5C Fig. 5	ICF 20-6-6 Fig. 6	ICF 20-6-7 Fig. 7
20 D (3/4 in.)	4	027L3000	027L3009	027L3018		027L3034			027L3053	027L3056
25 D (1 in.)	None	027L3001	027L3010	027L3019	027L3027	027L3035	027L3041	027L3046		
	4	027L3002	027L3011	027L3020	027L3028	027L3036	027L3042	027L3047		
32 D (1 1/4 in.)	4	027L3003	027L3012	027L3021	027L3029			027L3048		
20 A (3/4 in.)	4	027L3004	027L3013	027L3022	027L3030	027L3037	027L3043	027L3049	027L3054	027L3057
20 SOC (3/4 in.)	6	027L3005	027L3014	027L3023	027L3124	027L3038			027L3055	027L3058
	None	027L3125	027L3126			027L3127				
25 SOC (1 in.)	None	027L3006	027L3015	027L3024	027L3031	027L3039	027L3044	027L3050		
	6	027L3007	027L3016	027L3025	027L3032	027L3040	027L3045	027L3051		
32 SOC (1 1/4 in.)	6	027L3008	027L3017	027L3026	027L3033			027L3052		
	None	027L3128	027L3129							

ICAD and coils are not included and must be ordered separately. Please refer to the section "Ordering accessories".

D = Butt-weld DIN (2448)  
 A = Butt-weld ANSI (B 36.10)  
 SOC = Socket welding ANSI (B 16.11)

Not available

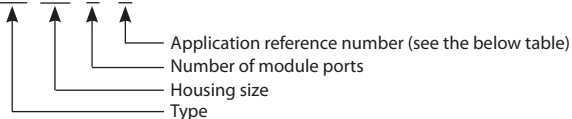
\* Four side ports include four blind plugs and one 1/2 in. connector. Side ports in P2/P7 and P5/P10.  
 Six side ports include six blind plugs. Side ports in P2/P7, P4/P9 and P5/P10.  
 Side ports are 3/8" G for butt weld connection or 3/8" NPT for socket weld connection.



Ordering ICF 20 with four function modules

ICF 20-4

Nomenclature: **ICF 20-4-9**



<p><b>ICF 20-4-8</b></p> <p><i>Fig. 8, application 8</i></p>	<p><b>ICF 20-4-9</b></p> <p><i>Fig. 9, application 9</i></p>	<p><b>ICF 20-4-10</b></p> <p><i>Fig. 10, application 10</i></p>	<p><b>ICF 20-4-11</b></p> <p><i>Fig. 11, application 11</i></p>
<p><b>ICF 20-4-12</b></p> <p><i>Fig. 12, application 12</i></p>	<p><b>ICF 20-4-13</b></p> <p><i>Fig. 13, application 13</i></p>	<p><b>ICF 20-4-14A, B or C</b></p> <p><i>Fig. 14, application 14</i></p>	

Code numbers

The code numbers refer to one complete assembled control solution.

Connection	Number of Side port connections*	Application reference number (see pages 14 - 17)								
		8	9	10	11	12	13	14	14	14
		ICF 20-4-8 <i>Fig. 8</i>	ICF 20-4-9 <i>Fig. 9</i>	ICF 20-4-10 <i>Fig. 10</i>	ICF 20-4-11 <i>Fig. 11</i>	ICF 20-4-12 <i>Fig. 12</i>	ICF 20-4-13 <i>Fig. 13</i>	ICF 20-4-14A <i>Fig. 14</i>	ICF 20-4-14B <i>Fig. 14</i>	ICF 20-4-14C <i>Fig. 14</i>
20 D (3/4 in.)	2			027L3073		027L3089	027L3092	027L3095		
25 D (1 in.)	None	027L3059	027L3066	027L3074	027L3082			027L3096	027L3102	027L3107
	2	027L3060	027L3067	027L3075	027L3083			027L3097	027L3103	027L3108
32 D (1 1/4 in.)	2	027L3061	027L3068	027L3076	027L3084					027L3109
20 A (3/4 in.)	2	027L3062	027L3069	027L3077	027L3085	027L3090	027L3093	027L3098	027L3104	027L3110
20 SOC (3/4 in.)	4			027L3078		027L3091	027L3094	027L3099		
25 SOC (1 in.)	None	027L3063	027L3070	027L3079	027L3086			027L3100	027L3105	027L3111
	4	027L3064	027L3071	027L3080	027L3087			027L3101	027L3106	027L3112
32 SOC (1 1/4 in.)	4	027L3065	027L3072	027L3081	027L3088					027L3113

ICAD and coils are not included and must be ordered separately. Please refer to the section "Ordering accessories".

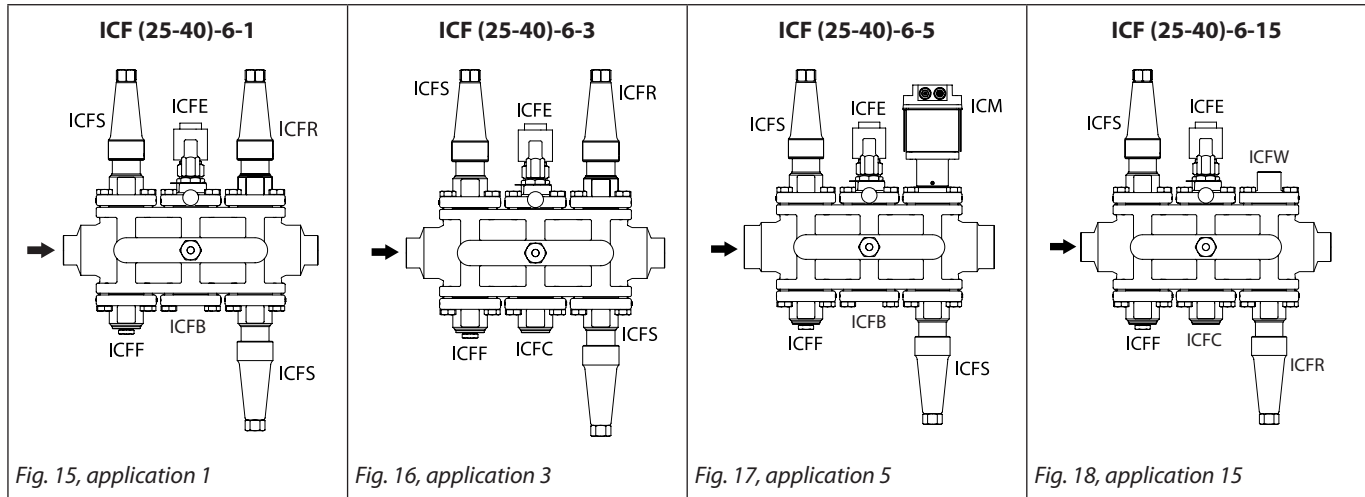
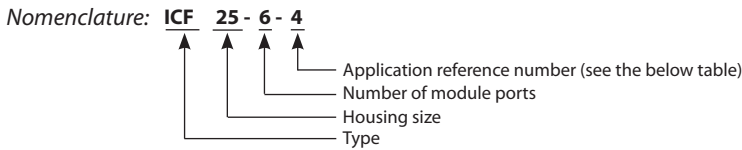
- D = Butt-weld DIN (2448)
- A = Butt-weld ANSI (B 36.10)
- SOC = Socket welding ANSI (B 16.11)

Not available

\* Two side ports include two blind plugs and one 1/2 in. connector. Side ports in P2/P5. Four side ports include four blind plugs. Side ports in P2/P5 and P3/P6. Side ports are 3/8" G for butt weld connection or 3/8" NPT for socket weld connection.

Ordering ICF 25-40 with six function modules

ICF 25-6 → ICF 40-6



Code numbers

The code numbers refer to one complete assembled control solution.

Connection	Number of Side port connections*	Application reference number (see pages 14 - 17)							
		1A	1B	3A	3B	5A	5B	15A	15B
		ICF 25-6-1A ICF 32-6-1A Fig. 15	ICF 32-6-1B ICF 40-6-1B Fig. 15	ICF 25-6-3A ICF 32-6-3A Fig. 16	ICF 32-6-3B ICF 40-6-3B Fig. 16	ICF 25-6-5A ICF 32-6-5A Fig. 17	ICF 32-6-5B ICF 40-6-5B Fig. 17	ICF 25-6-15A Fig. 18	ICF 32-6-15B ICF 40-6-15B Fig. 18
25 D (1 in.)	None	027L4000		027L4018		027L4036		027L4119	
32 D (1 1/4 in.)	None	027L4004	027L4009	027L4022	027L4027	027L4040	027L4045		027L4123
40 D (1 1/2 in.)	None		027L4014		027L4032		027L4050		027L4128
25 D (1 in.)	4	027L4002		027L4020		027L4038		027L4121	
32 D (1 1/4 in.)	4	027L4006	027L4011	027L4024	027L4029	027L4042	027L4047		027L4126
40 D (1 1/2 in.)	4		027L4016		027L4034		027L4052		027L4130
25 SOC (1 in.)	None	027L4001		027L4019		027L4037		027L4120	
32 SOC (1 1/4 in.)	None	027L4005	027L4010	027L4023	027L4028	027L4041	027L4046		027L4124
40 SOC (1 1/2 in.)	None		027L4015		027L4033		027L4051		027L4129
25 SOC (1 in.)	6	027L4003		027L4021		027L4039		027L4122	
32 SOC (1 1/4 in.)	6	027L4008	027L4013	027L4026	027L4031	027L4044	027L4049		027L4127
40 SOC (1 1/2 in.)	6		027L4017		027L4035		027L4053		027L4131
32 A (1 1/4 in.)	4	027L4007	027L4012	027L4025	027L4030	027L4043	027L4048		027L4125

ICAD and coils are not included and must be ordered separately. Please refer to the section "Ordering accessories".

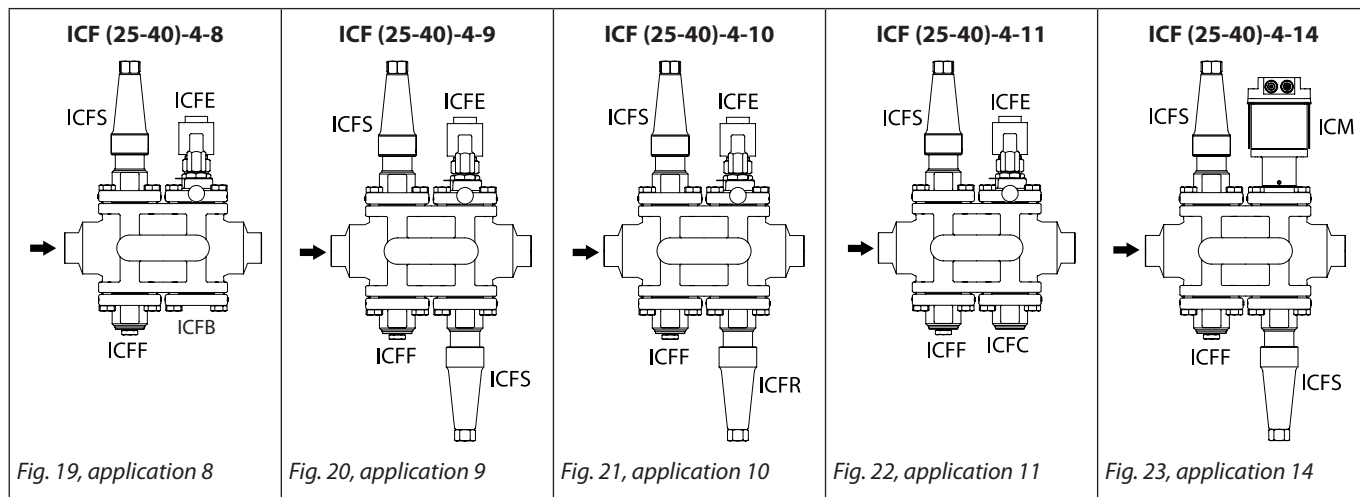
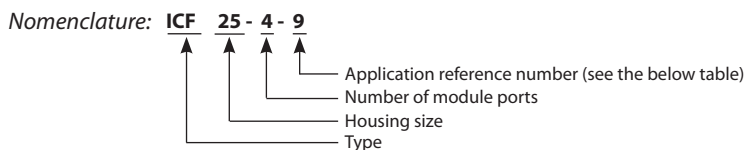
- D = Butt-weld DIN (2448)
- A = Butt-weld ANSI (B 36.10)
- SOC = Socket welding ANSI (B 16.11)

Not available

\* Four side ports include four blind plugs and one 1/2 in. connector. Side ports in P2/P7 and P5/P10. Six side ports include six blind plugs. Side ports in P2/P7, P4/P9 and P5/P10. Side ports are 3/8" G for butt weld connection or 3/8" NPT for socket weld connection.

Ordering ICF 25-40 with four function modules

ICF 25-4 → ICF 40-4



Code numbers

The code numbers refer to one complete assembled control solution.

Connection	Number of Side port connections*	Application reference number (see page 14 - 17)						
		8	9	10A	10B	11	14A	14B
		ICF 25-4-8 ICF 32-4-8 ICF 40-4-8 <i>Fig. 19</i>	ICF 25-4-9 ICF 32-4-9 ICF 40-4-9 <i>Fig. 20</i>	ICF 25-4-10A ICF 32-4-10A ICF 40-4-10A <i>Fig. 21</i>	ICF 25-4-10B ICF 32-4-10B ICF 40-4-10B <i>Fig. 21</i>	ICF 25-4-11 ICF 32-4-11 ICF 40-4-11 <i>Fig. 22</i>	ICF 25-4-14A ICF 32-4-14A ICF 40-4-14A <i>Fig. 23</i>	ICF 25-4-14B ICF 32-4-14B ICF 40-4-14B <i>Fig. 23</i>
25 D (1 in.)	None	027L4054	027L4061	027L4074			027L4101	
32 D (1 1/4 in.)	None	027L4056	027L4065	027L4078	027L4083	027L4092	027L4105	027L4110
40 D (1 1/2 in.)	None	027L4059	027L4070		027L4088	027L4097		027L4115
25 D (1 in.)	2		027L4063	027L4076			027L4103	
32 D (1 1/4 in.)	2		027L4067	027L4080	027L4085	027L4094	027L4107	027L4112
40 D (1 1/2 in.)	2		027L4072		027L4090	027L4099		027L4117
25 SOC (1 in.)	None	027L4055	027L4062	027L4075			027L4102	
32 SOC (1 1/4 in.)	None	027L4057	027L4066	027L4079	027L4084	027L4093	027L4106	027L4111
40 SOC (1 1/2 in.)	None	027L4060	027L4071		027L4089	027L4098		027L4116
25 SOC (1 in.)	4		027L4064	027L4077			027L4104	
32 SOC (1 1/4 in.)	4		027L4069	027L4082	027L4087	027L4096	027L4109	027L4114
40 SOC (1 1/2 in.)	4		027L4073		027L4091	027L4100		027L4118
32 A (1 1/4 in.)	None	027L4058						
32 A (1 1/4 in.)	2		027L4068	027L4081	027L4086	027L4095	027L4108	027L4113

ICAD and coils are not included and must be ordered separately. Please refer to the section "Ordering accessories".

- D = Butt-weld DIN (2448)
- A = Butt-weld ANSI (B 36.10)
- SOC = Socket welding ANSI (B 16.11)

Not available

\* Two side ports include two blind plugs and one 1/2 in. connector. Side ports in P2/P5.  
 Four side ports include four blind plugs. Side ports in P2/P5 and P3/P6.  
 Side ports are 3/8" G for butt weld connection or 3/8" NPT for socket weld connection.

Ordering accessories

Stop valve type SNV-ST

	Quantity	Code no.
	1	148B3778

Sight glass

	Quantity	Code no.
	2 pcs. 3/8" RG	027L1267

Blind plug

	Quantity	Code no.
	2 pcs. 3/8" RG 2 pcs. 3/8" NPT	027L1265 027L1268

ICAD 600

	Quantity	Code no.
	1	027H1200

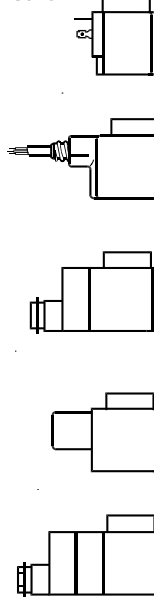
Connector

	Quantity	Code no.
	2	027L1266

3/8 in. weld connector

	Quantity	Code no.
	2	148B4184

Coils



Valve type	Voltage V	Frequency Hz	Code no.			Appendix no.*)	Power consumption
			With 1 m 3-core cable IP 67	With terminal box IP 67	With DIN plugs**)		

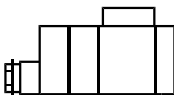
Alternating current a.c.

ICFE	Voltage	Frequency	Code no.	Code no.	Code no.	Appendix no. *)	Power consumption
	12	50	018F6256	018F6706		15	Holding: 10 W 21 VA
	24	50	018F6257	018F6707	018F7358	16	
	220-230	50	018F6251	018F6701	018F7351	31	Inrush: 44 VA
	115	60	018F6260	018F6710		20	

Direct current d.c.

ICFE/ICFA	Voltage	Frequency	Code no.	Code no.	Appendix no. *)	Coil type I	Power consumption
	12			018F6856	01	20 W	
	24			018F6857	02		

Special coils for ICFE



Valve type	Voltage V	Frequency Hz	Code no.	Appendix no. Indicates voltage and frequency	Power consumption
			With terminal box IP 67		

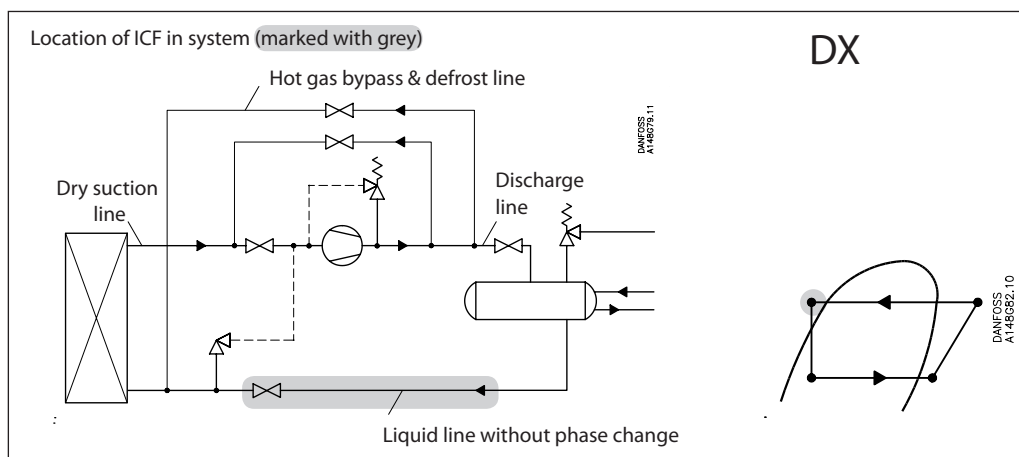
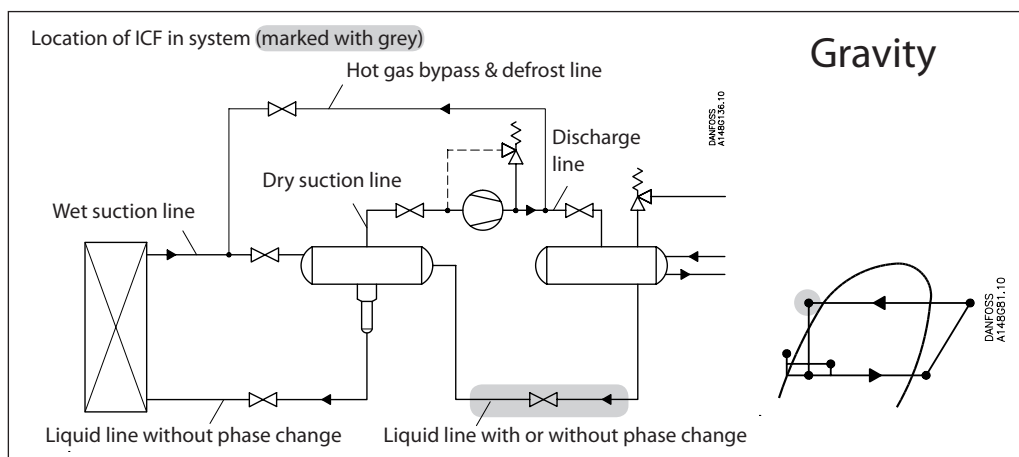
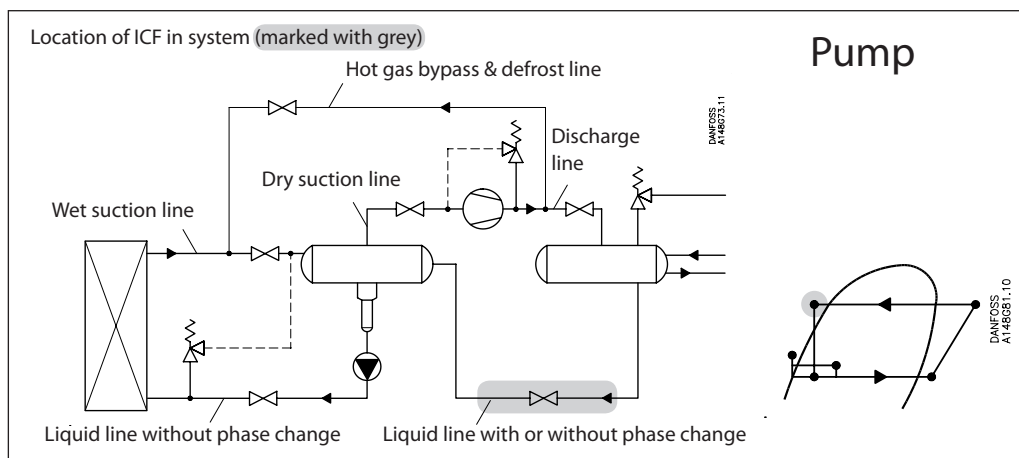
Alternating current a.c.

ICFE	Voltage	Frequency	Code no.	Code no.	Appendix no. *)	Power consumption
	24	50	018F6807		16	Holding: 12 W 26 VA
	110	50	018F6811		22	
	220-230	50	018F6801		31	Inrush: 55 VA

For other coil types please refer to the technical leaflets for EVRA or AKVA valves.

Nominal capacities

ICF high pressure liquid line without phase change



**Nominal capacities**

In this example the ICF will be used in a liquid line, only as a solenoid valve (with the fitted additional components such as stop valves, filter and others depending on the selected application).

**ICF high pressure liquid line without phase change**

The application reference numbers are 4, 8, 9 or 11 (see pages 14 - 17)

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:

$$\begin{aligned} T_e &= -20 \text{ C} \\ Q_o &= 250 \text{ kW} \\ T_{liq} &= 10 \text{ }^\circ\text{C} \\ \text{Max. } \Delta p &= 0.3 \text{ bar} \end{aligned}$$

The capacity table is based on nominal condition (pressure drop  $\Delta p = 0.2 \text{ bar}$ ,  $T_{liq} = 30^\circ\text{C}$ )

Therefore the actual capacity must be corrected to nominal condition by means of correction factors.

$$\begin{aligned} \text{Correction factor for } \Delta p \text{ 0.3 bar } f_{\Delta p} &= 0.82 \\ \text{Correction factor for liquid temperature } f_{T_{liq}} &= 0.92 \end{aligned}$$

$$Q_n = Q_o \times f_{\Delta p} \times f_{T_{liq}} = 250 \times 0.82 \times 0.92 = 189 \text{ kW}$$

The capacity table gives a capacity of 280 kW, which is suitable for the installation.

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2 \text{ bar}$

**R 717**
**Liquid line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	268	272	276	280	283	285	288	289
ICF 25-40	8, 9, 11	10.8	1073	1089	1106	1120	1132	1141	1150	1156

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Correction factor for liquid temperature ( $T_{liq}$ )

Liquid temperature	Correction factor
-20 $^\circ\text{C}$	0.82
-10 $^\circ\text{C}$	0.86
0 $^\circ\text{C}$	0.88
10 $^\circ\text{C}$	0.92
20 $^\circ\text{C}$	0.96
<b>30<math>^\circ\text{C}</math></b>	<b>1.00</b>
40 $^\circ\text{C}$	1.04
50 $^\circ\text{C}$	1.09

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 10^\circ\text{C}$ ,  
 $\Delta P = 0.2 \text{ bar}$

**R 744**
**Liquid line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	65.2	65.7	66.3	66.3	65.7	64.6	62.2	98
ICF 25-40	8, 9, 11	10.8	261	263	265	265	263	258	249	392

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Correction factor for liquid temperature ( $T_{liq}$ )

Liquid temperature	Correction factor
-20 $^\circ\text{C}$	0.52
-10 $^\circ\text{C}$	0.67
0 $^\circ\text{C}$	0.91
<b>10<math>^\circ\text{C}</math></b>	<b>1.00</b>
15 $^\circ\text{C}$	1.09


**Note**

$K_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

**Nominal capacities**

 Capacity table for nominal conditions,  $Q_N$  [kW],

 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2 \text{ bar}$ 
**R 134a** ICF high pressure liquid line without phase change

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]						
			-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	48	50	53	55	57	59	61
ICF 25-40	8, 9, 11	10.8	192	201	210	219	228	237	244

 Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

 Correction factor for liquid temperature ( $T_{liq}$ )

Liquid temperature	Correction factor
-20 $^\circ\text{C}$	0.66
-10 $^\circ\text{C}$	0.70
0 $^\circ\text{C}$	0.76
10 $^\circ\text{C}$	0.82
20 $^\circ\text{C}$	0.90
<b>30<math>^\circ\text{C}</math></b>	<b>1.00</b>
40 $^\circ\text{C}$	1.13
50 $^\circ\text{C}$	1.29

**Nominal capacities**

 Capacity table for nominal conditions,  $Q_N$  [kW],

 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2 \text{ bar}$ 
**R 404A** ICF high pressure liquid line without phase change

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	31.1	33.3	35.5	37.6	39.6	41.6	43.3	44.9
ICF 25-40	8, 9, 11	10.8	124	133	142	150	158	166	173	180

 Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

 Correction factor for liquid temperature ( $T_{liq}$ )

Liquid temperature	Correction factor
-20 $^\circ\text{C}$	0.55
-10 $^\circ\text{C}$	0.60
0 $^\circ\text{C}$	0.66
10 $^\circ\text{C}$	0.74
20 $^\circ\text{C}$	0.85
<b>30<math>^\circ\text{C}</math></b>	<b>1.00</b>
40 $^\circ\text{C}$	1.23
50 $^\circ\text{C}$	1.68

**Nominal capacities**

 Capacity table for nominal conditions,  $Q_N$  [kW],

 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2 \text{ bar}$ 
**R 22** ICF high pressure liquid line without phase change

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	53.6	55.2	56.9	58.7	59.9	61.6	62.8	64.0
ICF 25-40	8, 9, 11	10.8	214	221	228	235	239	247	251	256

 Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

 Correction factor for liquid temperature ( $T_{liq}$ )

Liquid temperature	Correction factor
-20 $^\circ\text{C}$	0.71
-10 $^\circ\text{C}$	0.75
0 $^\circ\text{C}$	0.80
10 $^\circ\text{C}$	0.86
20 $^\circ\text{C}$	0.92
30 $^\circ\text{C}$	<b>1.00</b>
40 $^\circ\text{C}$	1.09
50 $^\circ\text{C}$	1.22


**Note**

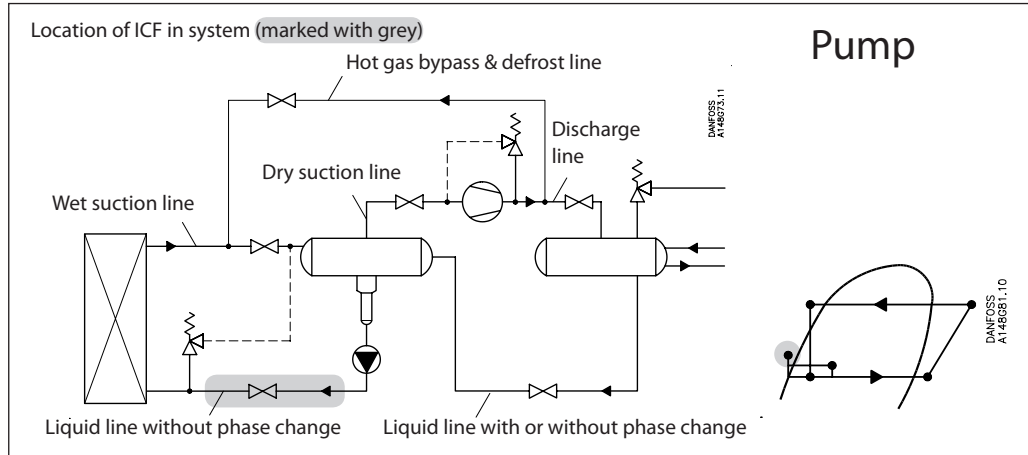
$K_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.



Nominal capacities

ICF pumped liquid line without phase change

This example includes all applications except 6,7,12 and 13 (ICF with a pulse width modulating valve type ICFA)



SI units

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:

- $T_e = -20\text{ C}$
- $Q_o = 100\text{ kW}$
- Circulation rate = 3 ~  $f_{rec} = 0.75$
- Wanted pressure drop = 0.6  $f_{\Delta p} = 0.91$

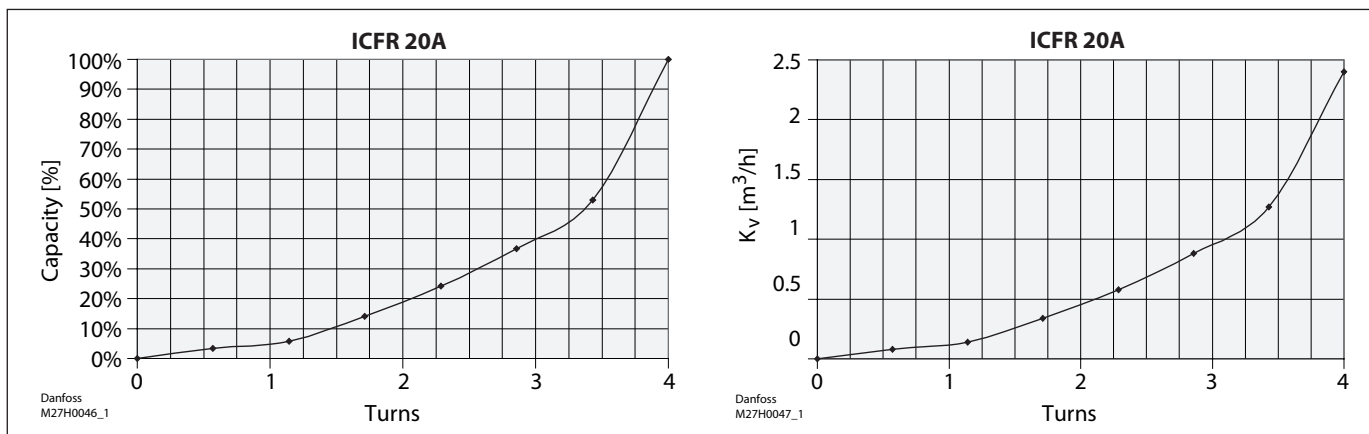
$$Q_n = Q_o \times f_{\Delta p} \times f_{rec} = 100 \times 0.75 \times 0.91 = 68.25\text{ kW}$$

Find the capacity (126 kW) from the capacity table.

The valve capacity is higher than the evaporator capacity, thus the ICF can be used for applications with ICM 20B and ICFR 20A (applications 1,2,3, 5B, 10 and 14B). If the capacity is below the evaporator capacity, the ICF cannot be used.

Setting of the ICFR 20A hand regulating valve (application 1, 2, 3 and 10):  
Actual capacity is calculated to  $68.25/126 = 54\%$ .

The below chart indicates the setting of the hand regulating valve to be  $3\frac{1}{2}$  turns.



**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
Circulation rate = 4,  
 $\Delta P = 0.5$  bar

**R 717**
**ICF pumped liquid line without phase change**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $m^3/h$ )	Evaporating temperature [°C]							
			-50	-40	-30	-20	-10	0	10	20
ICF20 (With ICM 20-A)	5A, 14A	0.60	34.6	33.7	32.7	31.6	30.5	29.3	28.1	26.8
ICF20 (With ICM 20-B, ICFE or ICFR 20A)	1-4, 5B, 5C, 8-11, 14B	2.40	139	135	131	127	122	117	112	107
ICF20 (With ICM 20-C)	14C	4.60	266	258	251	242	234	225	215	205
ICF25-40 (with REG 25-40 A and ICM 25A)	1A, 3A, 5A, 10A, 14A	6.00	346	337	327	316	305	293	281	268
ICF25-40 (with REG 25-40 B and ICM 25 B)	1B, 3B, 5B, 14B	12.00	693	674	654	632	610	586	562	536
ICF25-40 (with ICFE 25-40, no reg. valve)	8, 9, 11	20.00	1154	1123	1090	1054	1017	977	936	893

**Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )**

$\Delta P$ (bar)	Correction factor
0.1	2.24
0.2	1.58
0.3	1.29
0.4	1.12
<b>0.5</b>	<b>1.00</b>
0.6	0.91
1.0	0.71
1.5	0.58
2.0	0.50

**Correction factor for circulation rate ( $f_{rec}$ )**

Circulation rate	Correction factor
2	0.5
3	0.75
<b>4</b>	<b>1</b>
6	1.5
8	2
10	2.5

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
Circulation rate = 4,  
 $\Delta P = 0.5$  bar

**R 744**
**ICF pumped liquid line without phase change**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $m^3/h$ )	Evaporating temperature [°C]							
			-50	-40	-30	-20	-10	0	10	20
ICF20 (With ICM 20-A)	5A, 14A	0.60	10.7	10	9.3	8.5	7.6	6.6	5.4	
ICF20 (With ICM 20-B, ICFE or ICFR 20A)	1-4, 5B, 5C, 8-11, 14B	2.40	42.7	40	37.1	33.9	30.4	26.4	21.7	
ICF20 (With ICM 20-C)	14C	4.60	82	77	71	65	58	51	42	
ICF25-40 (with REG 25-40 A and ICM 25A)	1A, 3A, 5A, 10A, 14A	6.00	107	100	93	85	76	66	54	
ICF25-40 (with REG 25-40 B and ICM 25 B)	1B, 3B, 5B, 14B	12.00	213	200	186	170	152	132	109	
ICF25-40 (with ICFE 25-40, no reg. valve)	8, 9, 11	20.00	356	333	310	283	253	220	181	

**Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )**

$\Delta P$ (bar)	Correction factor
0.1	2.24
0.2	1.58
0.3	1.29
0.4	1.12
<b>0.5</b>	<b>1.00</b>
0.6	0.91
1.0	0.71
1.5	0.58
2.0	0.50

**Correction factor for circulation rate ( $f_{rec}$ )**

Circulation rate	Correction factor
2	0.5
3	0.75
<b>4</b>	<b>1</b>
6	1.5
8	2
10	2.5


**Note**

*Applications 1, 2, 3, 4, 5, 10 and 14:*

$k_v$  values and capacities in the table are given for a regulating module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Relationship between a  $k_v$  value and number of turns for the manual regulating valve module is given on page 30.

*Applications 8, 9 and 11:*

$k_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station.

Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW], Circulation rate = 4,  $\Delta P = 0.5$  bar

**R 134a** ICF pumped liquid line without phase change

Type	Application no. (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Evaporating temperature [°C]						
			-40	-30	-20	-10	0	10	20
ICF20 (With ICM 20-A)	5A, 14A	0.60	7.8	7.5	7.3	6.9	6.6	6.3	5.9
ICF20 (With ICM 20-B, ICFE or ICFR 20A)	1-4, 5B, 5C, 8-11, 14B	2.40	31.3	30.2	29	27.8	26.5	25.1	23.6
ICF20 (With ICM 20-C)	14C	4.60	60	58	56	53	51	48	45
ICF25-40 (with REG 25-40 A and ICM 25A)	1A, 3A, 5A, 10A, 14A	6.00	78	76	73	69	66	63	59
ICF25-40 (with REG 25-40 B and ICM 25 B)	1B, 3B, 5B, 14B	12.00	156	151	145	139	132	125	118
ICF25-40 (with ICFE 25-40, no reg. valve)	8, 9, 11	20.00	260	252	242	231	220	209	197

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	2.24
0.2	1.58
0.3	1.29
0.4	1.12
<b>0.5</b>	<b>1.00</b>
0.6	0.91
1.0	0.71
1.5	0.58
2.0	0.50

Correction factor for circulation rate ( $f_{rec}$ )

Circulation rate	Correction factor
2	0.5
3	0.75
<b>4</b>	<b>1</b>
6	1.5
8	2
10	2.5

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW], Circulation rate = 4,  $\Delta P = 0.5$  bar

**R 404A** ICF pumped liquid line without phase change

Type	Application no. (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Evaporating temperature [°C]							
			-50	-40	-30	-20	-10	0	10	20
ICF20 (With ICM 20-A)	5A, 14A	0.60	6.9	6.6	6.3	6	8.4	5.3	4.9	4.5
ICF20 (With ICM 20-B, ICFE or ICFR 20A)	1-4, 5B, 5C, 8-11, 14B	2.40	27.6	26.5	25.1	23.9	33.5	21.3	19.8	18.1
ICF20 (With ICM 20-C)	14C	4.60	53	51	48	46	42	41	38	35
ICF25-40 (with REG 25-40 A and ICM 25A)	1A, 3A, 5A, 10A, 14A	6.00	69	66	63	60	55	53	49	45
ICF25-40 (with REG 25-40 B and ICM 25 B)	1B, 3B, 5B, 14B	12.00	138	132	125	119	110	106	99	91
ICF25-40 (with ICFE 25-40, no reg. valve)	8, 9, 11	20.00	230	220	209	199	183	177	165	151

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	2.24
0.2	1.58
0.3	1.29
0.4	1.12
<b>0.5</b>	<b>1.00</b>
0.6	0.91
1.0	0.71
1.5	0.58
2.0	0.50

Correction factor for circulation rate ( $f_{rec}$ )

Circulation rate	Correction factor
2	0.5
3	0.75
<b>4</b>	<b>1</b>
6	1.5
8	2
10	2.5



**Note**

*Applications 1, 2, 3, 4, 5, 10 and 14:*  
 $k_v$  values and capacities in the table are given for a regulating module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Relationship between a  $k_v$  value and number of turns for the manual regulating valve module is given on page 30.

*Applications 8,9 and 11:*  
 $k_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station.

Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
Circulation rate = 4,  
 $\Delta P = 0.5$  bar

**R 22** ICF pumped liquid line without phase change

Type	Application no. (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Evaporating temperature [°C]							
			-50	-40	-30	-20	-10	0	10	20
ICF20 (With ICM 20-A)	5A, 14A	0.60	8.4	8.2	7.9	7.5	7.2	6.9	6.5	6.1
ICF20 (With ICM 20-B, ICFE or ICFR 20A)	1-4, 5B, 5C, 8-11, 14B	2.40	33.8	32.6	31.4	30.1	28.8	27.4	26	24.4
ICF20 (With ICM 20-C)	14C	4.60	65	63	60	58	55	53	50	47
ICF25-40 (with REG 25-40 A and ICM 25A)	1A, 3A, 5A, 10A, 14A	6.00	84	82	79	75	72	69	65	61
ICF25-40 (with REG 25-40 B and ICM 25 B)	1B, 3B, 5B, 14B	12.00	169	163	157	151	144	137	130	122
ICF25-40 (with ICFE 25-40, no reg. valve)	8, 9, 11	20.00	281	272	262	251	240	229	217	203

**Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )**

$\Delta P$ (bar)	Correction factor
0.1	2.24
0.2	1.58
0.3	1.29
0.4	1.12
<b>0.5</b>	<b>1.00</b>
0.6	0.91
1.0	0.71
1.5	0.58
2.0	0.50

**Correction factor for circulation rate ( $f_{rec}$ )**

Circulation rate	Correction factor
2	0.5
3	0.75
<b>4</b>	<b>1</b>
6	1.5
8	2
10	2.5


**Note**

*Applications 1, 2, 3, 4, 5, 10 and 14:*

$k_v$  values and capacities in the table are given for a regulating module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Relationship between a  $k_v$  value and number of turns for the manual regulating valve module is given on page 30.

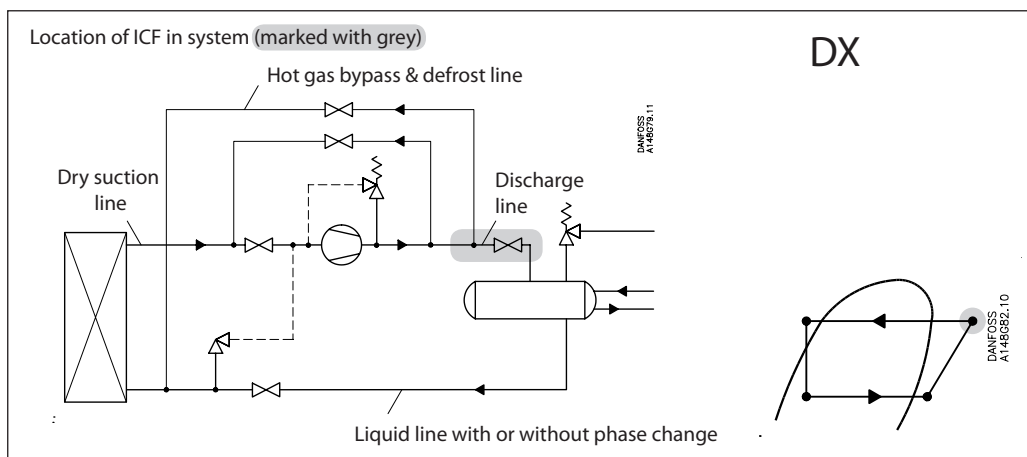
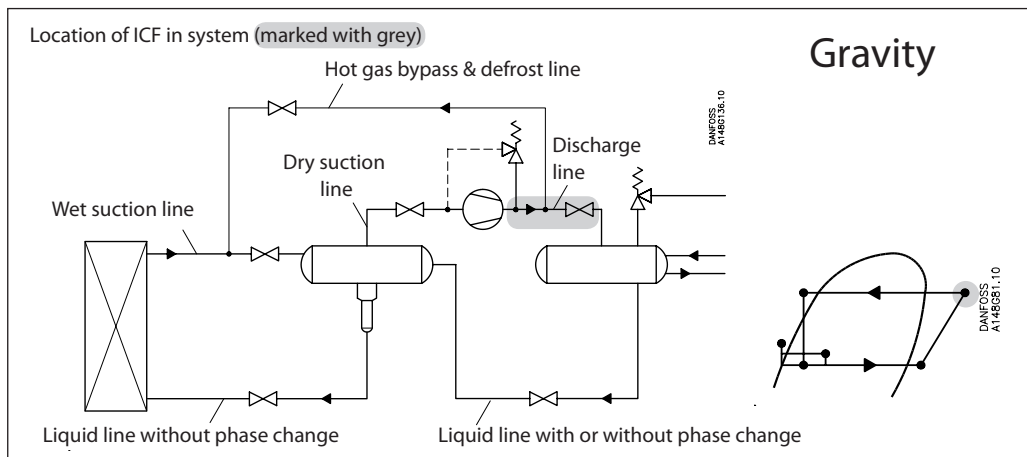
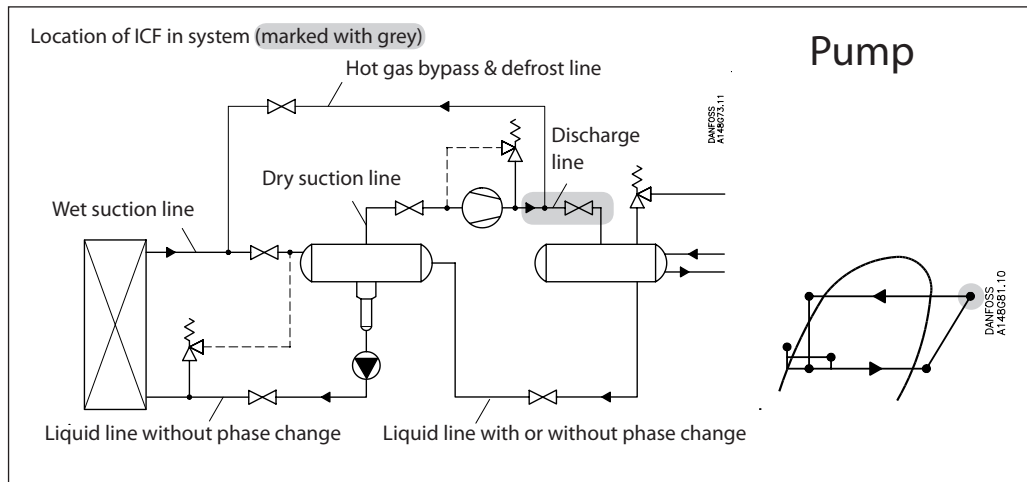
*Applications 8,9 and 11:*

$k_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station.

Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

Nominal capacities

ICF discharge line



**Nominal capacities**

In this example the ICF will be used in a discharge line, only as a solenoid valve (with the fitted additional components such as stop valves, filter and others depending on the selected application).

**Discharge line**

Hot gas line applications will be limited to application reference numbers 4,8,9 or 11 (see pages 14 - 17)

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:

- $T_e = -20^{\circ}\text{C}$
- $Q_o = 80 \text{ kW}$
- $T_{liq} = 10^{\circ}\text{C}$
- Max.  $\Delta p = 0.4 \text{ bar}$
- $T_{disch.} = 60^{\circ}\text{C}$

The capacity table is based on nominal condition (pressure drop  $\Delta p = 0.2 \text{ bar}$ ,  $T_{liq} = 30^{\circ}\text{C}$ ,  $P_{disch.} = 12 \text{ bar}$ ,  $T_{disch.} = 80^{\circ}\text{C}$ )

Therefore the actual capacity must be corrected to nominal condition by means of correction factors.

- Correction factor for  $\Delta p$  0.4 bar  $f_{\Delta p} = 0.71$
- Correction factor for liquid temperature  $f_{T_{liq}} = 0.92$
- Correction factor for discharge temperature  $T_{disch.} = 60^{\circ}\text{C}$ ,  $f_{T_{disch.}} = 0.97$

$$Q_n = Q_o \times f_{\Delta p} \times f_{T_{liq}} \times f_{T_{disch.}} = 80 \times 0.71 \times 0.92 \times 0.97 = 50.7 \text{ kW}$$

The capacity table gives a capacity of 131.71 kW for ICF 25-40, which is suitable for the installation.

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 30^{\circ}\text{C}$ ,  
 $\Delta p = 0.2 \text{ bar}$   
 Superheating =  $8^{\circ}\text{C}$

**R 717**

**Discharge line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^{\circ}\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	31.5	32.0	32.5	32.9	33.3	33.6	33.9	34.1
ICF 25-40	8, 9, 11	10.8	126.1	128.0	130.1	131.7	133.4	134.5	135.7	136.4

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Corr. factor for discharge temp. ( $T_{disch.}$ )

Discharge temp.	Correction factor
50 $^{\circ}\text{C}$	0.96
60 $^{\circ}\text{C}$	0.97
<b>80<math>^{\circ}\text{C}</math></b>	<b>1.00</b>
90 $^{\circ}\text{C}$	1.01
100 $^{\circ}\text{C}$	1.03
110 $^{\circ}\text{C}$	1.04
120 $^{\circ}\text{C}$	1.06

Corr. factor for liquid temp. ( $T_{liq}$ )

Liquid temp.	Correction factor
-20 $^{\circ}\text{C}$	0.82
-10 $^{\circ}\text{C}$	0.86
0 $^{\circ}\text{C}$	0.88
10 $^{\circ}\text{C}$	0.92
20 $^{\circ}\text{C}$	0.96
<b>30<math>^{\circ}\text{C}</math></b>	<b>1.00</b>
40 $^{\circ}\text{C}$	1.04
50 $^{\circ}\text{C}$	1.09

**Nominal capacities**

Capacity table at nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 10^{\circ}\text{C}$ ,  
 $\Delta p = 0.2 \text{ bar}$   
 Superheating =  $8^{\circ}\text{C}$

**R 744**

**Discharge line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^{\circ}\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	
ICF 20	4, 8, 9, 11	2.7	19.8	20.2	20.4	20.5	20.5	20.3	19.9	
ICF 25-40	8, 9, 11	10.8	79.4	80.8	81.7	81.9	81.9	81.2	79.6	

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Corr. factor for discharge temp. ( $T_{disch.}$ )

Discharge temp.	Correction factor
50 $^{\circ}\text{C}$	0.96
60 $^{\circ}\text{C}$	0.97
<b>80<math>^{\circ}\text{C}</math></b>	<b>1.00</b>
90 $^{\circ}\text{C}$	1.01
100 $^{\circ}\text{C}$	1.03
110 $^{\circ}\text{C}$	1.04
120 $^{\circ}\text{C}$	1.06

Corr. factor for liquid temp. ( $T_{liq}$ )

Liquid temp.	Correction factor
-20 $^{\circ}\text{C}$	0.52
-10 $^{\circ}\text{C}$	0.67
0 $^{\circ}\text{C}$	0.91
<b>10<math>^{\circ}\text{C}</math></b>	<b>1.00</b>
15 $^{\circ}\text{C}$	1.09



**Note**

$K_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2$  bar  
 Superheating =  $8^\circ\text{C}$

**R 134a**

**Discharge line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]						
			-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	25.7	26.9	28.2	29.4	30.5	31.7	32.8
ICF 25-40	8, 9, 11	10.8	102.8	107.8	112.7	117.6	122.1	126.8	131.2

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Corr. factor for discharge temp. ( $T_{disch}$ )

Discharge temp.	Correction factor
50 $^\circ\text{C}$	0.96
60 $^\circ\text{C}$	0.97
<b>80<math>^\circ\text{C}</math></b>	<b>1.00</b>
90 $^\circ\text{C}$	1.01
100 $^\circ\text{C}$	1.03
110 $^\circ\text{C}$	1.04
120 $^\circ\text{C}$	1.06

Corr. factor for liquid temp. ( $T_{liq}$ )

Liquid temp.	Correction factor
-20 $^\circ\text{C}$	0.66
-10 $^\circ\text{C}$	0.70
0 $^\circ\text{C}$	0.76
10 $^\circ\text{C}$	0.82
20 $^\circ\text{C}$	0.90
<b>30<math>^\circ\text{C}</math></b>	<b>1.00</b>
40 $^\circ\text{C}$	1.13
50 $^\circ\text{C}$	1.29

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2$  bar  
 Superheat =  $8^\circ\text{C}$

**R 404A**

**Discharge line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]						
			-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	23.8	25.5	27.1	28.7	30.2	31.8	33.1
ICF 25-40	8, 9, 11	10.8	95.3	101.9	108.5	114.8	120.9	127.0	132.4

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Corr. factor for discharge temp. ( $T_{disch}$ )

Discharge temp.	Correction factor
50 $^\circ\text{C}$	0.96
60 $^\circ\text{C}$	0.97
<b>80<math>^\circ\text{C}</math></b>	<b>1.00</b>
90 $^\circ\text{C}$	1.01
100 $^\circ\text{C}$	1.03
110 $^\circ\text{C}$	1.04
120 $^\circ\text{C}$	1.06

Corr. factor for liquid temp. ( $T_{liq}$ )

Liquid temp.	Correction factor
-20 $^\circ\text{C}$	0.55
-10 $^\circ\text{C}$	0.60
0 $^\circ\text{C}$	0.66
10 $^\circ\text{C}$	0.74
20 $^\circ\text{C}$	0.85
<b>30<math>^\circ\text{C}</math></b>	<b>1.00</b>
40 $^\circ\text{C}$	1.23
50 $^\circ\text{C}$	1.68

**Nominal capacities**

Capacity table for nominal conditions,  $Q_N$  [kW],  
 $T_{liq} = 30^\circ\text{C}$ ,  
 $\Delta P = 0.2$  bar  
 Superheat =  $8^\circ\text{C}$

**R 22**

**Discharge line**

Type	Application no. (see pages 14 - 17)	$K_v$ ( $\text{m}^3/\text{h}$ )	Evaporating temperature [ $^\circ\text{C}$ ]							
			-50	-40	-30	-20	-10	0	10	20
ICF 20	4, 8, 9, 11	2.7	10.2	71.6	73.6	76.0	78.0	79.6	81.6	83.2
ICF 25-40	8, 9, 11	10.8	40.6	286.4	294.4	304.0	312.0	318.4	326.4	332.8

Correction factor for  $\Delta P$  ( $f_{\Delta P}$ )

$\Delta P$ (bar)	Correction factor
0.1	1.41
<b>0.2</b>	<b>1.00</b>
0.3	0.82
0.4	0.71
0.5	0.63
0.6	0.58
1.0	0.45
1.5	0.37
2.0	0.32

Corr. factor for discharge temp. ( $T_{disch}$ )

Discharge temp.	Correction factor
50 $^\circ\text{C}$	0.96
60 $^\circ\text{C}$	0.97
<b>80<math>^\circ\text{C}</math></b>	<b>1.00</b>
90 $^\circ\text{C}$	1.01
100 $^\circ\text{C}$	1.03
110 $^\circ\text{C}$	1.04
120 $^\circ\text{C}$	1.06

Corr. factor for liquid temp. ( $T_{liq}$ )

Liquid temp.	Correction factor
-20 $^\circ\text{C}$	0.71
-10 $^\circ\text{C}$	0.75
0 $^\circ\text{C}$	0.80
10 $^\circ\text{C}$	0.86
20 $^\circ\text{C}$	0.92
<b>30<math>^\circ\text{C}</math></b>	<b>1.00</b>
40 $^\circ\text{C}$	1.09
50 $^\circ\text{C}$	1.22

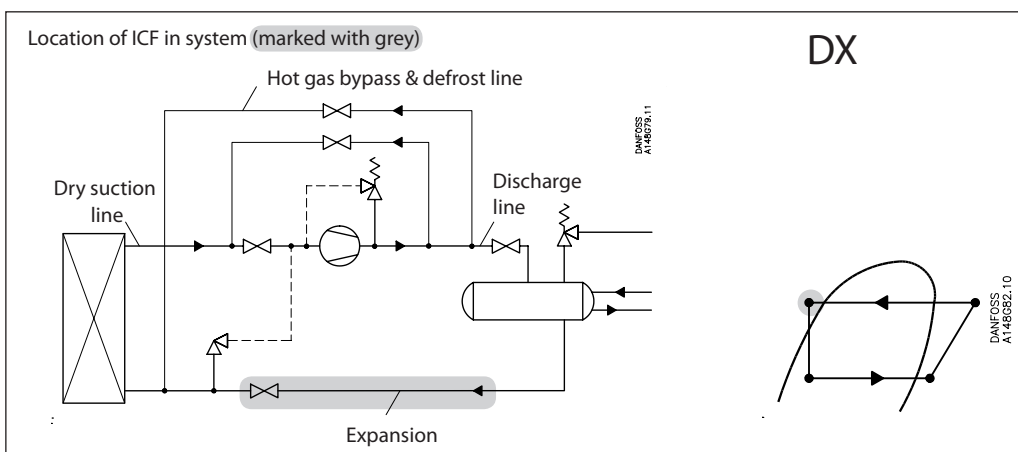
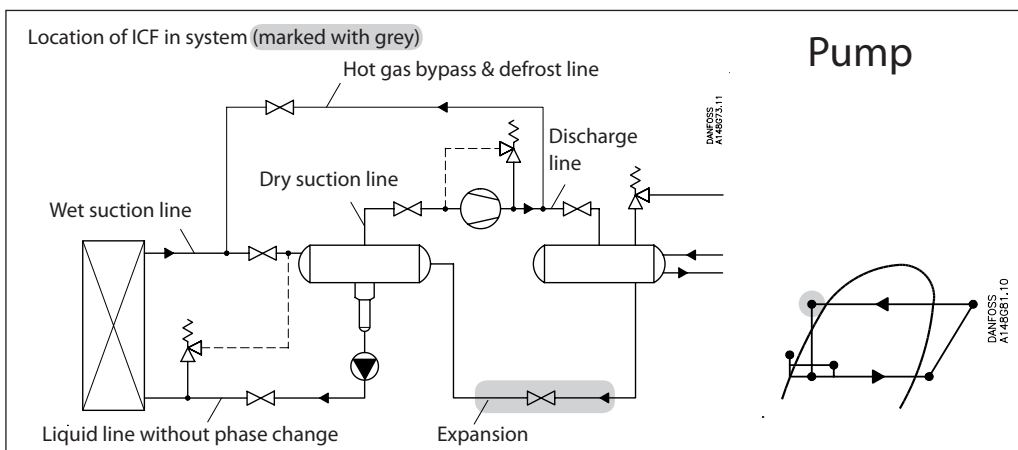


**Note**

$K_v$  values and capacities in the table are given for a solenoid module only, and are valid for selection of the valve. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

ICF expansion

Nominal capacities



Correction factors

When dimensioning, multiply the evaporator capacity by a correction factor  $k$  dependent on the subcooling  $\Delta t_{sub}$  just ahead of the valve. The corrected capacity\* can then be found in the capacity table.

Correction factors for subcooling

Subcooling K	2	4	10	15	20	25	30	35	40
R717	1.01	1	0.98	0.96	0.94	0.92	0.91	0.89	0.87
R744	1.02	1	0.95	0.90	0.86	0.82	0.79	0.75	0.73
R134a	1.03	1	0.93	0.88	0.84	0.80	0.76	0.73	0.70
R404A	1.04	1	0.91	0.83	0.78	0.73	0.68	0.65	0.61
R22	1.03	1	0.94	0.90	0.87	0.83	0.80	0.77	0.74

\* The capacity table is based on nominal conditions of subcooling just ahead of the valve of 4°K.



Nominal capacities

The ICF used for expansion will include the applications with electronic expansion valves type ICM, or the pulse with modulating valve type ICFA.

Application will be 5A, 5B, 5C, 6, 7, 12, 13, 14A, 14B, and 14C (see pages 14 - 17)

ICF expansion

Calculation example (R717 capacities):

An application has following running conditions:

$$T_e = -10^{\circ}\text{C} \sim P_e = 2.9 \text{ bar}$$

$$T_c = +30^{\circ}\text{C} \sim P_c = 11.7 \text{ bar}$$

$$Q_o = 1500 \text{ kW}$$

$$\Delta T_{\text{sub}} = 20 \text{ K}$$

The capacity table is based on nominal condition with a subcooling of 4 K.

Therefore the actual capacity must be corrected to nominal condition by means of correction factors.

Correction factor for subcooling = 0.94  
Pressure drop across the valve is  
11.7 bar – 2.9 bar = 8.8 bar

$$Q_n = Q_o \times 0.94 = 1500 \text{ kW} \times 0.94 = 1410 \text{ kW}$$

From the capacity table a ICF 25-40 with ICM 25A has a capacity of 3080 kW at a pressure drop of 8 bar, thus suitable for the installation.

For applications with hand regulating valve ICFR 20A (application numbers 1, 2, 3 and 10), please use the chart on page 30 to find the setting on the hand regulating valve.

Expansion

Capacities for nominal conditions,  $Q_n$  (kW)

R 717

Type	Application number (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Pressure drop across valve $\Delta p$ bar					
			1	2	4	8	12	16

Pressure drop across valve $\Delta p$ bar					
1	2	4	8	12	16

Evaporating temperature 10°C

ICF20 with ICFA 10	6, 7, 12, 13	0.25		59.10	78.90	104	120	131
ICF20 with ICM 20-A	5A, 14A, 5	0.60	85.90	119	163	217	253	279
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	400	400	400	400	400	400
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	498	686	930	1230	1435	1587
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	1274	1739	2337	3080	3449	3449
ICF25-40 with REG 25-40 A and ICM 25A	10A, 14A	6	1274	1739	2337	3080	3575	3970

Evaporating temperature 0°C

	59.10	78.90	104	120	131
90	132	167	221	256	282
400	400	400	400	400	400
515	705	950	1245	1450	1594
Please use DIRcalc for capacity selection					
1310	1773	2370	3100	3449	3449
1310	1773	2370	3100	3600	3980

Evaporating temperature -10°C

ICF20 with ICFA 10	6, 7, 12, 13	0.25		59.10	78.90	104	120	131
ICF20 with ICM 20-A	5A, 14A, 5	0.60	92	17	170	224	258	284
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	400	400	400	400	400	400
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	527	715	955	1253	1452	1594
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	1274	1739	2337	3080	3449	3449
ICF25-40 with REG 25-40 A and ICM 25A	10A, 14A	6	1274	1739	2337	3080	3575	3970

Evaporating temperature -20°C

	59.10	78.90	104	120	131
94.50	129	172	225	258	284
400	400	400	400	400	400
535	718	957	1250	1450	1594
Please use DIRcalc for capacity selection					
1310	1773	2370	3100	3449	3449
1310	1773	2370	3100	3600	3980

Evaporating temperature -30°C

ICF20 with ICFA 10	6, 7, 12, 13	0.25		59.10	78.90	104	120	131
ICF20 with ICM 20-A	5A, 14A, 5	0.60	96	130	173	225	258	282
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	400	400	400	400	400	400
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	532	716	950	1240	1435	1580
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	1310	1740	2310	3030	3449	3449
ICF25-40 with REG 25-40 A and ICM 25A	10A, 14A	6	1310	1740	2310	3030	3530	3880

Evaporating temperature -40°C

	59.10	78.90	104	120	131
97	131	173	224	256	280
400	400	400	400	400	400
527	705	940	1230	1420	1555
Please use DIRcalc for capacity selection					
1270	1690	2270	2990	3449	3449
1270	1690	2270	2990	3480	3830

Evaporating temperature -50°C

ICF20 with ICFA 10	6, 7, 12, 13	0.25		59.10	78.90	104	120	131
ICF20 with ICM 20-A	5A, 14A, 5	0.60	97.50	131	172	222	253	276
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	400	400	400	400	400	400
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	512	690	925	1210	1400	1535
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	1220	1650	2220	2950	3420	3449
ICF25-40 with REG 25-40 A and ICM 25A	10A, 14A	6	1220	1650	2220	2950	3420	3780



Note

$K_v$  values and capacities in the table are given for a regulating module, and are valid for selection of the valve. Only capacities marked gray are given for a solenoid valve module.

Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station.

If you have any questions regarding selection, please contact your local Danfoss dealer.

Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

Expansion

Capacities for nominal conditions,  $Q_n$  (kW)

Type	Application number (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Pressure drop across valve $\Delta p$ bar					
			1	2	4	8	12	16
<b>Evaporating temperature -10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		14.38	19.79	26.50	30.83	33.75
ICF20 with ICM 20-A	5A, 14A, 5	0.60	24.70	34.50	47.50	63.60	74	81
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	140	140	140	140	140	140
ICF20 with ICM 20-B or ICFR 20A	10, 14B	4.60	143	200	275	368	428	470
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	368	513	705	940	1090	1195

Pressure drop across valve $\Delta p$ bar					
1	2	4	8	12	16
<b>Evaporating temperature -20°C</b>					
	15.75	21.67	29	33.75	36.88
27.10	37.80	52	69.60	81	88.50
140	140	140	140	140	140
157	219	302	402	468	512
Please use DIRcalc for capacity selection					
402	563	770	1025	1190	1300

<b>Evaporating temperature -30°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		17.08	23.46	31.25	36.17	39.58
ICF20 with ICM 20-A	5A, 14A, 5	0.60	29.70	41	56.30	75	86.80	95
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	140	140	140	140	140	140
ICF20 with ICM 20-B or ICFR 20A	10, 14B	4.60	172	238	325	432	500	545
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	440	610	828	1100	1270	1380

<b>Evaporating temperature -40°C</b>					
	18.33	25	32.92	38	41.46
32.10	44	60	79	91.20	99.50
140	140	140	140	140	140
186	256	345	455	525	571
Please use DIRcalc for capacity selection					
478	655	880	1155	1325	1444

<b>Evaporating temperature -50°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		19.17	26.04	34.38	39.50	42.92
ICF20 with ICM 20-A	5A, 14A, 5	0.60	33.30	46	62.50	82.50	94.80	103
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	140	140	140	140	140	140
ICF20 with ICM 20-B or ICFR 20A	10, 14B	4.60	193	266	359	472	540	588
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	494	678	910	1190	1360	1480

Expansion

Capacities for nominal conditions,  $Q_n$  (kW)

Type	Application number (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Pressure drop across valve $\Delta p$ bar					
			1	2	4	8	12	16
<b>Evaporating temperature 10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		10.83	14	16.88	17.79	17.71
ICF20 with ICM 20-A	5A, 14A, 5	0.60	19.40	26	33.60	40.50	42.70	42.50
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	112	149	192	230	243	242
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	285	377	480	575	607	606

Pressure drop across valve $\Delta p$ bar					
1	2	4	8	12	16
<b>Evaporating temperature 0°C</b>					
	11.17	14.29	17	17.71	17.54
20.10	26.80	34.30	40.80	42.50	42.10
80	80	80	80	80	80
116	153	194	231	242	240
Please use DIRcalc for capacity selection					
292	383	482	575	604	602

<b>Evaporating temperature -10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		11.42	14.38	16.88	17.50	17.29
ICF20 with ICM 20-A	5A, 14A, 5	0.60	20.70	27.40	34.50	40.50	42	41.50
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	118	154	194	229	238	235
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	296	383	481	568	593	587

<b>Evaporating temperature -20°C</b>					
	11.50	14.38	16.67	17.13	16.71
21.10	27.60	34.50	40	41.10	40.10
80	80	80	80	80	80
119	154	193	225	233	228
Please use DIRcalc for capacity selection					
295	380	474	555	575	568

<b>Evaporating temperature -30°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		59.10	78.90	104	120	131
ICF20 with ICM 20-A	5A, 14A, 5	0.60	96	130	173	225	258	282
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	118	152	189	219	225	218
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	290	372	463	540	555	545

<b>Evaporating temperature -40°C</b>					
	59.10	78.90	104	120	131
97	131	173	224	256	280
80	80	80	80	80	80
116	149	184	211	216	208
Please use DIRcalc for capacity selection					
280	361	448	520	532	516



Note

$K_v$  values and capacities in the table are given for a regulating module, and are valid for selection of the valve.

Only capacities marked gray are given for a solenoid valve module.

Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station.

If you have any questions regarding selection, please contact your local Danfoss dealer.

Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

**Expansion**

Capacities for nominal conditions,  $Q_n$  (kW)

**R 404A**

Type	Application number (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Pressure drop across valve $\Delta p$ bar					
			1	2	4	8	12	16
<b>Evaporating temperature 10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		8.88	11.58	14.08	14.71	14.38
ICF20 with ICM 20-A	5A, 14A, 5	0.60	15.70	21.30	27.80	33.80	35.30	34.50
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	60	60	60	60	60	60
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	91	123	160	194	203	198
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	233	313	406	490	510	500
<b>Evaporating temperature -10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		9.79	12.63	15.04	15.63	15.21
ICF20 with ICM 20-A	5A, 14A, 5	0.60	17.40	23.50	30.30	36.10	37.50	36.50
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	60	60	60	60	60	60
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	101	135	173	206	214	209
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	257	340	435	515	535	525
<b>Evaporating temperature -30°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		10.29	13.04	15.21	15.54	14.92
ICF20 with ICM 20-A	5A, 14A, 5	0.60	18.70	24.70	31.30	36.50	37.30	35.80
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	50	50	50	50	50	50
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	107	140	176	205	211	204
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	269	349	437	510	525	508
<b>Evaporating temperature -50°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		10.42	12.88	14.58	14.63	13.83
ICF20 with ICM 20-A	5A, 14A, 5	0.60	19.50	25	30.90	35	35.10	33.20
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	40	40	40	40	40	40
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	108	138	171	196	198	188
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A, 10A, 14A	6	265	335	418	484	490	468

Pressure drop across valve $\Delta p$ bar						
1	2	4	8	12	16	
<b>Evaporating temperature 0°C</b>						
	9.38	12.21	14.67	15.33	14.96	
16.60	22.50	29.30	35.20	36.80	35.90	
60	60	60	60	60	60	
96.50	130	168	201	210	205	
Please use DIRcalc for capacity selection						
246	329	423	508	528	518	
<b>Evaporating temperature -20°C</b>						
	10.13	12.92	15.21	15.71	15.21	
18.20	24.30	31	36.50	37.70	36.50	
50	50	50	50	50	50	
105	139	176	207	214	208	
Please use DIRcalc for capacity selection						
265	348	439	515	535	50	
<b>Evaporating temperature -40°C</b>						
	10.42	13.04	14.92	15.13	14.46	
19.20	25	31.30	35.80	36.30	34.70	
50	50	50	50	50	50	
109	140	174	202	205	197	
Please use DIRcalc for capacity selection						
269	345	428	499	510	490	

**Expansion**

Capacities for nominal conditions,  $Q_n$  (kW)

**R 22**

Type	Application number (see pages 14 - 17)	$K_v$ (m <sup>3</sup> /h)	Pressure drop across valve $\Delta p$ bar					
			1	2	4	8	12	16
<b>Evaporating temperature 10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		11.50	15.33	19.46	21.54	22.58
ICF20 with ICM 20-A	5A, 14A, 5	0.60	20.10	27.60	36.80	46.70	51.70	54.20
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	117	160	212	268	297	312
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	299	406	535	663	663	663
ICF25-40with REG 25-40 A and ICM 25A	10A, 14A	6	299	406	535	675	746	785
<b>Evaporating temperature -10°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		12.42	16.25	20.33	22.38	23.25
ICF20 with ICM 20-A	5A, 14A, 5	0.60	21.90	29.80	39	48.80	53.70	55.80
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	126	170	223	278	305	318
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	321	430	557	663	663	663
ICF25-40with REG 25-40 A and ICM 25A	10A, 14A	6	321	430	557	695	764	796
<b>Evaporating temperature -30°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		12.92	16.67	20.54	22.29	23.04
ICF20 with ICM 20-A	5A, 14A, 5	0.60	23.20	31	40	49.30	53.50	55.30
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	132	175	225	277	302	313
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	329	433	556	663	663	663
ICF25-40with REG 25-40 A and ICM 25A	10A, 14A	6	329	433	556	685	752	783
<b>Evaporating temperature -50°C</b>								
ICF20 with ICFA 10	6, 7, 12, 13	0.25		13.04	16.58	20	21.58	22.08
ICF20 with ICM 20-A	5A, 14A, 5	0.60	23.80	31.30	39.80	48	51.80	53
ICF20 with ICM 20-B or ICFR 20A	1, 2, 3, 5B	2.40	80	80	80	80	80	80
ICF20 with ICM 20-B or ICFR 20A	10, 14B	2.40	131	172	220	269	291	300
ICF20 with ICM 20-C	5C, 14C	4.60	Please use DIRcalc for capacity selection					
ICF25-40 with REG 25-40 A and ICM 25A	1A, 3A, 5A	6	320	418	540	663	663	663
ICF25-40with REG 25-40 A and ICM 25A	10A, 14A	6	320	418	540	663	720	747

Pressure drop across valve $\Delta p$ bar						
1	2	4	8	12	16	
<b>Evaporating temperature 0°C</b>						
	12	15.88	20	22.08	23.08	
21.10	28.80	38.10	48	53	55.40	
80	80	80	80	80	80	
122	166	218	274	303	316	
Please use DIRcalc for capacity selection						
312	420	550	663	663	663	
312	420	550	687	760	795	
<b>Evaporating temperature -20°C</b>						
	12.71	16.60	20.54	22.38	23.21	
22.70	30.50	39.8	49.30	53.70	55.70	
80	80	80	80	80	80	
130	174	225	279	305	317	
Please use DIRcalc for capacity selection						
328	435	559	663	663	663	
328	435	559	693	760	792	
<b>Evaporating temperature -40°C</b>						
	13.04	16.71	20.33	22	22.63	
23.60	31.30	40.10	48.80	52.80	54.30	
80	80	80	80	80	80	
133	174	223	274	298	308	
Please use DIRcalc for capacity selection						
327	428	550	663	663	663	
327	428	550	676	740	765	



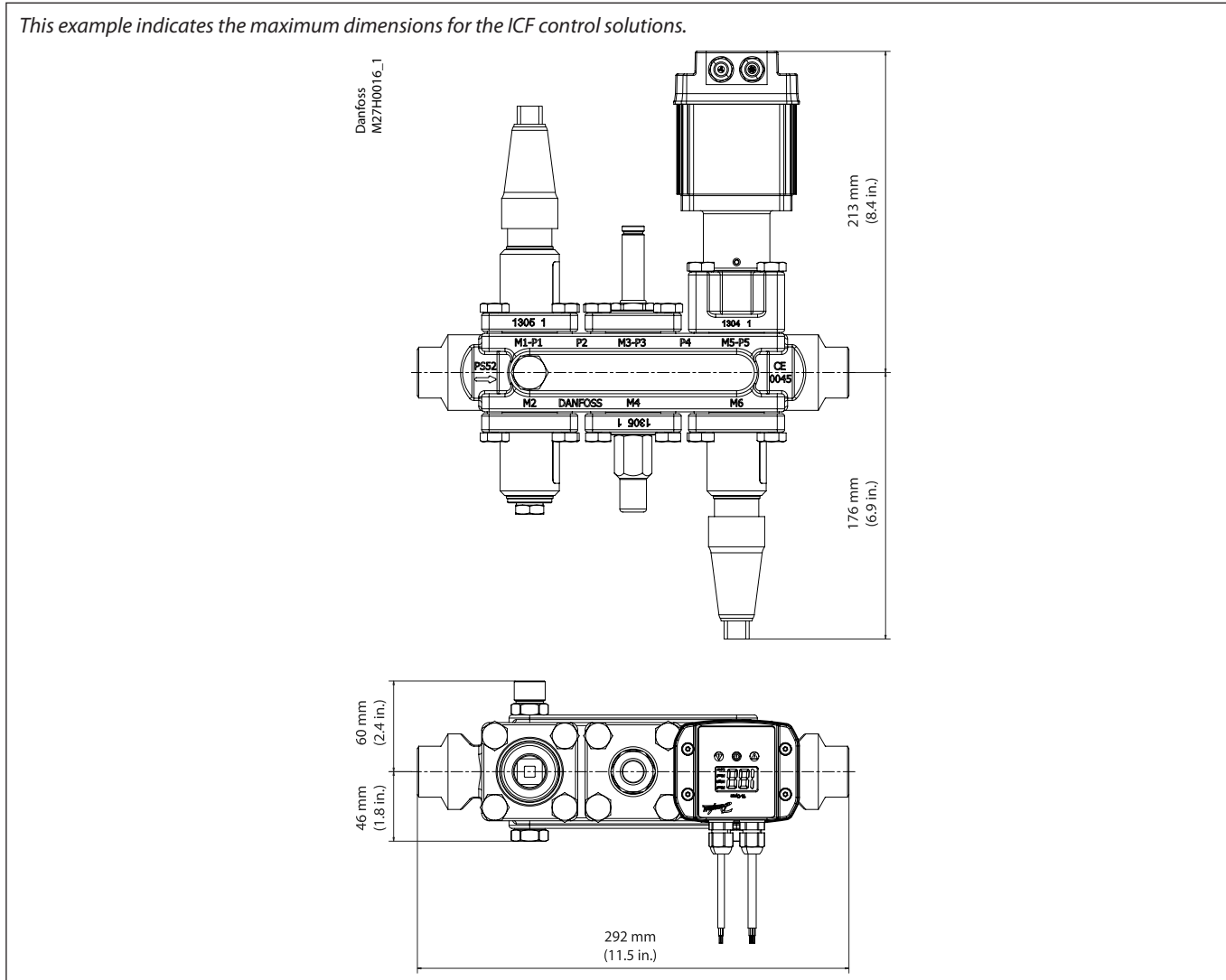
**Note**

$K_v$  values and capacities in the table are given for a regulating module, and are valid for selection of the valve. Only capacities marked gray are given for a solenoid valve module. Please use DIRcalc software for more accurate calculation of the capacity for a complete ICF valve station. If you have any questions regarding selection, please contact your local Danfoss dealer. Danfoss can accept no responsibility for possible errors in these capacity tables leading to wrong selection of the valve.

Dimensions and weight

ICF 20-6

This example indicates the maximum dimensions for the ICF control solutions.



Weight

Connection	Number of side ports*	ICF 20-6-1		ICF 20-6-2		ICF 20-6-3		ICF 20-6-4		ICF 20-6-5A**		ICF 20-6-5B**		ICF 20-6-5C**		ICF 20-6-6		ICF 20-6-7	
		kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs
20 D (3/4 in.)	4	8.7	19.3	8.8	19.3	8.9	19.6			9.9	21.8	9.9	21.8	9.9	21.8	8.2	18.1	8.3	18.3
25 D (1 in.)	None	8.7	19.3	8.8	19.3	8.9	19.6	8.2	18.03	9.9	21.8	9.9	21.8	9.9	21.8				
	4	8.7	19.3	8.8	19.3	8.9	19.6	8.2	18.03	9.9	21.8	9.9	21.8	9.9	21.8				
32 D (1 1/4 in.)	4	8.7	19.3	8.8	19.3	8.9	19.6	8.2	18.03	10.1	22.3	10.1	22.3	10.1	22.3				
20 A (3/4 in.)	4	8.7	19.3	8.8	19.3	8.9	19.6	8.2	18.03	9.9	21.8	9.9	21.8	9.9	21.8	8.2	18.1	8.3	18.3
20 SOC (3/4 in.)	6	9.0	19.9	9.1	20.0	9.2	20.2			9.9	21.8	9.9	21.8	9.9	21.8	8.5	18.7	8.6	19.0
	None	9.0	19.9	9.1	20.0	9.2	20.2	8.5	18.70	10.1	22.3	10.1	22.3	10.1	22.3				
25 SOC (1 in.)	6	9.0	19.9	9.1	20.0	9.2	20.2	8.5	18.70	10.1	22.3	10.1	22.3	10.1	22.3				
	None	9.0	19.9	9.1	20.0	9.2	20.2	8.5	18.70	10.2	22.5	10.2	22.5	10.2	22.5				
32 SOC (1 1/4 in.)	6	9.0	19.9	9.1	20.0	9.2	20.2	8.5	18.70	10.2	22.5	10.2	22.5	10.2	22.5				

D = Butt-weld DIN (2448)  
A = Butt-weld ANSI (B 36.10)  
SOC = Socket welding ANSI (B 16.11)

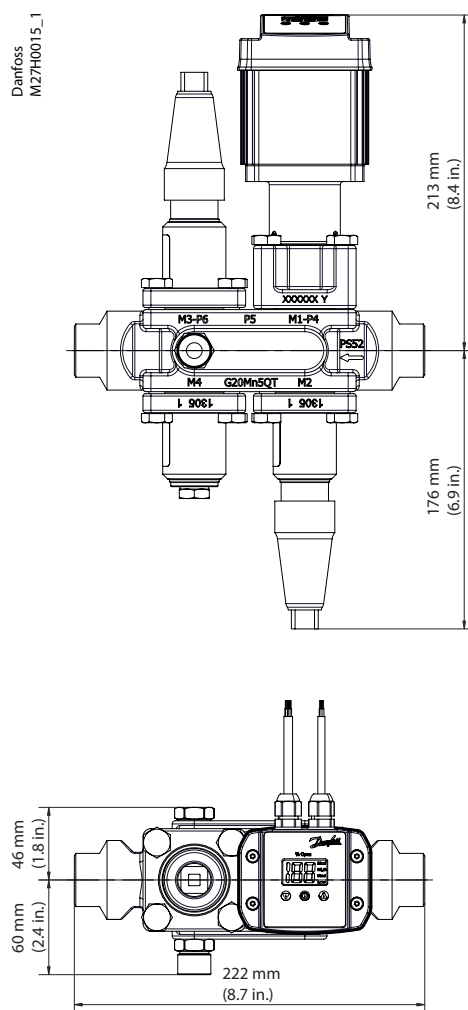
\* Four side ports include four blind plugs and one 1/2 in. connector. Side ports in P2/P7 and P5/P10. Six side ports include six blind plugs. Side ports in P2/P7, P4/P9 and P5/P10.

\*\* Including ICAD 600 actuator

Dimensions and weight

ICF 20-4

This example indicates the maximum dimensions for the ICF control solutions.



Weight

Connection	Number of side ports*	ICF 20-4-8		ICF 20-4-9		ICF 20-4-10		ICF 20-4-11		ICF 20-4-12		ICF 20-4-13		ICF 20-4-14A**		ICF 20-4-14B**		ICF 20-4-14C**	
		kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs
20 D (3/4 in.)	2					5.9	12.9			5.9	12.9	5.9	12.9	6.4	14.2				
25 D (1 in.)	None	5.4	12	5.9	12.9	5.9	12.9	5.6	12.2					6.4	14.2	6.4	14.2	6.4	14.2
	2	5.4	12	5.9	12.9	5.9	12.9	5.6	12.2					6.4	14.2	6.4	14.2	6.4	14.2
32 D (1 1/4 in.)	2	5.4	12	5.9	12.9	5.9	12.9	5.6	12.2									6.4	14.2
20 A (3/4 in.)	2	5.4	12	5.9	12.9	5.9	12.9	5.6	12.2	5.9	12.9	5.9	12.9	6.4	14.2	6.4	14.2	6.4	14.2
20 SOC (3/4 in.)	4					6.0	13.3			6.0	13.2	6.0	13.3	6.6	14.5				
	None	5.6	6.6	6.0	13.3	6.0	13.3	5.7	12.6					6.6	14.5	6.6	14.5	6.6	14.5
25 SOC (1 in.)	4	5.6	6.6	6.0	13.3	6.0	13.3	5.7	12.6					6.6	14.5	6.6	14.5	6.6	14.5
	None	5.6	6.6	6.0	13.3	6.0	13.3	5.7	12.6									6.6	14.5
32 SOC (1 1/4 in.)	4	5.6	6.6	6.0	13.3	6.0	13.3	5.7	12.6									6.6	14.5

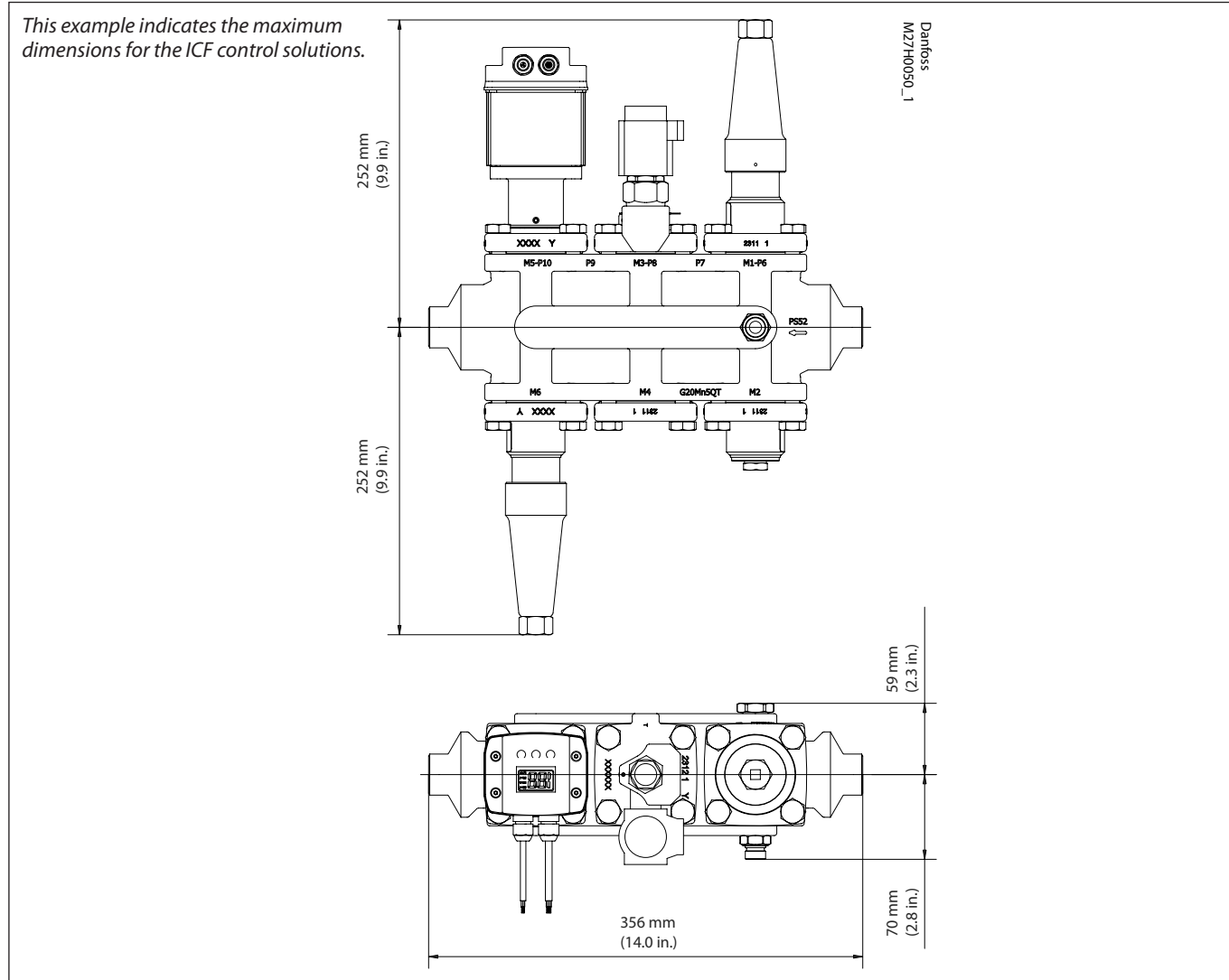
- D = Butt-weld DIN (2448)
- A = Butt-weld ANSI (B 36.10)
- SOC = Socket welding ANSI (B 16.11)

\* Two side ports include two blind plugs and one 1/2 in. connector. Side ports in P2/P5. Four side ports include four blind plugs. Side ports in P2/P5 and P3/P6.

\*\* Including ICAD 600 actuator

Dimensions and weight

ICF 25-6 → ICF 40-6



Weight

Connection	Number of side ports*	ICF 25-6-1A ICF 32-6-1A/B ICF 40-6-1B		ICF 25-6-3A ICF 32-6-3A/B ICF 40-6-3B		ICF 25-6-5A** ICF 32-6-5A/B** ICF 40-6-5B**		ICF 25-6-15A ICF 32-6-15B ICF 40-6-15B	
		kg	lbs	kg	lbs	kg	lbs	kg	lbs
25 D (1 in.)	None	23.6	52.0	23.8	52.5	23.8	52.5	23.6	52.0
32 D (1 1/4 in.)	None	23.8	52.5	24.0	52.9	24.0	52.9	23.8	52.5
40 D (1 1/2 in.)	None	24.0	52.9	24.2	53.4	24.2	53.4	24.0	52.9
25 D (1 in.)	4	23.6	52.0	23.8	52.5	23.8	52.5	23.6	52.0
32 D (1 1/4 in.)	4	23.8	52.5	24.0	52.9	24.0	52.9	23.8	52.5
40 D (1 1/2 in.)	4	24.0	52.9	24.2	53.4	24.2	53.4	24.0	52.9
25 SOC (1 in.)	None	23.6	52.0	23.8	52.5	23.8	52.5	23.6	52.0
32 SOC (1 1/4 in.)	None	23.8	52.5	24.0	52.9	24.0	52.9	23.8	52.5
40 SOC (1 1/2 in.)	None	24.0	52.9	24.2	53.4	24.2	53.4	24.0	52.9
25 SOC (1 in.)	6	23.6	52.0	23.8	52.5	23.8	52.5	23.6	52.0
32 SOC (1 1/4 in.)	6	23.8	52.5	24.0	52.9	24.0	52.9	23.8	52.5
40 SOC (1 1/2 in.)	6	24.0	52.9	24.2	53.4	24.2	53.4	24.0	52.9
32 A (1 1/4 in.)	4	23.8	52.5	24.0	52.9	24.0	52.9	23.8	52.5

D = Butt-weld DIN (2448) – A = Butt-weld ANSI (B 36.10) – SOC = Socket welding ANSI (B 16.11)

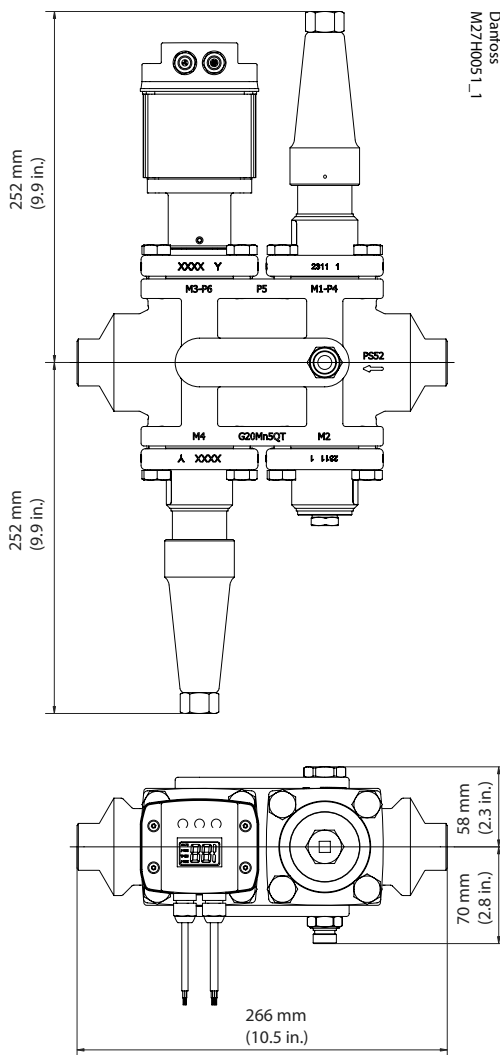
\* Four side ports include four blind plugs and one 1/2 in. connector. Side ports in P2/P7 and P5/P10. Six side ports include six blind plugs. Side ports in P2/P7, P4/P9 and P5/P10.

\*\* Including ICAD 600 actuator

Dimensions and weight

ICF 25-4 → ICF 40-4

This example indicates the maximum dimensions for the ICF control solutions.



Weight

Connection	Number of side ports*	ICF 25-4-8 ICF 32-4-8 ICF 40-4-8		ICF 25-4-9 ICF 32-4-9 ICF 40-4-9		ICF 25-4-10A ICF 32-4-10A/B ICF 40-4-10B		ICF 25-4-11 ICF 32-4-11 ICF 40-4-11		ICF 25-4-14A** ICF32-4-14A/B** ICF40-4-14B**	
		kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs
25 D (1 in.)	None	14.6	32.2	14.8	32.6	14.8	32.6	14.8	32.6	14.8	32.6
32 D (1 1/4 in.)	None	14.8	32.6	15.1	33.3	15.1	33.3	15.1	33.3	15.1	33.3
40 D (1 1/2 in.)	None	15.2	33.5	15.4	34.0	15.4	34.0	15.4	34.0	15.4	34.0
25 D (1 in.)	2	14.6	32.2	14.8	32.6	14.8	32.6	14.8	32.6	14.8	32.6
32 D (1 1/4 in.)	2	14.8	32.6	15.1	33.3	15.1	33.3	15.1	33.3	15.1	33.3
40 D (1 1/2 in.)	2	15.2	33.5	15.4	34.0	15.4	34.0	15.4	34.0	15.4	34.0
25 SOC (1 in.)	None	14.6	32.2	14.8	32.6	14.8	32.6	14.8	32.6	14.8	32.6
32 SOC (1 1/4 in.)	None	14.8	32.6	15.1	33.3	15.1	33.3	15.1	33.3	15.1	33.3
40 SOC (1 1/2 in.)	None	15.2	33.5	15.4	34.0	15.4	34.0	15.4	34.0	15.4	34.0
25 SOC (1 in.)	4	14.6	32.2	14.8	32.6	14.8	32.6	14.8	32.6	14.8	32.6
32 SOC (1 1/4 in.)	4	14.8	32.6	15.1	33.3	15.1	33.3	15.1	33.3	15.1	33.3
40 SOC (1 1/2 in.)	4	15.2	33.5	15.4	34.0	15.4	34.0	15.4	34.0	15.4	34.0
32 A (1 1/4 in.)	None	14.8	32.6	15.0	33.1	15.0	33.1	15.0	33.1	15.0	33.1
32 A (1 1/4 in.)	2	14.8	32.6	15.0	33.1	15.0	33.1	15.0	33.1	15.0	33.1

D = Butt-weld DIN (2448) – A = Butt-weld ANSI (B 36.10) – SOC = Socket welding ANSI (B 16.11)

\* Four side ports include four blind plugs and one 1/2 in. connector. Side ports in P2/P7 and P5/P10. Six side ports include six blind plugs. Side ports in P2/P7, P4/P9 and P5/P10.

\*\* Including ICAD 600 actuator

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