ENGINEERING TOMORROW

Data sheet

# Pilot-operated servo valve
## Type ICS



ICS pilot-operated servo valves belong to the ICV (Industrial Control Valve) family.

The valve comprises three main components: valve body, function module and top cover.

ICS pilot-operated servo valves are pilot operated valves for regulating pressure, temperature and ON/OFF function in refrigeration systems. ICS valves are designed for low and high-pressure refrigerants.

ICS valves can be used on the high and low-pressure sides, in wet and dry suction lines and in liquid lines without phase change (i.e. where no expansion takes place in the valve).

The function of ICS valves is dependent on the pilot pressure applied from either a pilot valve or external pilot pressure source.

ICS 1 pilot has one pilot pressure connection and ICS 3 pilot has three pilot pressure connections.

**Features**

- Designed for industrial refrigeration applications for a maximum working pressure of 52 bar g/754 psi g.
- Applicable to HCFC, HFC, R717 (Ammonia) and R744 ($CO_2$).
- Direct coupled connections.
- Connection types include butt weld, socket weld, solder and threaded connections.
- Low temperature steel body.
- Low weight and compact design.
- V-port regulating cone ensures optimum regulating accuracy particularly at part load.
- Function module has a QPQ surface treated insert and a steel piston ring ensuring precise control accuracy.
- ICV 4 in., 5 in. and 6 in. ANSI with NPT threaded pressure outlet in the outlet of the valve.
- Replaceable Teflon valve seat for ICS 25-80.
- Maintenance spare part kit available for ICS 100-150.
- Modular Concept:
  - Each valve body is available with several different connection types and sizes.
  - Valve overhaul on ICS 25-80 is done by replacing the function module.
  - Possible to convert ICS pilot-operated servo valve to ICM motor operated valve.
- Manual opening.
- The ICS valve is a multifunction valve where several pilot valves can be mounted into the pilot ports.
- The standard range of pilot valves can be used on all sizes of ICS valves. Pilot valves can be either screwed directly into the ICS valve, thus eliminating the need for solder/weld connections or external pilot lines.
- Pressure gauge connection port to measure valve inlet pressure.
- The top cover can be rotated into any possible position without affecting the operation of the valve.
- To get an updated list of certification on the products please contact your local Danfoss Sales Company.

**Contents** **Page**

Features ..... 1
Design ..... 3
Technical data ..... 3
The ICS Concept ..... 4
Function ..... 6
Material specification ..... 8
Configuration examples ..... 10
Nominal capacities ..... 19
Ordering ..... 53
Spare parts ..... 58
Accessories ..... 58
Dimensions and weights ..... 62
Connections ..... 70

## Design

ICS valves are designed as pilot operated valves requiring minimal pressure differential to open. If the pressure difference is 0 bar/0 psi, the ICS valve will be closed. If the pressure difference is 0.2 bar/3 psi or more, the ICS valve will be fully open. At pressure differences between 0.07 bar/1 psi and 0.2 bar /3 psi, the opening degree will be correspondingly proportional.

The ICS is available for use with either one or three pilot valves.

Two of the three pilot pressure connections (S1 and S2) are connected in series whilst the third (P) is connected in parallel to S1 and S2. This allows different combinations of pilot valves to be used, thus providing numerous variations in control functions.

*Connections*
There is a very wide range of connection types available with ICS valves:

- D: Butt weld, DIN (2448)
- A: Butt weld, ANSI (B 36.10)
- J: Butt weld, JIS (B S 602)
- SOC: Socket weld, ANSI (B 16.11)
- SD: Solder connection, DIN (2856)
- SA: Solder connection, ANSI (B 16.22)
- FPT: Female pipe thread (ANSI/ASME B 1.20.1)

*Approvals*
The ICV valve concept is designed to fulfill global refrigeration requirements.
For specific approval information, please contact Danfoss.

The ICS valves are approved in accordance with the European standard specified in the Pressure Equipment Directive and are CE marked.
For further details / restrictions - see Installation Instruction

*Valve body and top cover material*
Low temperature steel

| ICS valves | | | |
|---|---|---|---|
| Nominal bore | DN≤ 25 (1 in.) | DN 32-65 (1¼ - 2½ in.) | DN 80-125 (3 - 5 in.) |
| Classified for | Fluid group I | | |
| Category | Article 3, paragraph 3 | II | III |

## Technical data

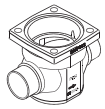
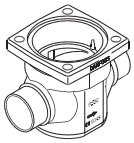
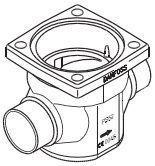
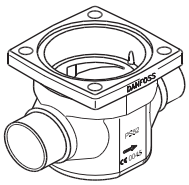
- *Refrigerants*
  Applicable to HCFC, HFC, R717(Ammonia) and R744 ($CO_2$).
  Use with flammable hydrocarbons cannot be recommended; please contact Danfoss.
- *Temperature range*
  –60/+120°C (–76/+248°F).
- *Surface protection*
  *ICS 25-150*:
  The external surface is zinc-chromated to provide good corrosion protection.
- *Pressure range*
  The valve is designed for:
  Max. working pressure: 52 bar g (754 psig)

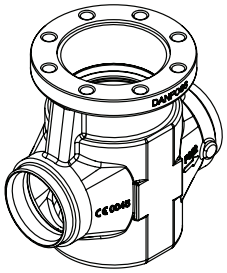
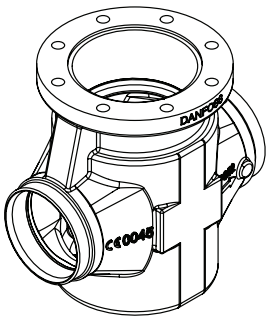
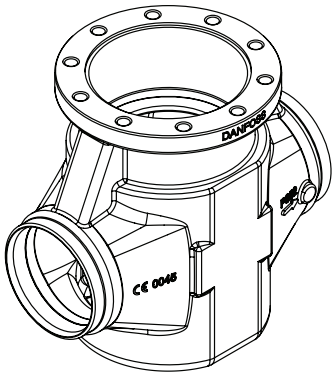
  *Opening differential pressure:*
  Fully open: Min. 0.2 bar g (min. 3 psig)
  Max. Opening Pressure Differential (MOPD), solenoid valves only - at nominal conditions.
  – 10 W a.c. up to 21 bar (305 psi)
  – 20 W a.c. up to 40 bar (580 psi)

## The ICS Concept

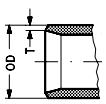
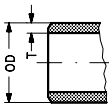
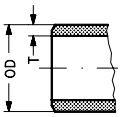
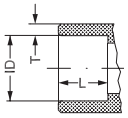
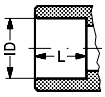
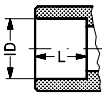
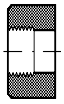
The ICS concept is developed around a modular principle. This gives the possibility of combining function modules and top covers with special valve body size that is available in a variety of connection possibilities.

- There are eight valve bodies available.

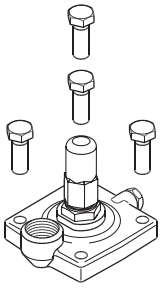
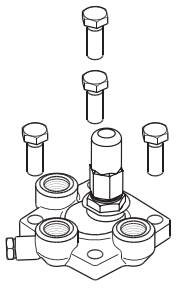
| | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| ICV 25 | ICV 32 | ICV 40 | ICV 50 | ICV 65 |

| | | |
|---|---|---|
|  |  |  |
| ICV 100 | ICV 125 | ICV 150 |

- Valve bodies in the sizes ICV 20-ICV65 are available with a range of undersizes through oversized connection sizes and types.
  ICV 100 - ICV 150 are available in butt-weld DIN and butt-weld ANSI nominal sizes

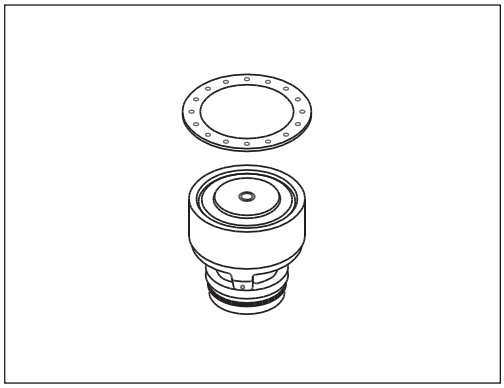
| D | A | J | SOC | SD | SA | FPT |
|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |
| Butt-weld DIN | Butt-weld ANSI | Butt-weld JIS | Socket weld ANSI | Solder DIN | Solder ANSI | Female Pipe Thread |

- Each valve body may be fitted with a 1 pilot or 3 pilot top cover.

| | |
|---|---|
|  |  |

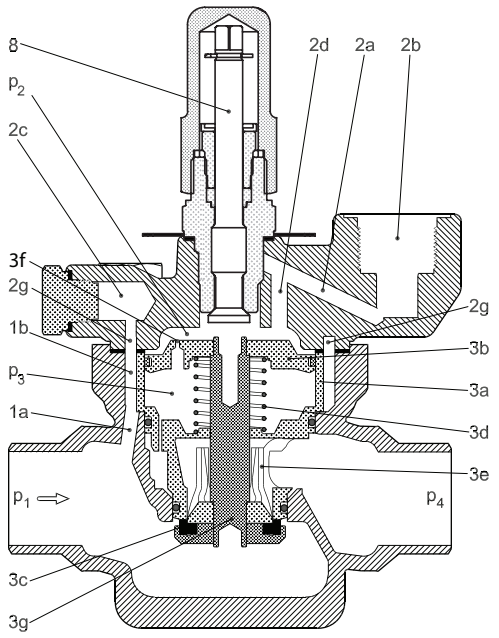
## The ICS Concept
*(continued)*

In ICS, multiple inserts (function modules) are available to give different capacities.

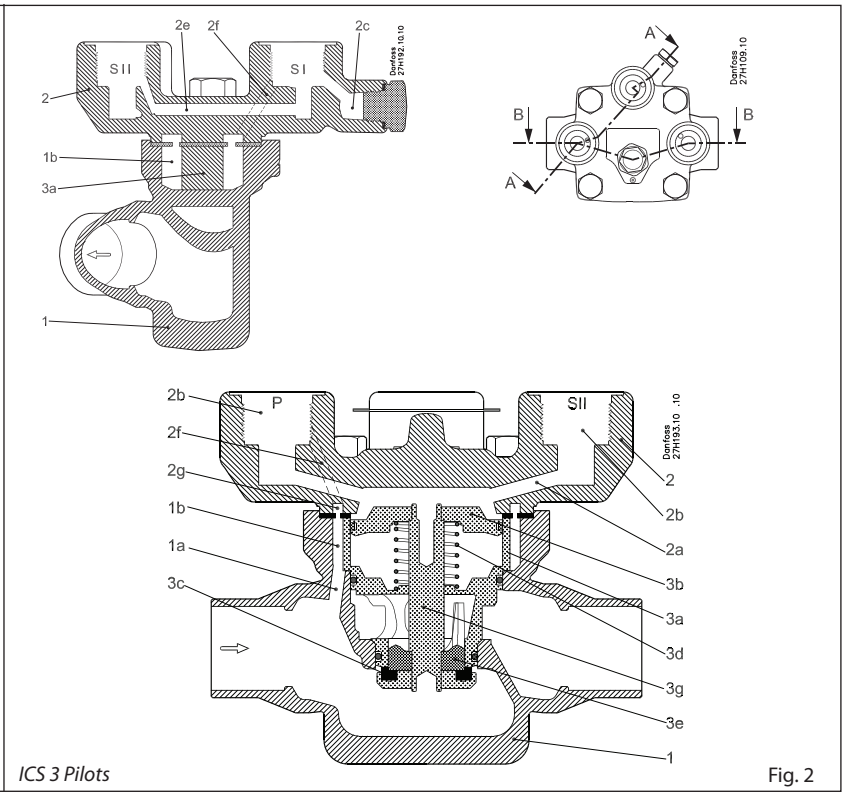


| Type | Valve body size | $K_v$ ($m^3/h$) | $C_v$ (USgal/min) |
|---|---|---|---|
| ICS 25-5 | 25 | 1.7 | 2.0 |
| ICS 25-10 | | 3.5 | 4.1 |
| ICS 25-15 | | 6.0 | 7.0 |
| ICS 25-20 | | 8 | 9.3 |
| ICS 25-25 | | 11.5 | 13.3 |
| ICS 32 | 32 | 17 | 20 |
| ICS 40 | 40 | 27 | 31 |
| ICS 50 | 50 | 44 | 51 |
| ICS 65 | 65 | 70 | 81 |
| ICS 80 | 80 | 85 | 98 |
| ICS 100 | 100 | 142 | 165 |
| ICS 125 | 125 | 207 | 240 |
| ICS 150 | 150 | 354 | 410 |

## Function




*ICS 1 Pilot* Fig. 1




*ICS 3 Pilots* Fig. 2

ICS 1 Pilot and ICS 3 Pilot

| | |
|---|---|
| 1. | Body |
| 1a | Pilot channel to inlet side |
| 1b | Circular gap between house and module |
| 2. | Top cover |
| 2a | Pilot channels in top cover |
| 2b | Pilot insertion hole |
| 2c | Pressure gauge connection |
| 2d | Piston top inlet channel |
| 2e | Cross channel SI to SII |
| 2f | Inlet channel |
| 2g | Circular groove |
| 3 | Function module |
| 3a | Cylinder |
| 3b | Piston |
| 3c | Valve plate |
| 3d | Spring |
| 3e | Cone |
| 3f | Equalisation orifice |
| 3g | Piston rod |

| | |
|---|---|
| $p_1$ | Inlet pressure |
| $p_2$ | Pressure on piston |
| $p_3$ | Pressure underneath piston |
| $p_4$ | Outlet pressure |
| 8 | Manual operating spindle |

The ICS main valve is a pilot operated valve. The types of pilot valves used determine the function. The ICS main valve with pilot valve(s) controls refrigerant flow by modulation or on/off in accordance with the pilot valve and main valve status. The manual spindle can be used to open the valve plate.

The opening degree of the main valve is determined by the pressure difference (differential pressure) between pressure $p_2$, which acts on top of the servo piston (3b), and pressure $p_3$, which acts on the underside of the servo piston.

If this pressure difference is 0, the main valve will be fully closed.
If the pressure difference is 0.2 bar (3 psi) or greater, the main valve will be fully open.
At pressure differences ($p_2$ - $p_3$) between 0.07 bar (1 psi) and 0.2 bar (3 psi), the degree of opening will be correspondingly proportional.

The port of the throttle cone (3e) is V-shaped, which provide good regulation characteristic to pilot operated main valves even at low loads.
$P_3$ pressure is equal to the valve outlet pressure ($P_4$), due to a clearance between the piston rod (3g) and the function module. The opening degree of the ICS valve is therefore controlled by the application of $P_2$ pressure acting on top of the servo piston, which is equal to or greater than valve outlet pressure ($P_4$).

$p_2 = p_4$ ~ closed
$p_2 = p_4 + 0.2$ bar (3 psi)~ fully open
$p_4 \leq p_2 \leq p_4 + 0.2$ bar (3 psi) ~ proportional degree of opening.

The maximum pressure ($p_2$) can act on the top of the servo piston (3b). $p_2$ normally corresponds to the pressure, $p_1$ - ICS main valve inlet pressure. Inlet pressure $p_1$ is led, via the drilled channels (1a, 1b, 2f, 2b (pilot), 2a, 2d) in the valve body (1) and cover (2) through the individual pilot valves and onto the top of the servo piston (3b).

The degree of opening of the individual pilot valves determines the magnitude of pressure $p_2$ and thus the degree of opening of the main valve. The equalisation hole (3f) in the servo piston (3b) ensures that pressure $p_2$ is balanced in accordance with the degree of opening of the pilot valve.

**Note:**
When ICS valves with 3 pilot ports are used with external pressure connector (fig. 2, pos. 61), the valve port inlet pressure will be isolated.

The ICS can be fitted with just a single screwed-in pilot valve or external pilot connection. The degree of opening of the main valve will be in accordance with the control status of the pilot valve or external pilot flow control.
ICS main valve with one pilot connection is fully closed when the pilot valve is fully closed and fully open when the pilot valve is fully open. Otherwise the degree of opening of the main valve is proportional to the degree of opening of the pilot valve.

The ICS 3 pilot version can be fitted with one, two, or three pilot valves so that up to three regulating functions are possible. If the external pilot connection is used, more functions can be added.

**Function** *(continued)*

In the ICS three pilot version, the pilot ports are related as follows:

- The pilot valves fitted in ports SI and SII are connected in series.
  The ICS 3 pilot operated main valve will be fully closed if just one of the series-connected pilot valves is closed. The main valve can only open if both pilot valves are open at the same time.
- The pilot valve fitted in port P is connected in parallel to the pilot valves in ports SI and SII.

The ICS valve will be fully open if the pilot valve in P is fully open, irrespective of the degree of opening of pilot valves SI and SII.
The ICS valve will be fully closed if the pilot valve in P is fully closed and at least one of the valves in SI or SII is fully closed at the same time. The relation between the pilot valves in ports SI, SII and P is shown in the table on the next page.

If the ICS is not fitted with three pilot valves, the unused port(s) must be sealed with a blanking plug. If the blanking plug is fitted as an assembled unit, A + B, the channels from the specific port will be closed. (See illustration below)

If only the top part, A, of the plug is fitted, the channels from the ports in question will be open. If the degree of opening of the ICS main valve is not to be a function of the main valve inlet pressure, or if more than three regulating functions are required, ports SI, SII or P can be fitted with a nipple for the connection of external pilot pressure. This applies to all ICS versions.

The pressure to which the external pilot line is connected will then determine pressure $p_2$ on top of the servo piston. The pilot valves fitted in that external pilot line will determine the main valve function. Pilot valves installed in external lines must be mounted in a type CVH housing.

Depending on the function of the pilot valves, the ICS regulating characteristic becomes:

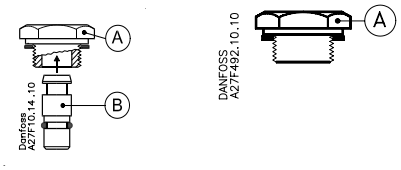
- on/off
- proportional
- integral or
- cascade.

ICS main valves are therefore especially suitable for all forms of temperature and pressure regulating systems.

An overview of the types of pilot valves available can be found in the literature "Pilot valves for operated main valves" (AI248786497190).

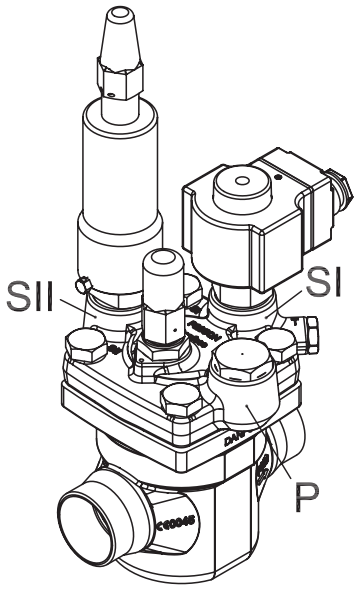
On the following pages, a number of configuration examples can be found. These are only for explanatory purpose. However, by using the literature regarding pilot valves these examples are easier to comprehend.

| Pilot valve port | | | ICS valve |
|---|---|---|---|
| SI | SII | P | |
| Open | Open | Closed | Open |
| Open | Open | Open | Open |
| Open | Closed | Closed | Closed |
| Open | Closed | Open | Open |
| Closed | Open | Closed | Closed |
| Closed | Open | Open | Open |
| Closed | Closed | Closed | Closed |
| Closed | Closed | Open | Open |

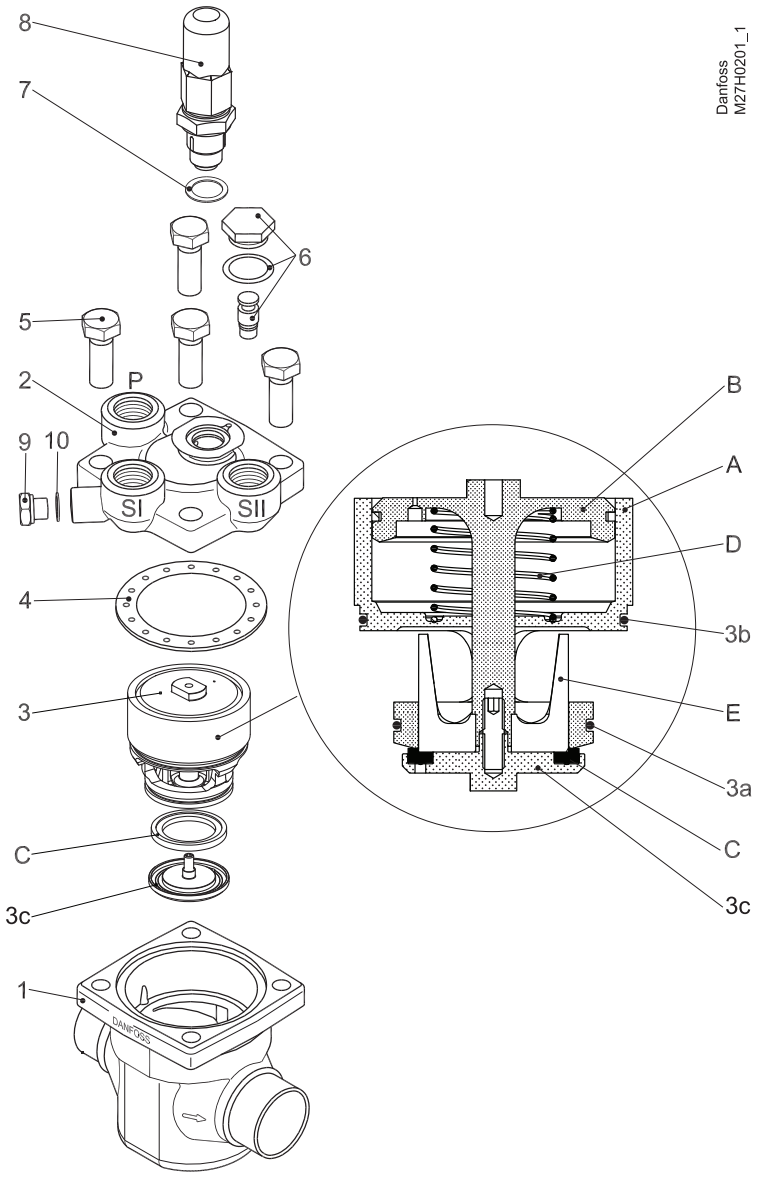



*Blanking plug A + B* *Blanking plug A*

*Example (ICS with 3 pilot valves)*



## Material specification - ICS 25, 32, 40, 50, 65

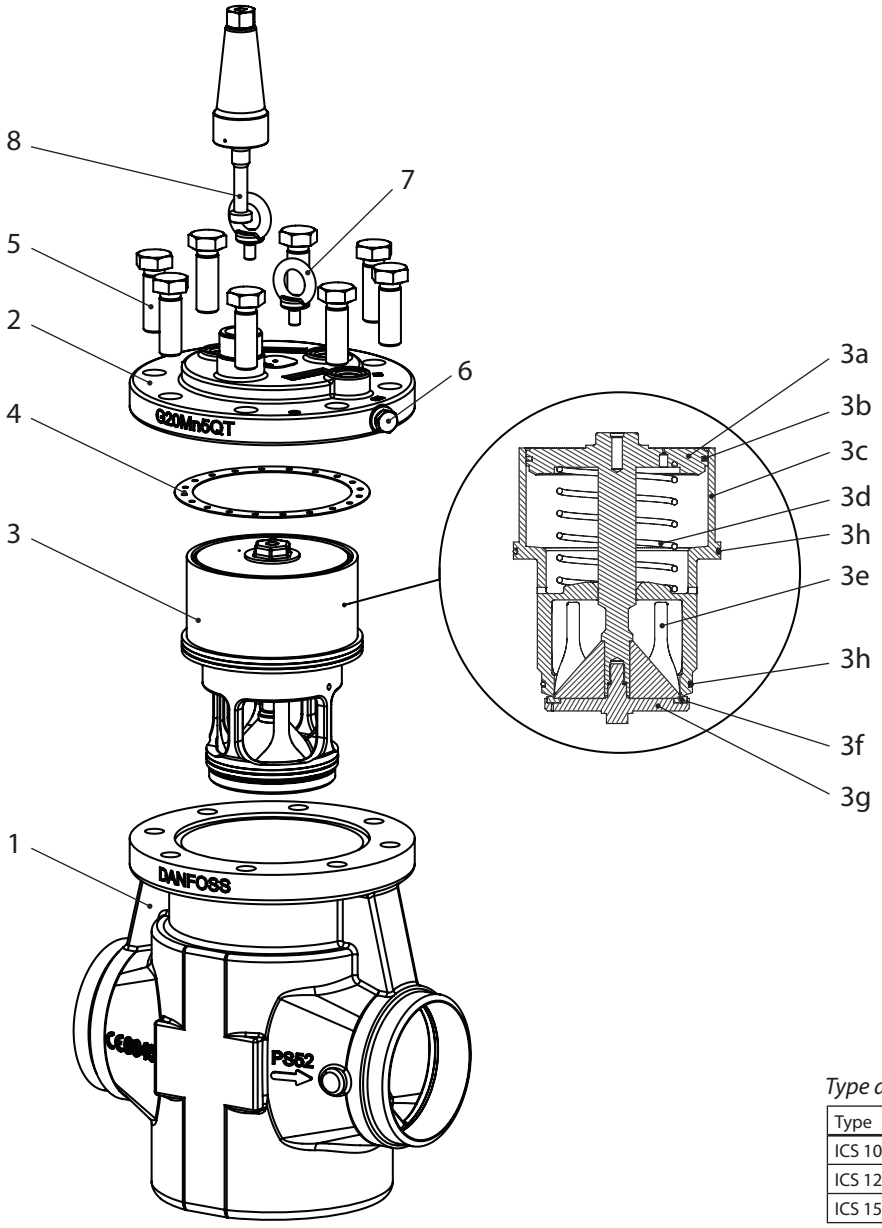



*Type and size of Bolt (pos. 5)*

| Type | Screw |
|---|---|
| ICS 25 | M12 × 30 A2-70 DIN 933 |
| ICS 32 | M14 × 35 A2-70 DIN 933 |
| ICS 40 | M14 × 40 A2-70 DIN 933 |
| ICS 50 | M16 × 40 A2-70 DIN 933 |
| ICS 65 | M16 × 50 A2-70 DIN 933 |

| No. | Part | Material | EN | ASTM | JIS |
|---|---|---|---|---|---|
| 1 | Body | Low temperature steel | G20Mn5QT, EN 10213-3 | LCC A352 | SCPL1 G5151 |
| 2 | Top cover | Low temperature steel | G20Mn5QT, EN 10213-3<br>P285QH+QT 10222-4 | LCC A352<br>LF2, A350 | SCPL1 G5151 |
| 3 | Function module (assembled) | | | | |
| 3a | o-ring | Cloroprene (Neoprene) | | | |
| 3b | o-ring | Cloroprene (Neoprene) | | | |
| 3c | Washer plate | Steel | | | |
| A | Cylinder | Steel | | | |
| B | Piston | Steel | | | |
| C | Valve plate | PTFE | | | |
| D | Spring | Steel | | | |
| E | Cone | Steel | | | |
| 4 | Gasket | Fiber, non-asbestos | | | |
| 5 | Bolts | Stainless steel | A2-70, EN 1515-1 | Grade B8 A320 | A2-70, B 1054 |
| 6 | Plug | Steel | | | |
| 7 | Gasket | Aluminium | | | |
| 8 | Manual operating spindle | Steel | | | |
| 9 | Plug | Steel | | | |
| 10 | Gasket | Aluminium | | | |

## Material specification - ICS 100, 125, 150

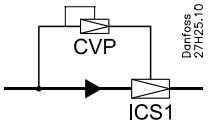
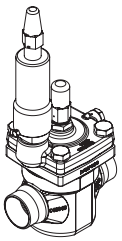
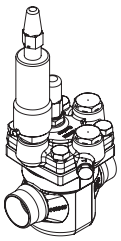


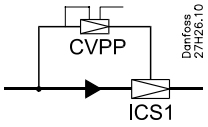
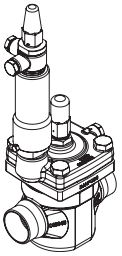
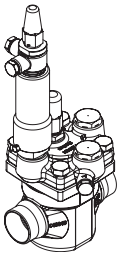

*Type and size of Bolt (pos. 5)*

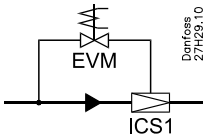
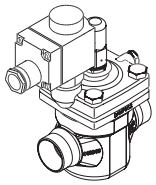
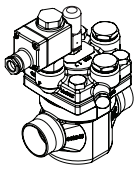
| Type | Screw |
|---|---|
| ICS 100 | M20 × 60 A2-70 DIN 933 |
| ICS 125 | M20 × 60 A2-70 DIN 933 |
| ICS 150 | M20 × 70 A2-70 DIN 933 |

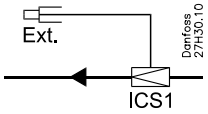
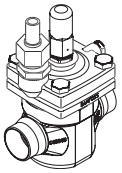
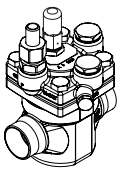
| No. | Part | Material | EN | ASTM | JIS |
|---|---|---|---|---|---|
| 1 | Body | Low temperature steel | G20Mn5QT, EN 10213-3 | LCC A352 | SCPL1 G5151 |
| 2 | Top cover | Low temperature steel | G20Mn5QT, EN 10213-3 | LCC A352 | SCPL1 G5151 |
| 3 | Function module (assembled) | | | | |
| 3a | Piston/rod | Stainless steel / steel | | | |
| 3b | Piston ring | Steel | | | |
| 3c | Insert | Steel | | | |
| 3d | Spring | Steel | | | |
| 3e | Cone | Stainless steel / steel | | | |
| 3f | Teflon plate | Teflon unfilled | | | |
| 3g | Washer plate | PTFE | | | |
| 3h | o-ring | Cloroprene (Neoprene) | | | |
| 4 | Gasket | Fiber, non-asbestos | | | |
| 5 | Bolts | Stainless steel | A2-70, EN 1515-1 | Grade B8 A320 | A2-70, B 1054 |
| 6 | Plug | Steel | | | |
| 7 | Eye bolt | Galvanized steel | | | |
| 8 | Manual operating spindle | Steel | | | |

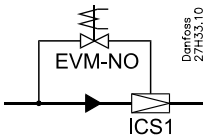
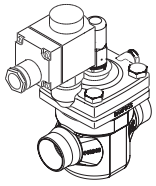
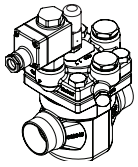
## Configuration examples

| *Example no. 1-1* | | *Products* | | *Products* | |
|---|---|---|---|---|---|
| *Constant pressure regulation*<br>• CVP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)<br>• CVP-M (4 to 28 bar g) (58 to 406 psig)<br>• CVP-H (25 to 52 bar g) (363 to 754 psig) |  | 1 × ICS 1 Pilot<br>1 × CVP-L/M/H |  | 1 × ICS 3 Pilots<br>1 × CVP-L/M/H<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

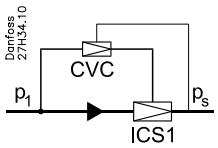
| *Example no. 1-2* | | *Products* | | *Products* | |
|---|---|---|---|---|---|
| *Differential pressure regulation*<br>• CVPP-L (0.66 to 7 bar g) (19.5 in. Hg to 102 psig)<br>• CVPP-M (4 to 28 bar g) (58 to 406 psig) |  | 1 × ICS 1 Pilot<br>1 × CVPP-L/M |  | 1 × ICS 3 Pilots<br>1 × CVPP-L/M<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

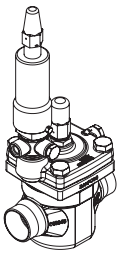
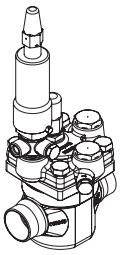
| *Example no. 1-3* | | *Products* | | *Products* | |
|---|---|---|---|---|---|
| *On/off regulation (solenoid valve)* |  | 1 × ICS 1 Pilot<br>1 × EVM<br>1 × coil |  | 1 × ICS 3 Pilots<br>1 × EVM<br>1 × coil<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

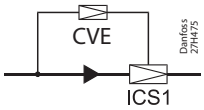
| *Example no. 1-4* | | *Products* | | *Products* | |
|---|---|---|---|---|---|
| *Regulation with external control pressure* |  | 1 × ICS 1 Pilot<br>1 × nipple for external control pressure |  | 1 × ICS 3 Pilots<br>1 × nipple for external control pressure<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

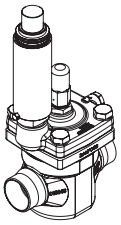
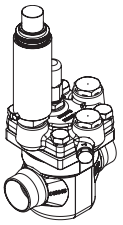
| *Example no. 1-5* | | *Products* | | *Products* | |
|---|---|---|---|---|---|
| *On/off regulation (solenoid valve)* |  | 1 × ICS 1 Pilot<br>1 × EVM-NO (12 W coil) |  | 1 × ICS 3 Pilots<br>1 × EVM-NO (12 W coil)<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

## Configuration examples *(continued)*

| *Example no. 1-6* | |
|---|---|
| *Crankcase pressure regulation. (Max. suction pressure regulation)*<br>• -0.45 to 7 bar g<br>(13.3 in. Hg to 102 psig) |  |

| *Products* | | *Products* | |
|---|---|---|---|
| 1 × ICS 1 Pilot<br>1 × CVC-L |  | 1 × ICS 3 Pilots<br>1 × CVC-L<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

| *Example no. 1-7* | |
|---|---|
| *Electronically controlled media temperature regulation*<br>• -0.66 to 8 bar g<br>(19.5 in. Hg to 116 psig) |  |

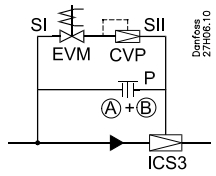
| *Products* | | *Products* | |
|---|---|---|---|
| 1 × ICS 1 Pilot<br>1 × CVE |  | 1 × ICS 3 Pilots<br>1 × CVE<br>2 × Blanking plugs<br>SI: A + B<br>SII: A |  |

## Configuration examples *(continued)*

*Example no. 2-1*

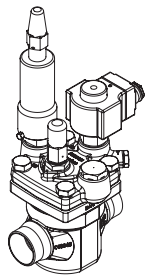
*Constant pressure regulation combined with electrical shut off*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)




*Products*

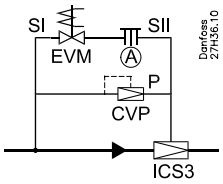
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVP-L
1 × EVM
1 × coil



*Example no. 2-2*

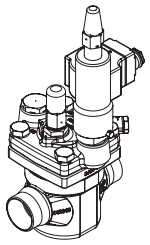
*Constant pressure regulation combined with electrical wide open*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)




*Products*

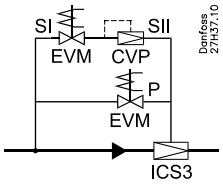
1 × ICS 3 Pilots
1 × blanking plug (A)
1 × CVP-L
1 × EVM



*Example no. 2-3*

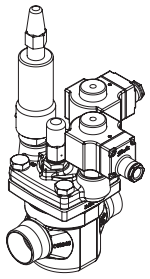
*Constant pressure regulation combined with electrical shut off and wide open*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)




*Products*

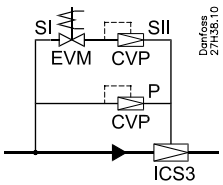
1 × ICS 3 Pilots
1 × CVP-L
2 × EVM
2 × coils



*Example no. 2-4*

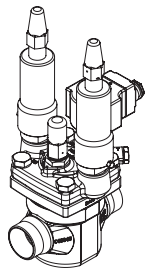
*Constant pressure regulation with change-over between two preset evaporating pressures*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)




*Products*

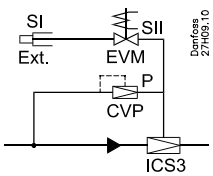
1 × ICS 3 Pilots
2 × CVP-L
1 × EVM
1 × coil



*Example no. 2-5*

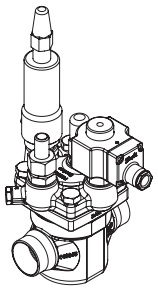
*External control pressure with electrical shut off combined with constant pressure regulation*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)




*Products*

1 × ICS 3 Pilots
1 × nipple for external control pressure
1 × CVP-L
1 × EVM
1 × coil

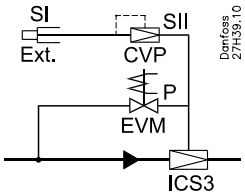


## Configuration examples *(continued)*

*Example no. 2-6*

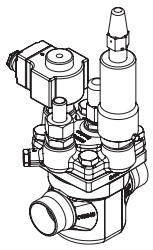
*Constant pressure regulation with external control pressure combined with electrical wide open*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)




*Products*

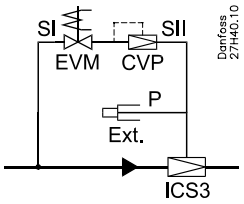
1 × ICS 3 Pilots
1 × nipple for external control pressure
1 × CVP-L
1 × EVM
1 × coil



*Example no. 2-7*

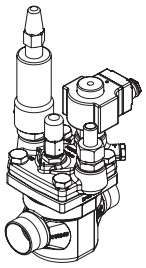
*Constant pressure regulation with electrical shut off combined with external control pressure*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig)



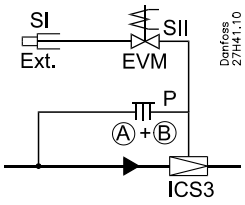

*Products*

1 × ICS 3 Pilots
1 × nipple for external control pressure
1 × CVP-L
1 × EVM
1 × coil



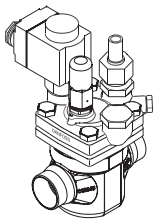
*Example no. 2-8*

*Solenoid valve with external control pressure for small pressure drops*




*Products*

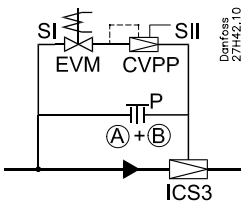
1 × ICS 3
1 × blanking plug (A + B)
1 × nipple for external control pressure
1 × EVM
1 × coil



*Example no. 2-9*

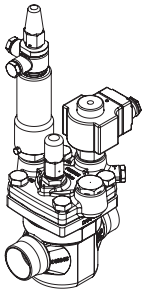
*Differential pressure regulation combined with electrical shut off*

- CVPP-L (0.66 to 7 bar g) (19.5 in. Hg to 102 psig)




*Products*

1 × ICS 3
1 × blanking plug (A + B)
1 × CVPP-L
1 × EVM
1 × coil

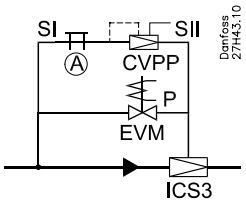


## Configuration examples *(continued)*

*Example no. 2-10*

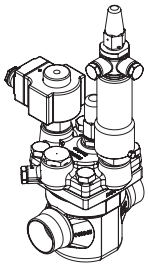
*Differential pressure regulation combined with electrical wide open*

- CVPP-L (0.66 to 7 bar g) (19.5 in. Hg to 102 psig)




*Products*

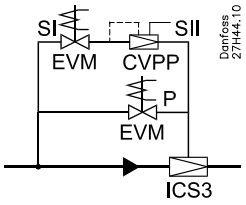
1 × ICS 3 Pilots
1 × blanking plug (A)
1 × CVPP-L
1 × EVM
1 × coil



*Example no. 2-11*

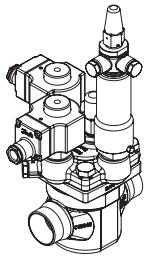
*Differential pressure regulation combined with electrical wide open and shut off*

- CVPP-L (0.66 to 7 bar g) (19.5 in. Hg to 102 psig)




*Products*

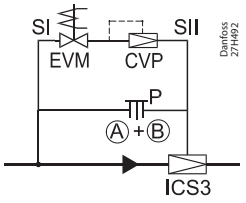
1 × ICS 3 Pilots
1 × CVPP-L
2 × EVM
2 × coils



*Example no. 2-12*

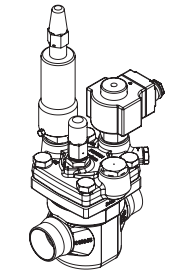
*Constant pressure regulation combined with electrical shut off*

- CVP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVP-M (4 to 28 bar g) (58 to 406 psig)
- CVP-H (25 to 52 bar g) (363 to 754 psig)




*Products*

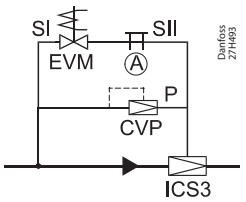
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVP-L/M/H
1 × EVM
1 × coil



*Example no. 2-13*

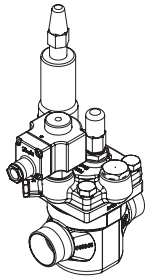
*Constant pressure regulation combined with electrical wide open*

- CVP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVP-M (4 to 28 bar g) (58 to 406 psig)
- CVP-H (25 to 52 bar g) (363 to 754 psig)




*Products*

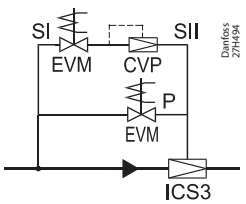
1 × ICS 3 Pilots
1 × blanking plug (A)
1 × CVP-L/M/H
1 × EVM
1 × coil



*Example no. 2-14*

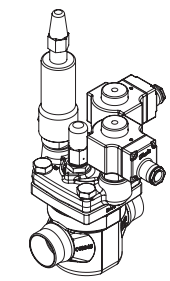
*Constant pressure regulation combined with electrical shut off and wide open*

- CVP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVP-M (4 to 28 bar g) (58 to 406 psig)
- CVP-H (25 to 52 bar g) (363 to 754 psig)




*Products*

1 × ICS 3 Pilots
1 × CVP-L/M/H
2 × EVM
2 × coils

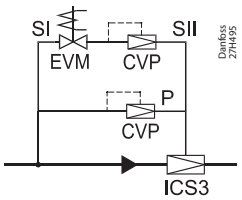


## Configuration examples *(continued)*

*Example no. 2-15*

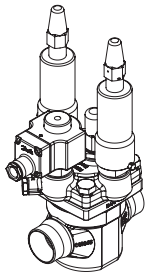
*Constant pressure regulation with change-over between two preset evaporating pressures*

- CVP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVP-M (4 to 28 bar g) (58 to 406 psig)
- CVP-H (25 to 52 bar g) (363 to 754 psig)




*Products*

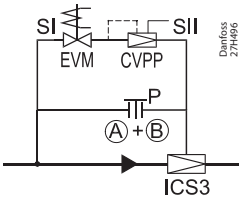
1 × ICS 3 Pilots
2 × CVP-L/M/H
1 × EVM
1 × coil



*Example no. 2-16*

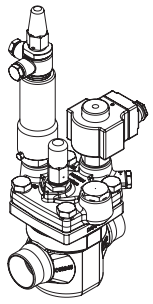
*Differential pressure regulation combined with electrical shut off*

- CVPP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVPP-M (4 to 28 bar g) (58 to 406 psig)




*Products*

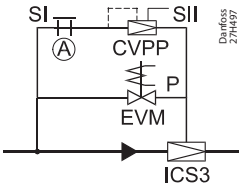
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVPP-L/M
1 × EVM
1 × coil



*Example no. 2-17*

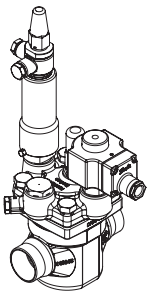
*Differential pressure regulation combined with electrical wide open*

- CVPP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVPP-M (4 to 28 bar g) (58 to 406 psig)




*Products*

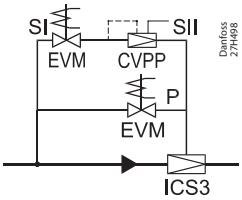
1 × ICS 3 Pilots
1 × blanking plug (A)
1 × CVPP-L/M
1 × EVM
1 × coil



*Example no. 2-18*

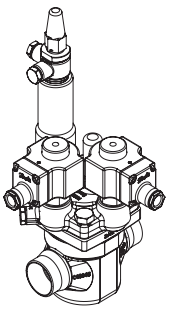
*Differential pressure regulation combined with electrical wide open and shut off*

- CVPP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVPP-M (4 to 28 bar g) (58 to 406 psig)




*Products*

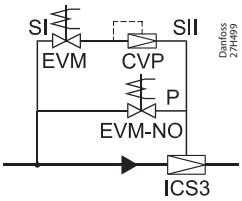
1 × ICS 3 Pilots
1 × CVPP-L/M
2 × EVM
2 × coils



*Example no. 2-19*

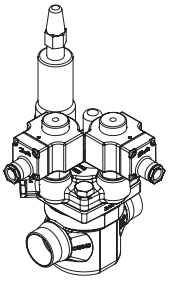
*Constant pressure regulation combined with electrical wide open and shut off*

- CVP-L (-0.66 to 7 bar g) (19.5 in. Hg to 102 psig)
- CVP-M (4 to 28 bar g) (58 to 406 psig)
- CVP-H (25 to 52 bar g) (363 to 754 psig)




*Products*

1 × ICS 3 Pilots
1 × CVP-L/M/H
1 × EVM
1 × EVM-NO (12 W coil)
2 × coils

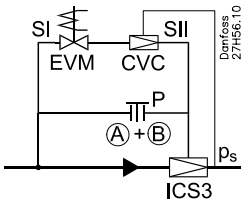


## Configuration examples *(continued)*

*Example no. 2-20*

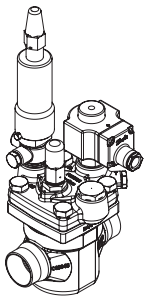
*Crankcase pressure regulation (max. suction pressure regulation) combined with shut off*

- –0.45 to 7 bar g (13.3 in. Hg to 102 psig)




*Products*

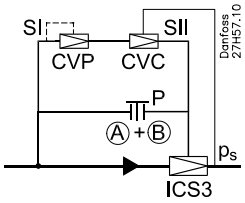
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVC-L
1 × EVM
1 × coil



*Example no. 2-21*

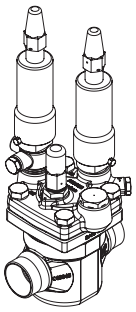
*Crankcase pressure regulation (max. suction pressure regulation) combined with evaporating pressure regulation*

- –0.66 to 28 bar g (19.5 in. Hg to 406 psig).




*Products*

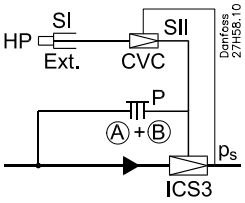
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVC-L/M
1 × CVP-L/M



*Example no. 2-22*

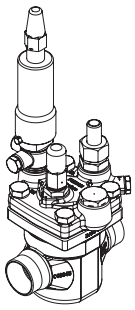
*Crankcase pressure regulation (max. suction pressure regulation) at low pressure drops across the valve*

- –0.45 to 7 bar g (13.3 in. Hg to 102 psig)




*Products*

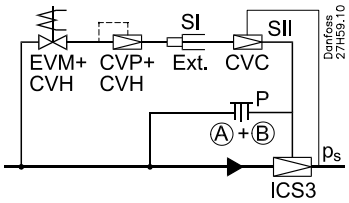
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × nipple for external control pressure
1 × CVC-L



*Example no. 2-23*

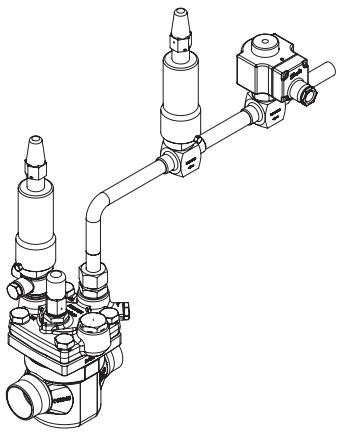
*Crankcase pressure regulation (max. suction pressure regulation) combined with constant pressure regulation and electrical shut off.*

- –0.66 to 7 bar g (19.5 in. Hg to 102 psig).




*Products*

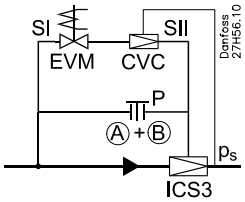
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × nipple for external control pressure
1 × CVP-L
1 × EVM
1 × coil
2 × CVH
1 × CVC-L



*Example no. 2-24*

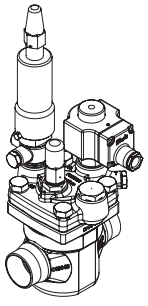
*Hot gas bypass regulation combined with electrical shut off*

- –0.45 to 7 bar g (13.3 in. Hg to 102 psig)




*Products*

1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVC-L
1 × EVM
1 × coil

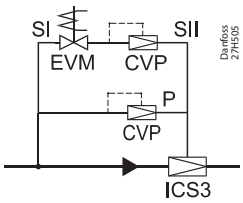


## Configuration examples *(continued)*

*Example no. 2-25*

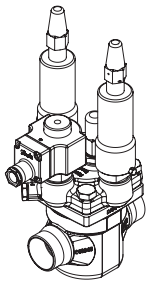
*Constant pressure regulation with electrical shut off and protection against high pressure when suction line is closed*

- –0.66 to 28 bar g (19.5 in. Hg to 406 psig).




*Products*

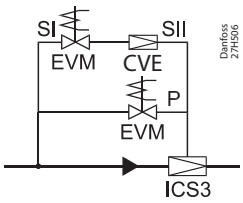
1 × ICS 3 Pilots
1 × CVP-L
1 × EVM
1 × coil
1 × CVP-M



*Example no. 2-26*

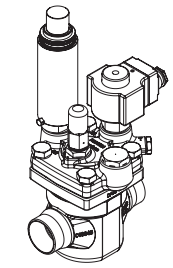
*Electronically controlled media temperature regulation combined with electrical shut off*

- –1 to 8 bar g (0 in. Hg to 116 psig).




*Products*

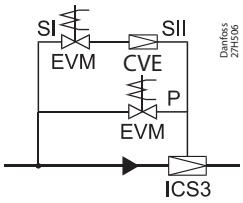
1 × ICS 3 Pilots
1 × blanking plug (A + B)
1 × CVE
1 × EVM
1 × coil



*Example no. 2-27*

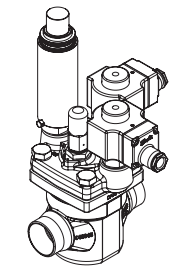
*Electronically controlled media temperature regulation combined with electrical shut off and wide open*

- –1 to 8 bar g (0 in. Hg to 116 psig).




*Products*

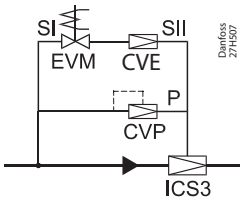
1 × ICS 3 Pilots
1 × CVE
2 × EVM
2 × coils



*Example no. 2-28*

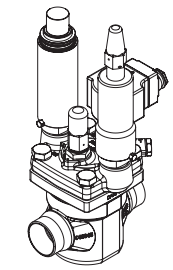
*Electronically controlled media temperature regulation combined with electrical shut off and changeover to constant pressure regulation*

- –1 to 8 bar g (0 in. Hg to 116 psig).




*Products*

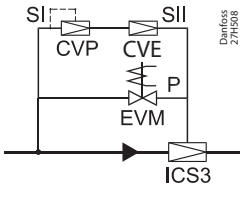
1 × ICS 3 Pilots
1 × CVQ
1 × CVP-L
1 × EVM
1 × coil



*Example no. 2-29*

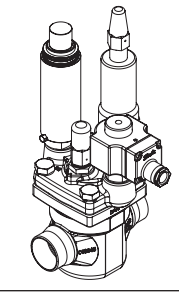
*Electronically controlled media temperature regulation with low evaporating pressure protection combined with wide open*

- –1 to 8 bar g (0 in. Hg to 116 psig).

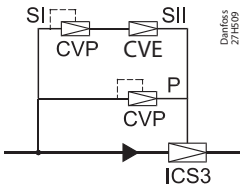


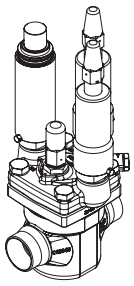

*Products*

1 × ICS 3 Pilots
1 × CVE
1 × CVP-L
1 × EVM
1 × coil



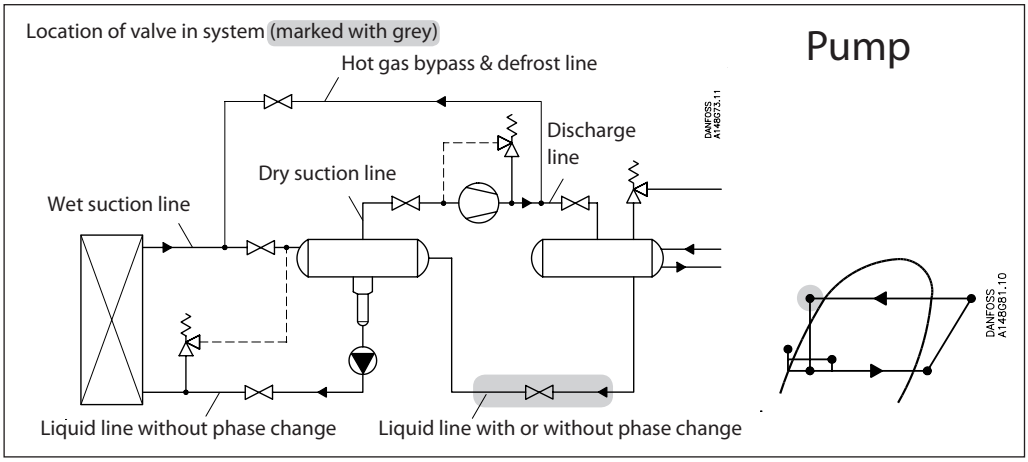
## Configuration examples *(continued)*

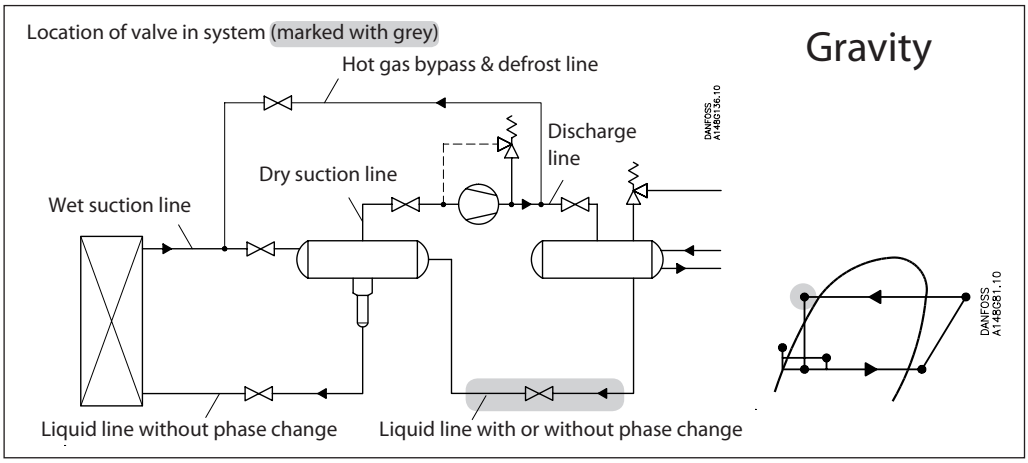
| *Example no. 2-30* | |
|---|---|
| *Electronically controlled media temperature regulation with low evaporating pressure protection combined with changeover to constant pressure regulation*<br>• –1 to 8 bar g<br>(0 in. Hg to 116 psig). |  |

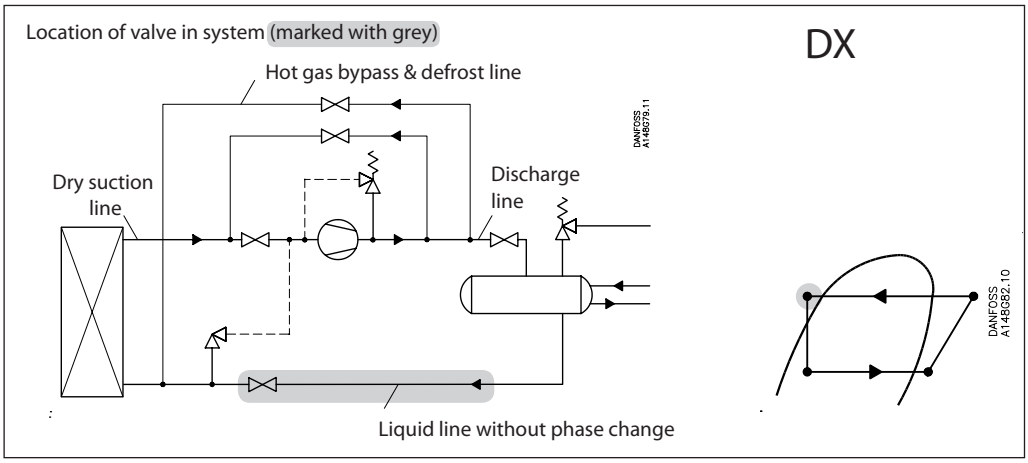
| *Products* | |
|---|---|
| 1 × ICS 3 Pilots<br>1 × CVE<br>2 × CVP-L |  |

**Nominal capacities**

# Liquid line with/without phase change



**Nominal capacities**

# Liquid line with/without phase change

## SI units

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:
- $T_e$ = –20 C
- $Q_o$ = 250 kW
- $T_{liq}$ = 10 °C
- Max. $\Delta p$ = 0.3 bar

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

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

Correction factor for $\Delta p$ 0.3 bar $f_{\Delta p} = 0.82$
Correction factor for liquid temperature $f_{Tliq} = 0.92$

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

From the capacity table a ICS 25-10 with $Q_n$ capacity 366 kW is selected.

## US units

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:
- $T_e$ = –20°F
- $Q_o$ = 130 TR
- Liquid temperature = 50°F
- Max. $\Delta p$ = 4 psi

The capacity table is based on nominal condition (pressure drop $\Delta p$ = 3 psi, $T_{liq}$ = 90°F)

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

Correction factor for $\Delta p$ 4 psi, $f_{\Delta p} = 0.87$
Correction factor for liquid temperature $f_{Tliq} = 0.92$

$Q_n = Q_o \times f_{\Delta p} \times f_{Tliq} = 130 \times 0.87 \times 0.92 = 104$ TR

From the capacity table a ICS25-15 with $Q_n$ capacity 175 TR is selected.

**Nominal capacities**

## SI units

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

## Liquid line with/without phase change

### R 717

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 |
| ICS25-5 | 25 | 1.7 | 169 | 171 | 174 | 176 | 178 | 180 | 181 |
| ICS25-10 | | 3.5 | 347 | 353 | 358 | 362 | 366 | 370 | 372 |
| ICS25-15 | | 6 | 595 | 604 | 613 | 621 | 628 | 633 | 638 |
| ICS25-20 | | 8 | 794 | 806 | 818 | 828 | 838 | 845 | 852 |
| ICS25-25 | | 11.5 | 1140 | 1158 | 1175 | 1190 | 1203 | 1216 | 1223 |
| ICS32 | 32 | 17 | 1687 | 1710 | 1738 | 1760 | 1777 | 1795 | 1810 |
| ICS40 | 40 | 27 | 2675 | 2720 | 2760 | 2795 | 2825 | 2850 | 2875 |
| ICS50 | 50 | 44 | 4365 | 4430 | 4500 | 4550 | 4600 | 4650 | 4685 |
| ICS65 | 65 | 70 | 6940 | 7050 | 7150 | 7250 | 7325 | 7400 | 7450 |
| ICS80 | 80 | 85 | 8432 | 8559 | 8690 | 8797 | 8893 | 8982 | 9046 |
| ICS100 | 100 | 142 | 14086 | 14299 | 14517 | 14696 | 14857 | 15005 | 15112 |
| ICS125 | 125 | 207 | 20533 | 20845 | 21162 | 21424 | 21658 | 21873 | 22029 |
| ICS150 | 150 | 354 | 35115 | 35647 | 36191 | 36638 | 37038 | 37406 | 37673 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| 0.2 | 1.00 |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.82 |
| –10°C | 0.86 |
| 0°C | 0.88 |
| 10°C | 0.92 |
| 20°C | 0.96 |
| 30°C | 1.00 |
| 40°C | 1.04 |
| 50°C | 1.09 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi

### R 717

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F |
| ICS25-5 | 25 | 2 | 48.0 | 48.8 | 49.6 | 50.6 | 51.0 | 51.4 | 52.0 |
| ICS25-10 | | 4.1 | 99.0 | 100 | 102 | 104 | 105 | 106 | 107 |
| ICS25-15 | | 7 | 169 | 172 | 175 | 178 | 180 | 181 | 183 |
| ICS25-20 | | 9.3 | 226 | 230 | 233 | 237 | 240 | 242 | 244 |
| ICS25-25 | | 13.3 | 324 | 330 | 335 | 341 | 345 | 348 | 351 |
| ICS32 | 32 | 20 | 480 | 488 | 496 | 503 | 509 | 514 | 518 |
| ICS40 | 40 | 31 | 762 | 775 | 788 | 799 | 808 | 816 | 822 |
| ICS50 | 50 | 51 | 1242 | 1262 | 1285 | 1302 | 1317 | 1330 | 1340 |
| ICS65 | 65 | 81 | 1975 | 2010 | 2043 | 2070 | 2095 | 2115 | 2130 |
| ICS80 | 80 | 98 | 2377 | 2416 | 2456 | 2496 | 2524 | 2546 | 2568 |
| ICS100 | 100 | 165 | 4002 | 4068 | 4135 | 4202 | 4249 | 4287 | 4324 |
| ICS125 | 125 | 240 | 5820 | 5916 | 6015 | 6113 | 6181 | 6235 | 6289 |
| ICS150 | 150 | 410 | 9943 | 10107 | 10275 | 10443 | 10559 | 10651 | 10745 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| 3 | 1.00 |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.82 |
| 10°F | 0.85 |
| 30°F | 0.88 |
| 50°F | 0.92 |
| 70°F | 0.96 |
| 90°F | 1.00 |
| 110°F | 1.04 |
| 130°F | 1.09 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW],
$T_{liq}$ = 10°C,
ΔP = 0.2 bar

## Liquid line with/without phase change

### R 744

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40 | –30 | –20 | –10 | 0 | 10 | 10 |
| ICS25-5 | 25 | 1.7 | 41.0 | 41.0 | 41.0 | 41.0 | 41.0 | 40.0 | 39.0 |
| ICS25-10 | | 3.5 | 84.0 | 85.0 | 85.0 | 85.0 | 85.0 | 83.0 | 80.0 |
| ICS25-15 | | 6 | 144 | 145 | 146 | 146 | 145 | 142 | 137 |
| ICS25-20 | | 8 | 193 | 194 | 195 | 195 | 194 | 190 | 183 |
| ICS25-25 | | 11.5 | 277 | 278 | 280 | 281 | 278 | 273 | 263 |
| ICS32 | 32 | 17 | 409 | 412 | 415 | 415 | 411 | 403 | 388 |
| ICS40 | 40 | 27 | 650 | 654 | 658 | 659 | 654 | 641 | 617 |
| ICS50 | 50 | 44 | 1058 | 1065 | 1073 | 1073 | 1065 | 1044 | 1005 |
| ICS65 | 65 | 70 | 1685 | 1695 | 1707 | 1708 | 1694 | 1661 | 1598 |
| ICS80 | 80 | 85 | 2045 | 2058 | 2068 | 2070 | 2057 | 2015 | 1943 |
| ICS100 | 100 | 142 | 3417 | 3438 | 3456 | 3458 | 3436 | 3365 | 3246 |
| ICS125 | 125 | 207 | 4981 | 5011 | 5037 | 5040 | 5009 | 4906 | 4732 |
| ICS150 | 150 | 354 | 8519 | 8570 | 8615 | 8620 | 8567 | 8390 | 8092 |

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

| ΔP (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.52 |
| –10°C | 0.67 |
| 0°C | 0.91 |
| **10°C** | **1.00** |
| 15°C | 1.09 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 50°F,
ΔP = 3 psi

### R 744

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F |
| ICS25-5 | 25 | 2 | 11.7 | 11.9 | 12.0 | 12.0 | 11.9 | 11.6 | 10.9 |
| ICS25-10 | | 4.1 | 24.2 | 24.6 | 24.8 | 24.8 | 24.5 | 23.8 | 22.4 |
| ICS25-15 | | 7 | 41.5 | 42.1 | 42.5 | 42.5 | 42.0 | 40.8 | 38.4 |
| ICS25-20 | | 9.3 | 55.3 | 56.2 | 56.7 | 56.7 | 56.0 | 54.4 | 51.0 |
| ICS25-25 | | 13.3 | 79.5 | 81.8 | 81.5 | 81.5 | 80.5 | 78.0 | 73.5 |
| ICS32 | 32 | 20 | 118 | 119 | 120 | 120 | 119 | 115 | 109 |
| ICS40 | 40 | 31 | 187 | 190 | 191 | 191 | 189 | 184 | 173 |
| ICS50 | 50 | 51 | 304 | 309 | 312 | 312 | 308 | 299 | 281 |
| ICS65 | 65 | 81 | 484 | 492 | 496 | 496 | 490 | 476 | 448 |
| ICS80 | 80 | 98 | 582 | 592 | 596 | 596 | 589 | 572 | 539 |
| ICS100 | 100 | 165 | 980 | 997 | 1004 | 1004 | 992 | 964 | 907 |
| ICS125 | 125 | 240 | 1426 | 1450 | 1460 | 1460 | 1444 | 1402 | 1319 |
| ICS150 | 150 | 410 | 2436 | 2477 | 2494 | 2494 | 2466 | 2395 | 2254 |

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

| ΔP (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.48 |
| 10°F | 0.64 |
| 30°F | 0.88 |
| **50°F** | **1.00** |

**Nominal capacities**

# Liquid line with/without phase change

## SI units

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

### R 134a

| Type | Valve body size | $K_v$ | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ($m^3/h$) | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 30.0 | 32.0 | 33.0 | 34.0 | 36.0 | 37.0 | 38.0 |
| ICS25-10 | | 3.5 | 62.0 | 65.0 | 68.0 | 71.0 | 74.0 | 77.0 | 79.0 |
| ICS25-15 | | 6 | 107 | 112 | 117 | 122 | 127 | 131 | 136 |
| ICS25-20 | | 8 | 142 | 149 | 156 | 1625 | 169 | 175 | 181 |
| ICS25-25 | | 11.5 | 205 | 214 | 224 | 233 | 243 | 251 | 260 |
| ICS32 | 32 | 17 | 303 | 317 | 331 | 345 | 358 | 372 | 384 |
| ICS40 | 40 | 27 | 481 | 503 | 526 | 548 | 569 | 590 | 610 |
| ICS50 | 50 | 44 | 783 | 820 | 857 | 893 | 928 | 962 | 994 |
| ICS65 | 65 | 70 | 1246 | 1305 | 1363 | 1420 | 1476 | 1530 | 1582 |
| ICS80 | 80 | 85 | 1511 | 1585 | 1655 | 1722 | 1795 | 1858 | 1919 |
| ICS100 | 100 | 142 | 2525 | 2648 | 2765 | 2877 | 2999 | 3104 | 3206 |
| ICS125 | 125 | 207 | 3680 | 3861 | 4030 | 4194 | 4371 | 4525 | 4674 |
| ICS150 | 150 | 354 | 6294 | 6602 | 6892 | 7173 | 7475 | 7739 | 7992 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.66 |
| –10°C | 0.70 |
| 0°C | 0.76 |
| 10°C | 0.82 |
| 20°C | 0.90 |
| **30°C** | **1.00** |
| 40°C | 1.13 |
| 50°C | 1.29 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi

### R 134a

| Type | Valve body size | $C_v$ | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | (USgal/min) | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 8.5 | 9.0 | 9.4 | 9.8 | 10.3 | 10.7 | 11.1 |
| ICS25-10 | | 4.1 | 17.5 | 18.4 | 19.4 | 20.3 | 21.2 | 22.0 | 22.8 |
| ICS25-15 | | 7 | 30.0 | 31.6 | 33.2 | 34.7 | 36.2 | 37.7 | 39.0 |
| ICS25-20 | | 9.3 | 40.0 | 42.1 | 44.3 | 46.3 | 48.4 | 50.3 | 52.0 |
| ICS25-25 | | 13.3 | 57.4 | 60.6 | 63.6 | 66.5 | 69.5 | 72.3 | 75.0 |
| ICS32 | 32 | 20 | 85 | 89 | 94 | 98.5 | 103 | 107 | 111 |
| ICS40 | 40 | 31 | 135 | 142 | 149 | 156 | 163 | 170 | 176 |
| ICS50 | 50 | 51 | 220 | 232 | 244 | 255 | 266 | 277 | 287 |
| ICS65 | 65 | 81 | 350 | 369 | 387 | 405 | 423 | 440 | 456 |
| ICS80 | 80 | 98 | 421 | 443 | 466 | 487 | 509 | 530 | 549 |
| ICS100 | 100 | 165 | 709 | 747 | 784 | 820 | 857 | 892 | 924 |
| ICS125 | 125 | 240 | 1031 | 1086 | 1141 | 1193 | 1247 | 1297 | 1344 |
| ICS150 | 150 | 410 | 1761 | 1855 | 1949 | 2038 | 2131 | 2216 | 2296 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.64 |
| 10°F | 0.68 |
| 30°F | 0.74 |
| 50°F | 0.81 |
| 70°F | 0.89 |
| **90°F** | **1.00** |
| 110°F | 1.15 |
| 130°F | 1.35 |

**Nominal capacities**

## SI units

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

### Liquid line with/without phase change

### R 404A

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 |
| ICS25-5 | 25 | 1.7 | 19.6 | 21.0 | 22.3 | 23.7 | 25.0 | 26.1 | 27.3 |
| ICS25-10 | | 3.5 | 40.3 | 43.0 | 46.0 | 49.0 | 51.3 | 54.0 | 56.0 |
| ICS25-15 | | 6 | 69.0 | 74.0 | 79.0 | 84.0 | 88.0 | 92.0 | 96.0 |
| ICS25-20 | | 8 | 92.0 | 99.0 | 105 | 111 | 117 | 123 | 128 |
| ICS25-25 | | 11.5 | 133 | 142 | 151 | 160 | 169 | 177 | 185 |
| ICS32 | 32 | 17 | 196 | 210 | 223 | 237 | 249 | 261 | 274 |
| ICS40 | 40 | 27 | 311 | 333 | 354 | 375 | 396 | 415 | 432 |
| ICS50 | 50 | 44 | 507 | 542 | 577 | 612 | 645 | 676 | 705 |
| ICS65 | 65 | 70 | 806 | 863 | 918 | 973 | 1025 | 1077 | 1120 |
| ICS80 | 80 | 85 | 979 | 1049 | 1116 | 1184 | 1246 | 1307 | 1363 |
| ICS100 | 100 | 142 | 1636 | 1752 | 1864 | 1978 | 2082 | 2183 | 2277 |
| ICS125 | 125 | 207 | 2385 | 2554 | 2717 | 2883 | 3035 | 3182 | 3319 |
| ICS150 | 150 | 354 | 4079 | 4367 | 4647 | 4931 | 5191 | 5442 | 5675 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.55 |
| –10°C | 0.60 |
| 0°C | 0.66 |
| 10°C | 0.74 |
| 20°C | 0.85 |
| **30°C** | **1.00** |
| 40°C | 1.23 |
| 50°C | 1.68 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi

### R 404A

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F |
| ICS25-5 | 25 | 2 | 5.4 | 5.8 | 6.2 | 6.6 | 7.0 | 7.4 | 7.8 |
| ICS25-10 | | 4.1 | 11.0 | 11.9 | 12.8 | 13.7 | 14.5 | 15.3 | 16.0 |
| ICS25-15 | | 7 | 18.9 | 20.4 | 22.0 | 23.4 | 24.9 | 26.2 | 27.4 |
| ICS25-20 | | 9.3 | 25.2 | 27.2 | 29.2 | 31.3 | 33.0 | 35.0 | 36.5 |
| ICS25-25 | | 13.3 | 36.1 | 39.1 | 42.0 | 45.0 | 47.6 | 50.0 | 52.5 |
| ICS32 | 32 | 20 | 53.5 | 57.8 | 62.0 | 66.4 | 70.4 | 74.0 | 77.6 |
| ICS40 | 40 | 31 | 85.0 | 92.0 | 99.0 | 106 | 112 | 118 | 123 |
| ICS50 | 50 | 51 | 138 | 150 | 161 | 172 | 182 | 192 | 201 |
| ICS65 | 65 | 81 | 220 | 238 | 256 | 274 | 290 | 306 | 320 |
| ICS80 | 80 | 98 | 265 | 287 | 308 | 329 | 348 | 367 | 385 |
| ICS100 | 100 | 165 | 446 | 483 | 518 | 554 | 587 | 619 | 648 |
| ICS125 | 125 | 240 | 649 | 702 | 754 | 806 | 853 | 900 | 942 |
| ICS150 | 150 | 410 | 1109 | 1199 | 1288 | 1377 | 1458 | 1537 | 1609 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.52 |
| 10°F | 0.57 |
| 30°F | 0.63 |
| 50°F | 0.72 |
| 70°F | 0.83 |
| **90°F** | **1.00** |
| 110°F | 1.29 |
| 130°F | 1.92 |

**Nominal capacities**

## SI units

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

## Liquid line with/without phase change

### R 22

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 |
| ICS25-5 | 25 | 1.7 | 33.7 | 34.8 | 35.8 | 36.8 | 37.8 | 38.6 | 39.4 |
| ICS25-10 | | 3.5 | 69.3 | 71.7 | 73.8 | 75.8 | 77.8 | 79.6 | 81.2 |
| ICS25-15 | | 6 | 119 | 123 | 127 | 130 | 133 | 136 | 139 |
| ICS25-20 | | 8 | 158 | 164 | 169 | 173 | 178 | 182 | 186 |
| ICS25-25 | | 11.5 | 228 | 235 | 242 | 249 | 255 | 261 | 267 |
| ICS32 | 32 | 17 | 337 | 348 | 358 | 368 | 378 | 386 | 394 |
| ICS40 | 40 | 27 | 535 | 553 | 569 | 585 | 600 | 614 | 626 |
| ICS50 | 50 | 44 | 871 | 901 | 928 | 953 | 977 | 1000 | 1021 |
| ICS65 | 65 | 70 | 1386 | 1433 | 1476 | 1516 | 1555 | 1591 | 1624 |
| ICS80 | 80 | 85 | 1684 | 1741 | 1792 | 1841 | 1888 | 1931 | 1972 |
| ICS100 | 100 | 142 | 2813 | 2908 | 2994 | 3075 | 3154 | 3226 | 3294 |
| ICS125 | 125 | 207 | 4100 | 4239 | 4365 | 4482 | 4598 | 4703 | 4802 |
| ICS150 | 150 | 354 | 7012 | 7249 | 7465 | 7665 | 7864 | 8042 | 8212 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.71 |
| –10°C | 0.75 |
| 0°C | 0.80 |
| 10°C | 0.86 |
| 20°C | 0.92 |
| **30°C** | **1.00** |
| 40°C | 1.09 |
| 50°C | 1.22 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi

### R 22

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F |
| ICS25-5 | 25 | 2 | 9.5 | 9.8 | 10.1 | 10.5 | 10.7 | 11.0 | 11.3 |
| ICS25-10 | | 4.1 | 19.5 | 20.2 | 20.9 | 21.5 | 22.1 | 22.7 | 23.2 |
| ICS25-15 | | 7 | 33.5 | 34.6 | 35.9 | 37.0 | 38.0 | 39.0 | 39.8 |
| ICS25-20 | | 9.3 | 44.5 | 46.2 | 47.8 | 49.2 | 50.6 | 52.0 | 53.0 |
| ICS25-25 | | 13.3 | 64.0 | 66.4 | 68.6 | 71.0 | 73.0 | 75.0 | 76.0 |
| ICS32 | 32 | 20 | 95.0 | 98.0 | 101 | 105 | 108 | 110 | 112 |
| ICS40 | 40 | 31 | 151 | 156 | 161 | 166 | 171 | 175 | 179 |
| ICS50 | 50 | 51 | 245 | 254 | 263 | 271 | 279 | 285 | 291 |
| ICS65 | 65 | 81 | 390 | 404 | 418 | 431 | 443 | 454 | 464 |
| ICS80 | 80 | 98 | 470 | 486 | 502 | 519 | 533 | 546 | 558 |
| ICS100 | 100 | 165 | 791 | 818 | 846 | 874 | 897 | 920 | 939 |
| ICS125 | 125 | 240 | 1150 | 1190 | 1230 | 1271 | 1305 | 1338 | 1366 |
| ICS150 | 150 | 410 | 1965 | 2033 | 2102 | 2171 | 2230 | 2286 | 2333 |

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

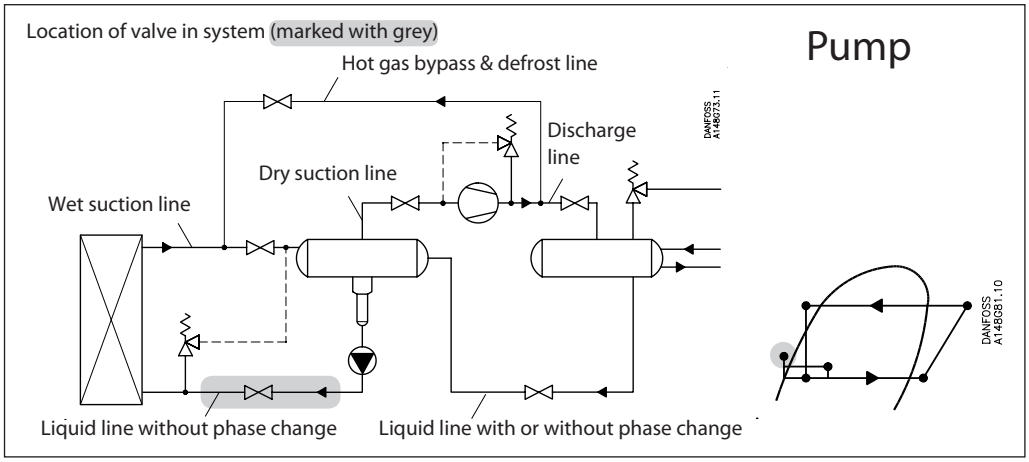
| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.73 |
| 10°F | 0.77 |
| 30°F | 0.82 |
| 50°F | 0.87 |
| 70°F | 0.93 |
| **90°F** | **1.00** |
| 110°F | 1.09 |
| 130°F | 1.20 |

**Nominal capacities**

## Liquid line without phase change




## SI units

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:

$T_e$ = –20 C
$Q_o$ = 180 kW
Circulation rate = 3
Max. $\Delta p$ = 0.3 bar

The capacity table is based on nominal condition (pressure drop $\Delta p$ = 0.2 bar, circulation rate = 4)

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

Correction factor for $\Delta p$ 0.3 bar $f_{\Delta p} = 0.82$
Correction factor for circulation rate $f_{rec} = 0.75$

$Q_n = Q_o \times f_{\Delta p} \times f_{rec} = 180 \times 0.82 \times 0.75 = 111$ kW

From the capacity table a ICS 25-10 with $Q_n$ capacity 117 kW is selected.

## US units

Calculation example (R 717 capacities):

Running conditions in a plant are as follows:

$T_e$ = –20 F
$Q_o$ = 130 TR
Circulation rate = 3
Max. $\Delta p$ = 4 psi

The capacity table is based on nominal condition (pressure drop $\Delta p$ = 3 psi, circulation rate = 4)

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

Correction factor for $\Delta p$ 4 psi, $f_{\Delta p} = 0.87$
Correction factor for circulation rate $f_{rec} = 0.75$

$Q_n = Q_o \times f_{\Delta p} \times f_{rec} = 130 \times 0.87 \times 0.75 = 85$ TR

From the capacity table a ICS 25 with $Q_n$ capacity 114 TR is selected.

**Nominal capacities**

# Liquid line without phase change

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

### R 717

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 63.0 | 61.0 | 59.0 | 56.6 | 55.0 | 52.5 | 50.3 | 48.0 |
| ICS25-10 | | 3.5 | 128 | 124 | 121 | 117 | 112 | 108 | 104 | 99.0 |
| ICS25-15 | | 6 | 219 | 213 | 207 | 200 | 193 | 185 | 178 | 169 |
| ICS25-20 | | 8 | 292 | 284 | 276 | 266 | 257 | 247 | 237 | 226 |
| ICS25-25 | | 11.5 | 419 | 408 | 396 | 383 | 369 | 355 | 340 | 325 |
| ICS32 | 32 | 17 | 620 | 603 | 585 | 566 | 546 | 525 | 503 | 480 |
| ICS40 | 40 | 27 | 985 | 959 | 930 | 900 | 868 | 833 | 798 | 761 |
| ICS50 | 50 | 44 | 1605 | 1560 | 1515 | 1465 | 1413 | 1360 | 1300 | 1242 |
| ICS65 | 65 | 70 | 2550 | 2485 | 2410 | 2330 | 2248 | 2160 | 2070 | 1976 |
| ICS80 | 80 | 85 | 3106 | 3020 | 2932 | 2832 | 2732 | 2624 | 2516 | 2400 |
| ICS100 | 100 | 142 | 5190 | 5045 | 4898 | 4730 | 4563 | 4383 | 4204 | 4009 |
| ICS125 | 125 | 207 | 7565 | 7354 | 7140 | 6896 | 6652 | 6390 | 6128 | 5844 |
| ICS150 | 150 | 354 | 12938 | 12576 | 12210 | 11793 | 11376 | 10928 | 10479 | 9994 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 717

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 18.0 | 17.4 | 16.9 | 16.2 | 15.6 | 14.9 | 14.2 | 13.4 |
| ICS25-10 | | 4.1 | 37.0 | 35.9 | 34.7 | 33.4 | 32.0 | 30.6 | 29.6 | 27.6 |
| ICS25-15 | | 7 | 63.4 | 61.5 | 59.4 | 57.3 | 55.0 | 52.5 | 50.0 | 47.3 |
| ICS25-20 | | 9.3 | 84.5 | 82.0 | 79.3 | 76.3 | 73.3 | 70.0 | 66.6 | 63.0 |
| ICS25-25 | | 13.3 | 122 | 118 | 114 | 110 | 105 | 102 | 95.7 | 91.0 |
| ICS32 | 32 | 20 | 180 | 174 | 169 | 162 | 156 | 149 | 142 | 134 |
| ICS40 | 40 | 31 | 285 | 276 | 267 | 258 | 247 | 236 | 225 | 213 |
| ICS50 | 50 | 51 | 465 | 451 | 436 | 420 | 403 | 385 | 366 | 347 |
| ICS65 | 65 | 81 | 740 | 717 | 694 | 668 | 641 | 613 | 583 | 552 |
| ICS80 | 80 | 98 | 891 | 863 | 835 | 804 | 771 | 738 | 703 | 664 |
| ICS100 | 100 | 165 | 1499 | 1453 | 1406 | 1353 | 1298 | 1243 | 1183 | 1118 |
| ICS125 | 125 | 240 | 2181 | 2113 | 2045 | 1968 | 1889 | 1808 | 1721 | 1627 |
| ICS150 | 150 | 410 | 3726 | 3609 | 3493 | 3363 | 3226 | 3088 | 2941 | 2779 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

**Nominal capacities**

# Liquid line without phase change

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

### R 744

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 19.0 | 18.0 | 16.6 | 15.2 | 13.6 | 12.0 | 9.8 | 7.1 |
| ICS25-10 | | 3.5 | 39.3 | 37.0 | 34.2 | 31.3 | 28.0 | 24.4 | 20.0 | 14.7 |
| ICS25-15 | | 6 | 68.0 | 63.0 | 59.0 | 54.0 | 48.0 | 42.0 | 36.0 | 25.0 |
| ICS25-20 | | 8 | 90.0 | 85.0 | 78.0 | 72.0 | 64.0 | 56.0 | 46.0 | 34.0 |
| ICS25-25 | | 11.5 | 129 | 121 | 112 | 103 | 92.0 | 80.0 | 66.0 | 48.0 |
| ICS32 | 32 | 17 | 191 | 179 | 166 | 152 | 136 | 118 | 98 | 72 |
| ICS40 | 40 | 27 | 303 | 285 | 264 | 241 | 216 | 188 | 155 | 113 |
| ICS50 | 50 | 44 | 494 | 464 | 430 | 393 | 352 | 306 | 252 | 185 |
| ICS65 | 65 | 70 | 787 | 738 | 685 | 626 | 560 | 487 | 401 | 294 |
| ICS80 | 80 | 85 | 955 | 897 | 831 | 761 | 680 | 593 | 490 | 357 |
| ICS100 | 100 | 142 | 1596 | 1499 | 1388 | 1271 | 1136 | 991 | 819 | 596 |
| ICS125 | 125 | 207 | 2326 | 2185 | 2023 | 1853 | 1656 | 1444 | 1194 | 869 |
| ICS150 | 150 | 354 | 3978 | 3736 | 3460 | 3170 | 2832 | 2470 | 2043 | 1486 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 744

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 5.6 | 5.8 | 4.8 | 4.3 | 3.8 | 3.2 | 2.4 | 1.4 |
| ICS25-10 | | 4.1 | 11.4 | 10.7 | 9.8 | 8.8 | 7.8 | 6.5 | 5.0 | 2.8 |
| ICS25-15 | | 7 | 19.6 | 18.3 | 16.8 | 15.2 | 13.3 | 11.2 | 8.6 | 4.8 |
| ICS25-20 | | 9.3 | 26.1 | 24.4 | 22.4 | 20.2 | 17.7 | 14.9 | 11.4 | 6.3 |
| ICS25-25 | | 13.3 | 37.6 | 35.0 | 32.2 | 29.0 | 25.5 | 21.4 | 16.4 | 9.1 |
| ICS32 | 32 | 20 | 55.5 | 51.8 | 47.6 | 43.0 | 37.7 | 31.6 | 24.2 | 13.5 |
| ICS40 | 40 | 31 | 88.0 | 82.0 | 75.5 | 68.0 | 60.0 | 50.2 | 38.5 | 21.4 |
| ICS50 | 50 | 51 | 144 | 134 | 123 | 111 | 98.0 | 82.0 | 62.7 | 35.0 |
| ICS65 | 65 | 81 | 229 | 213 | 196 | 177 | 155 | 130 | 100 | 55.4 |
| ICS80 | 80 | 98 | 275 | 260 | 236 | 213 | 187 | 157 | 120 | 67 |
| ICS100 | 100 | 165 | 463 | 438 | 397 | 358 | 315 | 264 | 202 | 113 |
| ICS125 | 125 | 240 | 674 | 637 | 578 | 521 | 458 | 384 | 294 | 164 |
| ICS150 | 150 | 410 | 1152 | 1087 | 987 | 889 | 783 | 656 | 502 | 281 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

**Nominal capacities**

# Liquid line without phase change

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

### R 134a

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 14.0 | 13.5 | 13.0 | 12.4 | 11.9 | 11.2 | 10.6 |
| ICS25-10 | | 3.5 | 28.9 | 27.8 | 26.8 | 25.6 | 24.4 | 23.2 | 21.8 |
| ICS25-15 | | 6 | 49.5 | 47.7 | 45.9 | 43.9 | 41.8 | 39.7 | 37.4 |
| ICS25-20 | | 8 | 65.9 | 63.5 | 61.1 | 58.5 | 55.8 | 52.9 | 49.8 |
| ICS25-25 | | 11.5 | 94.8 | 91.3 | 87.9 | 84.1 | 80.2 | 76.1 | 71.6 |
| ICS32 | 32 | 17 | 140 | 135 | 130 | 124 | 119 | 112 | 106 |
| ICS40 | 40 | 27 | 223 | 214 | 206 | 197 | 188 | 179 | 168 |
| ICS50 | 50 | 44 | 363 | 349 | 336 | 322 | 307 | 291 | 274 |
| ICS65 | 65 | 70 | 577 | 556 | 535 | 512 | 488 | 463 | 436 |
| ICS80 | 80 | 85 | 701 | 675 | 650 | 621 | 593 | 562 | 529 |
| ICS100 | 100 | 142 | 1171 | 1127 | 1085 | 1038 | 991 | 939 | 885 |
| ICS125 | 125 | 207 | 1707 | 1643 | 1582 | 1513 | 1444 | 1369 | 1289 |
| ICS150 | 150 | 354 | 2919 | 2810 | 2706 | 2587 | 2470 | 2341 | 2205 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 134a

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 4.1 | 4.0 | 3.8 | 3.6 | 3.4 | 3.2 | 3.0 |
| ICS25-10 | | 4.1 | 8.5 | 8.1 | 7.7 | 7.4 | 7.0 | 6.6 | 6.1 |
| ICS25-15 | | 7 | 14.4 | 13.8 | 13.2 | 12.6 | 11.9 | 11.2 | 10.4 |
| ICS25-20 | | 9.3 | 19.2 | 18.4 | 17.6 | 16.7 | 15.8 | 14.9 | 13.8 |
| ICS25-25 | | 13.3 | 27.4 | 26.3 | 25.1 | 23.9 | 22.7 | 21.3 | 19.8 |
| ICS32 | 32 | 20 | 41.2 | 39.5 | 37.8 | 35.9 | 34.1 | 32.0 | 29.8 |
| ICS40 | 40 | 31 | 63.9 | 61.2 | 58.6 | 55.7 | 52.8 | 49.6 | 46.1 |
| ICS50 | 50 | 51 | 105 | 101 | 96.3 | 91.6 | 86.9 | 81.5 | 75.9 |
| ICS65 | 65 | 81 | 167 | 160 | 153 | 146 | 138 | 130 | 121 |
| ICS80 | 80 | 98 | 202 | 194 | 185 | 176 | 167 | 157 | 146 |
| ICS100 | 100 | 165 | 340 | 326 | 312 | 297 | 281 | 264 | 246 |
| ICS125 | 125 | 240 | 495 | 475 | 453 | 432 | 409 | 384 | 357 |
| ICS150 | 150 | 410 | 845 | 811 | 774 | 737 | 698 | 657 | 611 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

## Liquid line without phase change

### R 404A

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 12.4 | 12.0 | 11.3 | 10.7 | 10.0 | 9.5 | 9.0 | 8.1 |
| ICS25-10 | | 3.5 | 25.4 | 24.4 | 23.2 | 22.0 | 21.0 | 19.7 | 18.2 | 17.0 |
| ICS25-15 | | 6 | 44.0 | 42.0 | 40.0 | 38.0 | 36.0 | 34.0 | 31.0 | 29.0 |
| ICS25-20 | | 8 | 58.0 | 56.0 | 53.0 | 51.0 | 48.0 | 45.0 | 42.0 | 38.0 |
| ICS25-25 | | 11.5 | 84.0 | 80.0 | 76.0 | 73.0 | 69.0 | 65.0 | 60.0 | 55.0 |
| ICS32 | 32 | 17 | 124 | 119 | 113 | 107 | 102 | 95.0 | 89.0 | 81.0 |
| ICS40 | 40 | 27 | 196 | 189 | 179 | 170 | 161 | 151 | 141 | 129 |
| ICS50 | 50 | 44 | 320 | 307 | 291 | 277 | 263 | 247 | 229 | 210 |
| ICS65 | 65 | 70 | 509 | 488 | 463 | 441 | 418 | 393 | 365 | 334 |
| ICS80 | 80 | 85 | 619 | 594 | 564 | 537 | 508 | 478 | 444 | 407 |
| ICS100 | 100 | 142 | 1034 | 993 | 942 | 897 | 849 | 798 | 742 | 680 |
| ICS125 | 125 | 207 | 1507 | 1448 | 1373 | 1307 | 1237 | 1163 | 1081 | 991 |
| ICS150 | 150 | 354 | 2578 | 2475 | 2347 | 2235 | 2116 | 1989 | 1849 | 1694 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 404A

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 3.6 | 3.5 | 3.2 | 3.0 | 2.9 | 2.7 | 2.4 | 2.2 |
| ICS25-10 | | 4.1 | 7.4 | 7.0 | 6.7 | 6.3 | 5.9 | 5.5 | 5.0 | 4.5 |
| ICS25-15 | | 7 | 12.5 | 12.1 | 11.4 | 10.8 | 10.1 | 9.4 | 8.6 | 7.7 |
| ICS25-20 | | 9.3 | 16.9 | 16.1 | 15.2 | 14.4 | 13.5 | 12.6 | 11.5 | 10.3 |
| ICS25-25 | | 13.3 | 24.2 | 23.2 | 21.9 | 20.7 | 19.4 | 18.0 | 16.5 | 14.7 |
| ICS32 | 32 | 20 | 35.8 | 34.2 | 32.3 | 30.6 | 28.8 | 26.7 | 24.4 | 21.8 |
| ICS40 | 40 | 31 | 57.0 | 54.4 | 51.3 | 48.6 | 45.6 | 42.5 | 38.8 | 34.6 |
| ICS50 | 50 | 51 | 93.0 | 88.6 | 84.0 | 79.0 | 74.4 | 69.0 | 63.0 | 56.5 |
| ICS65 | 65 | 81 | 147 | 141 | 133 | 126 | 118 | 110 | 101 | 90.0 |
| ICS80 | 80 | 98 | 177 | 170 | 160 | 151 | 142 | 132 | 121 | 108 |
| ICS100 | 100 | 165 | 299 | 286 | 270 | 255 | 240 | 223 | 203 | 182 |
| ICS125 | 125 | 240 | 435 | 416 | 392 | 370 | 348 | 324 | 295 | 265 |
| ICS150 | 150 | 410 | 742 | 711 | 670 | 633 | 595 | 554 | 505 | 453 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

**Nominal capacities**

# Liquid line without phase change

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

### R 22

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 15.1 | 14.6 | 14.1 | 13.5 | 12.9 | 12.3 | 11.6 | 10.9 |
| ICS25-10 | | 3.5 | 31.2 | 30.1 | 29.0 | 27.9 | 26.6 | 25.3 | 24.0 | 22.5 |
| ICS25-15 | | 6 | 53.4 | 51.6 | 49.7 | 47.7 | 45.6 | 43.4 | 41.1 | 38.6 |
| ICS25-20 | | 8 | 71.2 | 68.8 | 66.3 | 63.7 | 60.8 | 57.8 | 54.7 | 51.4 |
| ICS25-25 | | 11.5 | 102 | 98.9 | 95.3 | 91.5 | 87.4 | 83.1 | 78.7 | 73.9 |
| ICS32 | 32 | 17 | 151 | 146 | 141 | 135 | 129 | 123 | 116 | 109 |
| ICS40 | 40 | 27 | 240 | 232 | 224 | 215 | 205 | 195 | 185 | 174 |
| ICS50 | 50 | 44 | 392 | 378 | 365 | 350 | 334 | 318 | 301 | 283 |
| ICS65 | 65 | 70 | 623 | 602 | 580 | 557 | 532 | 506 | 479 | 450 |
| ICS80 | 80 | 85 | 756 | 731 | 705 | 676 | 646 | 614 | 582 | 546 |
| ICS100 | 100 | 142 | 1263 | 1221 | 1177 | 1130 | 1079 | 1027 | 971 | 913 |
| ICS125 | 125 | 207 | 1841 | 1779 | 1716 | 1647 | 1572 | 1496 | 1416 | 1330 |
| ICS150 | 150 | 354 | 3148 | 3043 | 2935 | 2816 | 2689 | 2559 | 2422 | 2275 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 22

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 4.4 | 4.2 | 4.1 | 3.9 | 3.7 | 3.5 | 3.2 | 3.0 |
| ICS25-10 | | 4.1 | 9.0 | 8.7 | 8.3 | 8.0 | 7.6 | 7.1 | 6.7 | 6.2 |
| ICS25-15 | | 7 | 15.5 | 14.9 | 14.3 | 13.6 | 13.0 | 12.2 | 11.5 | 10.6 |
| ICS25-20 | | 9.3 | 20.6 | 19.9 | 19.1 | 18.2 | 17.3 | 16.3 | 15.3 | 14.2 |
| ICS25-25 | | 13.3 | 29.7 | 28.6 | 27.4 | 26.2 | 24.9 | 23.5 | 22.0 | 20.4 |
| ICS32 | 32 | 20 | 44.0 | 42.2 | 40.5 | 38.7 | 36.8 | 34.6 | 32.5 | 30.2 |
| ICS40 | 40 | 31 | 70.0 | 67.0 | 64.3 | 61.4 | 58.3 | 55.0 | 51.6 | 47.8 |
| ICS50 | 50 | 51 | 114 | 109 | 105 | 100 | 95.0 | 90.0 | 84.0 | 78.0 |
| ICS65 | 65 | 81 | 181 | 174 | 167 | 159 | 151 | 143 | 134 | 124 |
| ICS80 | 80 | 98 | 218 | 209 | 201 | 192 | 182 | 172 | 161 | 149 |
| ICS100 | 100 | 165 | 366 | 352 | 338 | 323 | 307 | 289 | 271 | 251 |
| ICS125 | 125 | 240 | 533 | 512 | 492 | 470 | 446 | 421 | 394 | 365 |
| ICS150 | 150 | 410 | 910 | 875 | 841 | 802 | 763 | 719 | 673 | 624 |

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

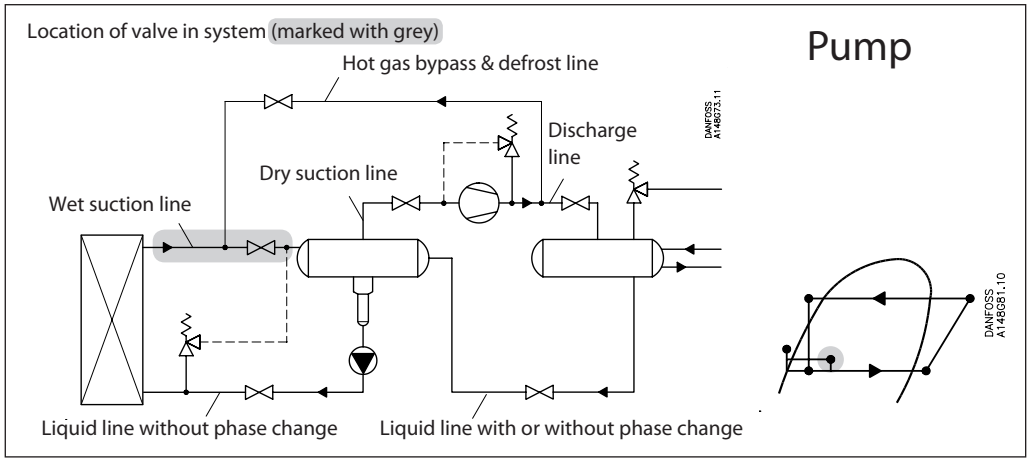
| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

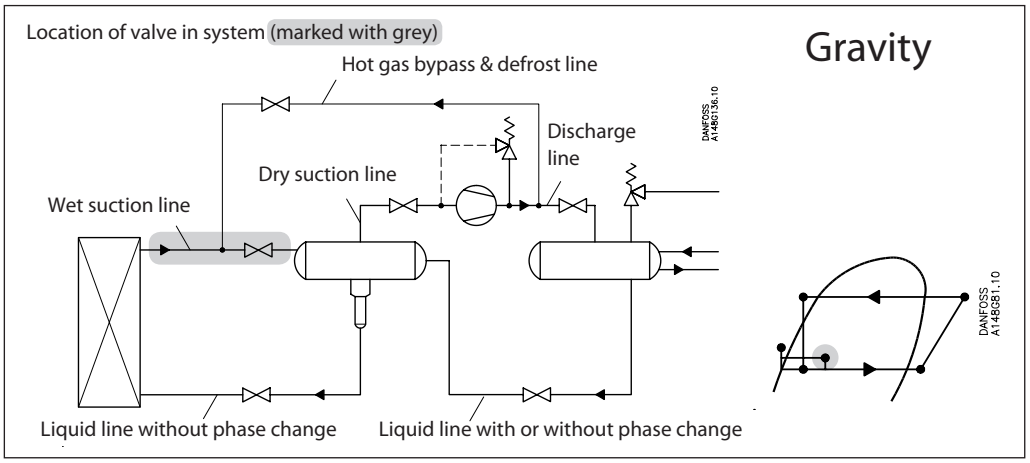
Correction factor for circulation rate ($f_{rec}$)

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.5 |
| 3 | 0.75 |
| **4** | **1** |
| 6 | 1.5 |
| 8 | 2 |
| 10 | 2.5 |

**Nominal capacities**

## Wet suction line



**Nominal capacities**

## Wet suction line

## SI units

Calculation example (R 717 capacities):

An application has following running conditions:

$T_e$ = –20 C
$Q_o$ = 80 kW
Circulation rate = 3
Max. Δp = 0.3 bar

The capacity table is based on nominal condition (pressure drop Δp = 0.2 bar, circulation rate = 4)

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

Correction factor for Δp 0.3 bar $f_{\Delta p}$ = 0.82
Correction factor for circulation rate $f_{rec}$ = 0.9

$Q_n = Q_o \times f_{\Delta p} \times f_{rec} = 80 \times 0.82 \times 0.9 = 59$ kW

From the capacity table a ICS 32 with $Q_n$ capacity 60 kW is selected.

## US units

Calculation example (R 717 capacities):

An application has following running conditions:

$T_e$ = –20 F
$Q_o$ = 8 TR
Circulation rate = 3
Max. Δp = 4 psi

The capacity table is based on nominal condition (pressure drop Δp = 3 psi, circulation rate = 4)

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

Correction factor for Δp 4 psi, $f_{\Delta p}$ = 0.87
Correction factor for circulation rate $f_{rec}$ = 0.9

$Q_n = Q_o \times f_{\Delta p} \times f_{rec} = 8 \times 0.87 \times 0.9 = 6.3$ TR

From the capacity table a ICS 25-20 with $Q_n$ capacity 6.8 TR is selected.

**Nominal capacities**

# Wet suction line

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

### R 717

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 2.4 | 3.7 | 4.9 | 6.0 | 7.2 | 8.5 | 9.7 | 11.0 |
| ICS25-10 | | 3.5 | 5.0 | 7.6 | 9.9 | 12.4 | 15.0 | 17.4 | 20.0 | 23.0 |
| ICS25-15 | | 6 | 8.6 | 13.0 | 17.0 | 21.0 | 25.5 | 30.0 | 34.0 | 39.0 |
| ICS25-20 | | 8 | 11.4 | 17.3 | 23.0 | 28.0 | 34.0 | 40.0 | 46.0 | 52.0 |
| ICS25-25 | | 11.5 | 18.5 | 25.0 | 33.0 | 41.0 | 49.0 | 57.0 | 66.0 | 75.0 |
| ICS32 | 32 | 17 | 24.4 | 37.0 | 48.0 | 60.0 | 72.0 | 85.0 | 97.0 | 110.0 |
| ICS40 | 40 | 27 | 38.7 | 58.0 | 77.0 | 95.0 | 115 | 134 | 154 | 176 |
| ICS50 | 50 | 44 | 63.1 | 95 | 125 | 155 | 186 | 219 | 252 | 286 |
| ICS65 | 65 | 70 | 100 | 152 | 200 | 247 | 297 | 348 | 401 | 455 |
| ICS80 | 80 | 85 | 123 | 184 | 242 | 300 | 361 | 423 | 486 | 553 |
| ICS100 | 100 | 142 | 206 | 308 | 405 | 501 | 603 | 707 | 812 | 924 |
| ICS125 | 125 | 207 | 300 | 449 | 590 | 730 | 880 | 1031 | 1183 | 1347 |
| ICS150 | 150 | 354 | 513 | 767 | 1009 | 1248 | 1504 | 1764 | 2023 | 2303 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 717

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.6 | 1.1 | 1.4 | 1.8 | 2.2 | 2.6 | 3.0 | 3.5 |
| ICS25-10 | | 4.1 | 1.3 | 2.2 | 3.0 | 3.7 | 4.5 | 5.4 | 6.2 | 7.1 |
| ICS25-15 | | 7 | 2.3 | 3.7 | 5.1 | 6.4 | 7.8 | 9.2 | 10.7 | 12.2 |
| ICS25-20 | | 9.3 | 3.0 | 5.0 | 6.8 | 8.5 | 10.3 | 12.3 | 14.2 | 16.2 |
| ICS25-25 | | 13.3 | 4.4 | 7.1 | 9.7 | 12.2 | 14.9 | 17.6 | 20.4 | 23.3 |
| ICS32 | 32 | 20 | 6.5 | 10.5 | 14.3 | 18.1 | 22.0 | 26.0 | 30.0 | 34.5 |
| ICS40 | 40 | 31 | 10.3 | 16.8 | 22.8 | 28.8 | 35.0 | 41.4 | 48.0 | 55.0 |
| ICS50 | 50 | 51 | 16.8 | 27.3 | 37.0 | 47.0 | 57.0 | 67.0 | 78.0 | 89.0 |
| ICS65 | 65 | 81 | 26.8 | 43.5 | 59.0 | 75.0 | 91.0 | 107 | 124 | 142 |
| ICS80 | 80 | 98 | 32 | 53 | 71 | 90 | 109 | 129 | 149 | 171 |
| ICS100 | 100 | 165 | 53 | 88 | 120 | 151 | 184 | 217 | 251 | 288 |
| ICS125 | 125 | 240 | 78 | 129 | 174 | 219 | 267 | 316 | 366 | 419 |
| ICS150 | 150 | 410 | 133 | 220 | 297 | 375 | 456 | 540 | 625 | 716 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

## Wet suction line

### R 744

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 5.2 | 6.0 | 6.7 | 7.4 | 8.0 | 8.3 | 8.4 | 7.7 |
| ICS25-10 | | 3.5 | 10.7 | 12.2 | 13.8 | 15.0 | 16.3 | 17.0 | 17.2 | 16.0 |
| ICS25-15 | | 6 | 18.3 | 21.0 | 23.6 | 26.0 | 28.0 | 29.2 | 29.5 | 27.3 |
| ICS25-20 | | 8 | 24.4 | 28.0 | 31.5 | 35.0 | 37.0 | 39.0 | 39.3 | 36.5 |
| ICS25-25 | | 11.5 | 35.0 | 40.0 | 45.0 | 50.0 | 54.0 | 56.0 | 56.5 | 52.0 |
| ICS32 | 32 | 17 | 52.0 | 59.0 | 67.0 | 74.0 | 79.0 | 83.0 | 84.0 | 77.0 |
| ICS40 | 40 | 27 | 82.0 | 94.0 | 106 | 117 | 126 | 132 | 133 | 123 |
| ICS50 | 50 | 44 | 134 | 154 | 173 | 190 | 205 | 215 | 216 | 200 |
| ICS65 | 65 | 70 | 213 | 244 | 275 | 303 | 326 | 342 | 344 | 318 |
| ICS80 | 80 | 85 | 259 | 297 | 334 | 369 | 396 | 415 | 418 | 386 |
| ICS100 | 100 | 142 | 433 | 496 | 558 | 616 | 662 | 693 | 699 | 645 |
| ICS125 | 125 | 207 | 631 | 723 | 814 | 898 | 966 | 1010 | 1019 | 941 |
| ICS150 | 150 | 354 | 1079 | 1236 | 1392 | 1535 | 1651 | 1726 | 1742 | 1609 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 744

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 1.5 | 1.7 | 2.0 | 2.2 | 2.3 | 2.4 | 2.4 | 1.8 |
| ICS25-10 | | 4.1 | 3.0 | 3.5 | 4.0 | 4.5 | 4.8 | 5.0 | 4.8 | 3.7 |
| ICS25-15 | | 7 | 5.2 | 6.0 | 6.9 | 7.7 | 8.2 | 8.6 | 8.3 | 6.4 |
| ICS25-20 | | 9.3 | 6.9 | 8.1 | 9.2 | 10.2 | 11.0 | 11.4 | 11.1 | 8.5 |
| ICS25-25 | | 13.3 | 10.0 | 11.6 | 13.2 | 14.7 | 15.8 | 16.4 | 15.9 | 12.3 |
| ICS32 | 32 | 20 | 14.7 | 17.2 | 19.4 | 21.7 | 23.3 | 24.2 | 23.5 | 18.2 |
| ICS40 | 40 | 31 | 23.3 | 27.3 | 31.0 | 34.5 | 37.0 | 38.5 | 37.3 | 28.8 |
| ICS50 | 50 | 51 | 38.0 | 44.5 | 50.5 | 56.0 | 60.5 | 62.7 | 60.8 | 47.0 |
| ICS65 | 65 | 81 | 60.5 | 71.0 | 80.0 | 89.0 | 96.0 | 100 | 96.7 | 75.0 |
| ICS80 | 80 | 98 | 73 | 85 | 97 | 108 | 115 | 120 | 117 | 90 |
| ICS100 | 100 | 165 | 123 | 143 | 163 | 181 | 194 | 202 | 196 | 151 |
| ICS125 | 125 | 240 | 179 | 208 | 237 | 264 | 282 | 294 | 286 | 220 |
| ICS150 | 150 | 410 | 305 | 355 | 405 | 451 | 483 | 502 | 488 | 375 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

## Wet suction line

### R 134a

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 1.1 | 1.6 | 1.9 | 2.3 | 2.7 | 3.1 | 3.4 |
| ICS25-10 | | 3.5 | 2.3 | 3.2 | 4.0 | 4.8 | 5.6 | 6.4 | 7.1 |
| ICS25-15 | | 6 | 4.0 | 5.5 | 6.8 | 8.2 | 9.5 | 10.9 | 12.2 |
| ICS25-20 | | 8 | 5.4 | 7.3 | 9.1 | 10.9 | 12.7 | 14.5 | 16.2 |
| ICS25-25 | | 11.5 | 7.7 | 10.5 | 13.1 | 15.7 | 18.2 | 20.9 | 23.3 |
| ICS32 | 32 | 17 | 11.4 | 15.5 | 19.4 | 23.2 | 27.0 | 30.8 | 34.5 |
| ICS40 | 40 | 27 | 18.1 | 24.6 | 30.8 | 36.8 | 42.8 | 49.0 | 54.8 |
| ICS50 | 50 | 44 | 29.5 | 40.2 | 50.2 | 60.0 | 69.8 | 79.8 | 89.3 |
| ICS65 | 65 | 70 | 47.0 | 63.9 | 79.9 | 95.5 | 111 | 127 | 142 |
| ICS80 | 80 | 85 | 57 | 78 | 97 | 116 | 135 | 154 | 172 |
| ICS100 | 100 | 142 | 95 | 130 | 161 | 194 | 225 | 258 | 288 |
| ICS125 | 125 | 207 | 138 | 190 | 235 | 282 | 329 | 376 | 419 |
| ICS150 | 150 | 354 | 236 | 324 | 403 | 483 | 562 | 643 | 717 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 134a

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.3 | 0.5 | 0.6 | 0.7 | 0.8 | 1.0 | 1.1 |
| ICS25-10 | | 4.1 | 0.6 | 1.0 | 1.2 | 1.5 | 1.7 | 2.0 | 2.2 |
| ICS25-15 | | 7 | 1.0 | 1.6 | 2.1 | 2.5 | 2.9 | 3.4 | 3.8 |
| ICS25-20 | | 9.3 | 1.4 | 2.2 | 2.8 | 3.3 | 3.9 | 4.5 | 5.1 |
| ICS25-25 | | 13.3 | 2.0 | 3.1 | 3.9 | 4.8 | 5.6 | 6.4 | 7.2 |
| ICS32 | 32 | 20 | 3.0 | 4.7 | 5.9 | 7.2 | 8.4 | 9.7 | 10.9 |
| ICS40 | 40 | 31 | 4.6 | 7.2 | 9.2 | 11.1 | 13.1 | 15.0 | 16.8 |
| ICS50 | 50 | 51 | 7.6 | 11.9 | 15.1 | 18.3 | 21.5 | 24.6 | 27.7 |
| ICS65 | 65 | 81 | 12.1 | 18.9 | 24.1 | 29.1 | 34.1 | 39.1 | 44.0 |
| ICS80 | 80 | 98 | 15 | 23 | 29 | 35 | 41 | 48 | 53 |
| ICS100 | 100 | 165 | 25 | 39 | 49 | 59 | 69 | 80 | 90 |
| ICS125 | 125 | 240 | 36 | 57 | 71 | 86 | 100 | 117 | 130 |
| ICS150 | 150 | 410 | 61 | 97 | 122 | 147 | 171 | 199 | 223 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, ΔP = 0.2 bar

## Wet suction line

### R 404A

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 1.5 | 1.9 | 2.2 | 2.6 | 3.0 | 3.3 | 3.7 | 4.0 |
| ICS25-10 | | 3.5 | 3.0 | 3.8 | 4.5 | 5.3 | 6.1 | 6.9 | 7.6 | 8.2 |
| ICS25-15 | | 6 | 5.2 | 6.5 | 7.8 | 9.1 | 10.4 | 11.7 | 13.0 | 14.0 |
| ICS25-20 | | 8 | 6.9 | 8.7 | 10.4 | 12.2 | 14.0 | 15.7 | 17.3 | 18.8 |
| ICS25-25 | | 11.5 | 10.0 | 12.5 | 15.0 | 17.5 | 20.0 | 22.6 | 25.0 | 27.0 |
| ICS32 | 32 | 17 | 14.7 | 18.5 | 22.0 | 26.0 | 29.7 | 33.2 | 37.0 | 40.0 |
| ICS40 | 40 | 27 | 23.3 | 29.3 | 35.0 | 41.0 | 47.0 | 53.0 | 59.0 | 63.0 |
| ICS50 | 50 | 44 | 38.0 | 48.0 | 57.0 | 67.0 | 77.0 | 86.0 | 95.0 | 103 |
| ICS65 | 65 | 70 | 60.0 | 76.0 | 91.0 | 106 | 122 | 137 | 152 | 164 |
| ICS80 | 80 | 85 | 74 | 93 | 110 | 129 | 148 | 166 | 185 | 199 |
| ICS100 | 100 | 142 | 123 | 155 | 184 | 216 | 248 | 278 | 308 | 333 |
| ICS125 | 125 | 207 | 179 | 226 | 268 | 315 | 361 | 405 | 449 | 485 |
| ICS150 | 150 | 354 | 306 | 386 | 459 | 539 | 618 | 693 | 769 | 830 |

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

| ΔP (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, ΔP = 3 psi

### R 404A

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.4 | 0.5 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 |
| ICS25-10 | | 4.1 | 0.8 | 1.1 | 1.3 | 1.6 | 1.8 | 2.1 | 2.3 | 2.3 |
| ICS25-15 | | 7 | 1.4 | 1.9 | 2.3 | 2.7 | 3.2 | 3.6 | 3.9 | 2.5 |
| ICS25-20 | | 9.3 | 1.9 | 2.5 | 3.1 | 3.6 | 4.2 | 4.8 | 5.3 | 5.7 |
| ICS25-25 | | 13.3 | 2.8 | 3.6 | 4.4 | 5.2 | 6.0 | 6.8 | 7.5 | 8.1 |
| ICS32 | 32 | 20 | 4.1 | 5.3 | 6.5 | 7.7 | 8.9 | 10.1 | 11.1 | 12.0 |
| ICS40 | 40 | 31 | 6.5 | 8.5 | 10.3 | 12.2 | 14.2 | 16.0 | 17.7 | 19.1 |
| ICS50 | 50 | 51 | 10.6 | 13.8 | 16.8 | 19.9 | 23.0 | 26.0 | 29.0 | 31.0 |
| ICS65 | 65 | 81 | 16.9 | 22.0 | 26.7 | 31.7 | 36.7 | 41.5 | 46.0 | 49.5 |
| ICS80 | 80 | 98 | 20 | 26 | 32 | 38 | 44 | 50 | 55 | 56 |
| ICS100 | 100 | 165 | 34 | 44 | 55 | 64 | 74 | 84 | 93 | 95 |
| ICS125 | 125 | 240 | 49 | 64 | 79 | 94 | 108 | 123 | 135 | 138 |
| ICS150 | 150 | 410 | 84 | 110 | 136 | 160 | 185 | 209 | 231 | 236 |

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

| ΔP (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW], circulation rate = 4, $\Delta P$ = 0.2 bar

## Wet suction line

### R 22

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 1.4 | 1.8 | 2.2 | 2.6 | 3.0 | 3.4 | 3.8 | 4.2 |
| ICS25-10 | | 3.5 | 2.8 | 3.7 | 4.6 | 5.4 | 6.2 | 7.0 | 7.9 | 8.7 |
| ICS25-15 | | 6 | 4.8 | 6.3 | 7.8 | 9.2 | 10.6 | 12.0 | 13.5 | 14.8 |
| ICS25-20 | | 8 | 6.4 | 8.4 | 10.4 | 12.2 | 14.2 | 16.0 | 17.9 | 19.8 |
| ICS25-25 | | 11.5 | 9.2 | 12.0 | 15.0 | 17.6 | 20.4 | 23.0 | 25.8 | 28.4 |
| ICS32 | 32 | 17 | 13.6 | 17.8 | 22.1 | 26.0 | 30.1 | 34.0 | 38.1 | 42.0 |
| ICS40 | 40 | 27 | 21.5 | 28.3 | 35.1 | 41.3 | 47.8 | 54.0 | 60.6 | 66.7 |
| ICS50 | 50 | 44 | 35.1 | 46.1 | 57.2 | 67.3 | 77.9 | 88.0 | 98.7 | 109 |
| ICS65 | 65 | 70 | 55.8 | 73.3 | 91.0 | 107 | 124 | 140 | 157 | 173 |
| ICS80 | 80 | 85 | 68 | 89 | 111 | 130 | 150 | 170 | 191 | 210 |
| ICS100 | 100 | 142 | 114 | 149 | 185 | 217 | 251 | 284 | 319 | 351 |
| ICS125 | 125 | 207 | 166 | 217 | 269 | 317 | 366 | 414 | 464 | 512 |
| ICS150 | 150 | 354 | 284 | 372 | 461 | 542 | 627 | 708 | 794 | 875 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration], circulation rate = 4, $\Delta P$ = 3 psi

### R 22

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.2 | 0.5 | 0.7 | 0.8 | 0.9 | 1.1 | 1.2 | 1.3 |
| ICS25-10 | | 4.1 | 0.5 | 1.1 | 1.3 | 1.6 | 1.9 | 2.2 | 2.4 | 2.7 |
| ICS25-15 | | 7 | 0.8 | 1.8 | 2.3 | 2.8 | 3.2 | 3.7 | 4.1 | 4.6 |
| ICS25-20 | | 9.3 | 1.1 | 2.4 | 3.0 | 3.7 | 4.3 | 4.9 | 5.5 | 6.1 |
| ICS25-25 | | 13.3 | 1.6 | 3.5 | 4.4 | 5.2 | 6.1 | 7.0 | 7.9 | 8.7 |
| ICS32 | 32 | 20 | 2.4 | 5.2 | 6.5 | 7.9 | 9.2 | 10.5 | 11.9 | 13.1 |
| ICS40 | 40 | 31 | 3.7 | 8.1 | 10.1 | 12.2 | 14.3 | 16.3 | 18.4 | 20.3 |
| ICS50 | 50 | 51 | 6.1 | 13.3 | 16.7 | 20.1 | 23.5 | 26.9 | 30.2 | 33.4 |
| ICS65 | 65 | 81 | 9.69 | 21.1 | 26.5 | 31.9 | 37.3 | 42.7 | 48.0 | 53.0 |
| ICS80 | 80 | 98 | 11 | 25 | 32 | 39 | 45 | 52 | 58 | 64 |
| ICS100 | 100 | 165 | 19 | 43 | 54 | 65 | 76 | 88 | 98 | 108 |
| ICS125 | 125 | 240 | 28 | 62 | 79 | 95 | 110 | 127 | 142 | 157 |
| ICS150 | 150 | 410 | 48 | 107 | 135 | 162 | 188 | 217 | 243 | 269 |

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

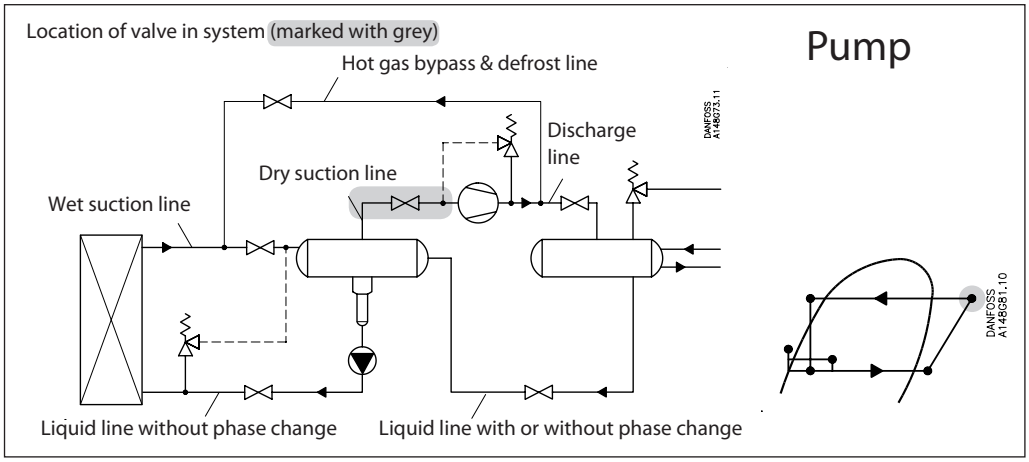
| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

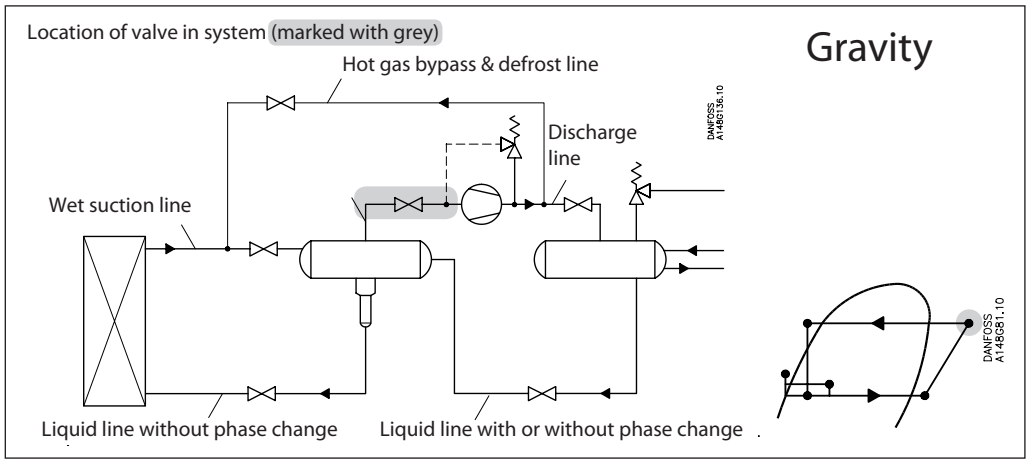
Correction factor for circulation rate ($f_{rec}$)

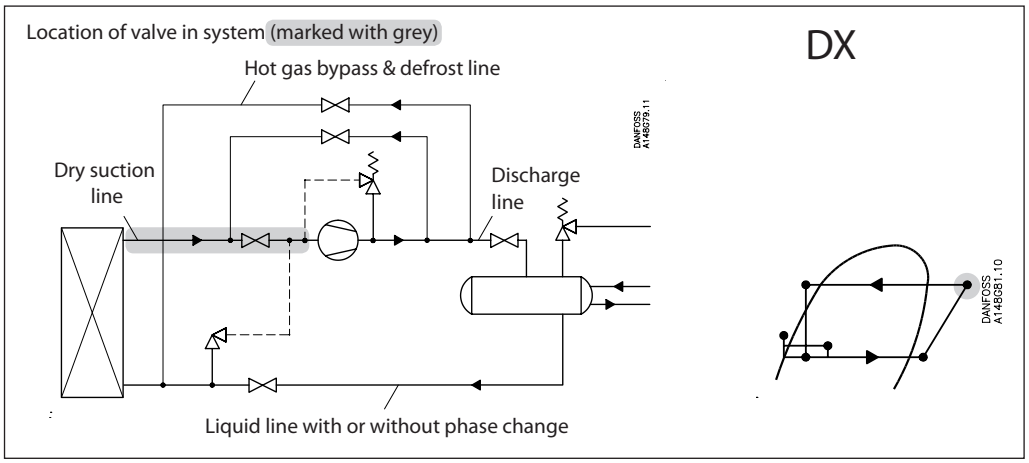
| Circulation rate | Correction factor |
|---|---|
| 2 | 0.77 |
| 3 | 0.90 |
| **4** | **1** |
| 6 | 1.13 |
| 8 | 1.20 |
| 10 | 1.25 |

**Nominal capacities**

# Dry suction line



**Nominal capacities**

## Dry suction line

### SI units

Calculation example (R 717 capacities):

An application has following running conditions:

$T_e$ = –20 °C
$Q_o$ = 90 kW
$T_{liq}$ = 10°C
Max. Δp = 0.3 bar

The capacity table is based on nominal condition (pressure drop Δp = 0.2 bar, $T_{liq}$ = 30°C)

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

Correction factor for Δp 0.3 bar $f_{\Delta p}$ = 0.82
Correction factor for liquid temperature $f_{Tliq}$ = 0.92
$Q_n = Q_o \times f\,\Delta p \times f_{Tliq} = 90 \times 0.82 \times 0.92 = 67.9$ kW
From the capacity table a ICS 32 with $Q_n$ capacity 92 kW is selected.

### US units

Calculation example (R 717 capacities):

An application has following running conditions:

$T_e$ = 0°F
$Q_o$ = 20 TR
$T_{liq}$ = 50°F
Max. Δp = 4 psi

The capacity table is based on nominal condition (pressure drop Δp = 3 psi, $T_{liq}$ = 90°F)

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

Correction factor for Δp 4 psi, $T_{liq}$ = 0.87
Correction factor for liquid temperature $f_{Tliq}$ = 0.92

$Q_n = Q_o \times f_{\Delta p} \times f_{Tliq} = 20 \times 0.87 \times 0.92 = 16$ TR

From the capacity table a ICS 25-25 with $Q_n$ capacity 18.7 TR is selected.

**Nominal capacities**

## SI units

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

### R 717

Dry suction line

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 4.4 | 5.7 | 7.3 | 9.2 | 11.4 | 14.0 | 16.5 | 19.6 |
| ICS25-10 | | 3.5 | 9.0 | 11.7 | 15.0 | 19.0 | 23.5 | 28.5 | 34.0 | 40.0 |
| ICS25-15 | | 6 | 15.5 | 20.0 | 26.0 | 32.5 | 40.0 | 49.0 | 59.0 | 69.0 |
| ICS25-20 | | 8 | 20.6 | 27.0 | 34.0 | 43.3 | 54.0 | 65.0 | 78.0 | 92.0 |
| ICS25-25 | | 11.5 | 29.7 | 38.0 | 49.0 | 63.0 | 77.0 | 94 | 112 | 132 |
| ICS32 | 32 | 17 | 44.0 | 57.0 | 73.0 | 92.0 | 114 | 139 | 166 | 196 |
| ICS40 | 40 | 27 | 70.0 | 90.0 | 116 | 146 | 181 | 220 | 263 | 311 |
| ICS50 | 50 | 44 | 113 | 147 | 189 | 239 | 295 | 359 | 429 | 507 |
| ICS65 | 65 | 70 | 181 | 234 | 301 | 380 | 470 | 570 | 682 | 807 |
| ICS80 | 80 | 85 | 219 | 284 | 365 | 461 | 570 | 694 | 829 | 978 |
| ICS100 | 100 | 142 | 367 | 475 | 609 | 770 | 952 | 1159 | 1384 | 1634 |
| ICS125 | 125 | 207 | 534 | 692 | 888 | 1123 | 1388 | 1690 | 2018 | 2381 |
| ICS150 | 150 | 354 | 914 | 1183 | 1519 | 1921 | 2374 | 2890 | 3451 | 4072 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.82 |
| –10°C | 0.86 |
| 0°C | 0.88 |
| 10°C | 0.92 |
| 20°C | 0.96 |
| **30°C** | **1.00** |
| 40°C | 1.04 |
| 50°C | 1.09 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi
Superheating = 12°F

### R 717

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 1.3 | 1.6 | 2.2 | 2.8 | 3.5 | 4.3 | 5.2 | 6.2 |
| ICS25-10 | | 4.1 | 2.5 | 3.4 | 4.4 | 5.7 | 7.2 | 8.9 | 10.7 | 12.8 |
| ICS25-15 | | 7 | 4.2 | 5.7 | 7.6 | 9.8 | 12.3 | 15.2 | 18.4 | 22.0 |
| ICS25-20 | | 9.3 | 5.6 | 7.6 | 10.1 | 13.0 | 16.4 | 20.2 | 24.5 | 29.3 |
| ICS25-25 | | 13.3 | 8.1 | 11.0 | 14.5 | 18.7 | 23.6 | 29.0 | 35.3 | 42.0 |
| ICS32 | 32 | 20 | 12.0 | 16.2 | 21.5 | 27.7 | 35.0 | 43.0 | 52.0 | 62.0 |
| ICS40 | 40 | 31 | 19.0 | 25.8 | 34.2 | 44.0 | 55.5 | 68.0 | 83.0 | 99.0 |
| ICS50 | 50 | 51 | 30.9 | 42.0 | 55.7 | 72.0 | 90.0 | 111 | 135 | 161 |
| ICS65 | 65 | 81 | 48.2 | 67.0 | 89.0 | 114 | 144 | 177 | 215 | 256 |
| ICS80 | 80 | 98 | 60 | 80 | 107 | 137 | 173 | 213 | 258 | 308 |
| ICS100 | 100 | 165 | 101 | 135 | 180 | 231 | 291 | 358 | 435 | 519 |
| ICS125 | 125 | 240 | 146 | 197 | 261 | 336 | 424 | 521 | 632 | 754 |
| ICS150 | 150 | 410 | 250 | 336 | 447 | 575 | 724 | 891 | 1080 | 1288 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for superheat ($T_S$)

| $T_s$ | Correction factor |
|---|---|
| 10°F | 1.00 |
| 14°F | 1.00 |
| 18°F | 1.00 |
| 20°F | 1.00 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.82 |
| 10°F | 0.85 |
| 30°F | 0.88 |
| 50°F | 0.92 |
| 70°F | 0.96 |
| **90°F** | **1.00** |
| 110°F | 1.04 |
| 130°F | 1.09 |

## Nominal capacities

# Dry suction line

## SI units

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

### R 744

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 6.0 | 7.3 | 8.8 | 10.4 | 12.0 | 14.0 | 15.8 | 17.7 |
| ICS25-10 | | 3.5 | 12.3 | 15.0 | 18.0 | 21.5 | 25.0 | 28.6 | 32.5 | 36.5 |
| ICS25-15 | | 6 | 21.0 | 26.0 | 31.0 | 37.0 | 43.0 | 49.0 | 56.0 | 63.0 |
| ICS25-20 | | 8 | 28.0 | 34.0 | 41.0 | 49.0 | 57.0 | 67.0 | 75.0 | 84.0 |
| ICS25-25 | | 11.5 | 40.0 | 49.0 | 59.0 | 70.0 | 82.0 | 94.0 | 107 | 120 |
| ICS32 | 32 | 17 | 60.0 | 73.0 | 88.0 | 104 | 121 | 139 | 158 | 177 |
| ICS40 | 40 | 27 | 95.0 | 116 | 139 | 165 | 192 | 221 | 251 | 281 |
| ICS50 | 50 | 44 | 154 | 189 | 227 | 268 | 313 | 360 | 409 | 459 |
| ICS65 | 65 | 70 | 245 | 300 | 361 | 427 | 498 | 573 | 650 | 730 |
| ICS80 | 80 | 85 | 298 | 365 | 438 | 520 | 605 | 697 | 791 | 887 |
| ICS100 | 100 | 142 | 498 | 609 | 732 | 869 | 1011 | 1165 | 1322 | 1482 |
| ICS125 | 125 | 207 | 726 | 888 | 1067 | 1266 | 1474 | 1699 | 1927 | 2161 |
| ICS150 | 150 | 354 | 1242 | 1518 | 1824 | 2166 | 2520 | 2905 | 3295 | 3696 |

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

| ΔP (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.52 |
| –10°C | 0.67 |
| 0°C | 0.91 |
| **10°C** | **1.00** |
| 15°C | 1.09 |

## US units

Capacity table at nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 50°F,
$\Delta p$ = 3 psi
Superheating = 12°F

### R 744

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 1.7 | 2.1 | 2.6 | 3.1 | 3.7 | 4.2 | 4.9 | 5.4 |
| ICS25-10 | | 4.1 | 3.4 | 4.3 | 5.3 | 6.4 | 7.5 | 8.7 | 10.0 | 11.2 |
| ICS25-15 | | 7 | 5.9 | 7.4 | 9.1 | 10.9 | 12.9 | 15.0 | 17.0 | 19.2 |
| ICS25-20 | | 9.3 | 7.9 | 9.9 | 12.1 | 14.5 | 17.2 | 20.0 | 22.8 | 25.5 |
| ICS25-25 | | 13.3 | 11.3 | 14.2 | 17.4 | 21.0 | 24.7 | 28.6 | 32.8 | 36.7 |
| ICS32 | 32 | 20 | 16.7 | 21.0 | 25.7 | 31.0 | 36.5 | 42.4 | 48.5 | 54.3 |
| ICS40 | 40 | 31 | 26.6 | 33.3 | 41.0 | 49.0 | 58.0 | 67.0 | 77.0 | 86.0 |
| ICS50 | 50 | 51 | 43.3 | 54.3 | 66.5 | 80.0 | 94.0 | 110 | 125 | 141 |
| ICS65 | 65 | 81 | 69.0 | 86.5 | 106 | 127 | 150 | 174 | 199 | 223 |
| ICS80 | 80 | 98 | 83 | 104 | 128 | 153 | 181 | 210 | 240 | 269 |
| ICS100 | 100 | 165 | 140 | 175 | 215 | 258 | 305 | 353 | 404 | 453 |
| ICS125 | 125 | 240 | 203 | 255 | 313 | 375 | 443 | 513 | 588 | 658 |
| ICS150 | 150 | 410 | 347 | 435 | 534 | 641 | 757 | 877 | 1005 | 1124 |

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

| ΔP (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for superheat ($T_S$)

| $T_s$ | Correction factor |
|---|---|
| 10°F | 1.00 |
| 14°F | 1.00 |
| 18°F | 1.00 |
| 20°F | 1.00 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.48 |
| 10°F | 0.64 |
| 30°F | 0.88 |
| **50°F** | **1.00** |

**Nominal capacities**

## SI units

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

## Dry suction line

### R 134a

| Type | Valve body size | $K_v$ | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ($m^3/h$) | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 1.5 | 1.9 | 2.5 | 3.2 | 4.0 | 4.9 | 5.9 |
| ICS25-10 | | 3.5 | 3.0 | 4.0 | 5.2 | 6.5 | 8.2 | 10.0 | 12.1 |
| ICS25-15 | | 6 | 5.2 | 6.9 | 8.9 | 11.2 | 14.0 | 17.2 | 20.8 |
| ICS25-20 | | 8 | 6.9 | 9.1 | 11.9 | 15.0 | 18.6 | 23.0 | 28.0 |
| ICS25-25 | | 11.5 | 9.9 | 13.1 | 17.1 | 22.0 | 27.0 | 33.0 | 40.0 |
| ICS32 | 32 | 17 | 14.7 | 19.0 | 25.0 | 32.0 | 40.0 | 49.0 | 59.0 |
| ICS40 | 40 | 27 | 23.0 | 31.0 | 40.0 | 51.0 | 63.0 | 77.0 | 94.0 |
| ICS50 | 50 | 44 | 38.0 | 50.0 | 65.0 | 82.0 | 103 | 126 | 153 |
| ICS65 | 65 | 70 | 60.0 | 80.0 | 104 | 131 | 163 | 200 | 243 |
| ICS80 | 80 | 85 | 73 | 97 | 126 | 160 | 199 | 244 | 295 |
| ICS100 | 100 | 142 | 123 | 161 | 210 | 267 | 332 | 407 | 493 |
| ICS125 | 125 | 207 | 179 | 235 | 307 | 389 | 484 | 594 | 719 |
| ICS150 | 150 | 354 | 305 | 402 | 524 | 665 | 828 | 1015 | 1230 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.66 |
| –10°C | 0.70 |
| 0°C | 0.76 |
| 10°C | 0.82 |
| 20°C | 0.90 |
| **30°C** | **1.00** |
| 40°C | 1.13 |
| 50°C | 1.29 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi
Superheating=12°F

### R 134a

| Type | Valve body size | $C_v$ | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | (USgal/min) | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.5 | 0.6 | 0.8 | 1.0 | 1.3 | 1.6 | 1.9 |
| ICS25-10 | | 4.1 | 0.9 | 1.2 | 1.6 | 2.0 | 2.6 | 3.2 | 4.0 |
| ICS25-15 | | 7 | 1.5 | 2.0 | 2.7 | 3.5 | 4.4 | 5.5 | 6.8 |
| ICS25-20 | | 9.3 | 2.0 | 2.7 | 3.6 | 4.7 | 5.9 | 7.4 | 9.1 |
| ICS25-25 | | 13.3 | 2.9 | 3.9 | 5.2 | 6.7 | 8.5 | 10.6 | 13.0 |
| ICS32 | 32 | 20 | 4.2 | 5.8 | 7.7 | 9.9 | 12.6 | 15.7 | 19.3 |
| ICS40 | 40 | 31 | 6.7 | 9.2 | 12.2 | 15.7 | 20.0 | 25.0 | 30.6 |
| ICS50 | 50 | 51 | 11.0 | 15.0 | 19.8 | 25.7 | 32.5 | 40.6 | 50.0 |
| ICS65 | 65 | 81 | 17.4 | 23.7 | 31.5 | 40.8 | 52.0 | 64.6 | 79.0 |
| ICS80 | 80 | 98 | 21 | 29 | 38 | 49 | 63 | 78 | 95 |
| ICS100 | 100 | 165 | 36 | 48 | 64 | 83 | 105 | 131 | 161 |
| ICS125 | 125 | 240 | 53 | 70 | 94 | 120 | 153 | 191 | 234 |
| ICS150 | 150 | 410 | 90 | 120 | 160 | 205 | 262 | 325 | 399 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for superheat ($T_S$)

| $T_s$ | Correction factor |
|---|---|
| 10°F | 1.00 |
| 14°F | 1.00 |
| 18°F | 1.00 |
| 20°F | 1.00 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.64 |
| 10°F | 0.68 |
| 30°F | 0.74 |
| 50°F | 0.81 |
| 70°F | 0.89 |
| **90°F** | **1.00** |
| 110°F | 1.15 |
| 130°F | 1.35 |

**Nominal capacities**

## SI units

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

### Dry suction line

### R 404A

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 1.4 | 1.8 | 2.4 | 3.0 | 3.8 | 4.6 | 5.7 | 6.8 |
| ICS25-10 | | 3.5 | 2.8 | 3.7 | 4.8 | 6.2 | 7.7 | 9.5 | 11.6 | 14.0 |
| ICS25-15 | | 6 | 4.8 | 6.4 | 8.3 | 10.6 | 13.2 | 16.4 | 20.0 | 24.0 |
| ICS25-20 | | 8 | 6.4 | 8.5 | 11.0 | 14.0 | 17.7 | 22.0 | 26.5 | 32.0 |
| ICS25-25 | | 11.5 | 9.1 | 12.2 | 16.0 | 20.3 | 25.5 | 31.3 | 38.0 | 46.0 |
| ICS32 | 32 | 17 | 13.5 | 18.0 | 23.5 | 30.0 | 37.5 | 46.0 | 56.0 | 68.0 |
| ICS40 | 40 | 27 | 21.5 | 28.5 | 37.0 | 47.5 | 60.0 | 74.0 | 90.0 | 108 |
| ICS50 | 50 | 44 | 35.0 | 47.0 | 61.0 | 78.0 | 97.0 | 120 | 146 | 175 |
| ICS65 | 65 | 70 | 55.0 | 74.0 | 97.0 | 123.0 | 155 | 190 | 232 | 280 |
| ICS80 | 80 | 85 | 68 | 90 | 118 | 150 | 188 | 232 | 282 | 340 |
| ICS100 | 100 | 142 | 113 | 151 | 197 | 250 | 314 | 387 | 471 | 568 |
| ICS125 | 125 | 207 | 165 | 220 | 287 | 365 | 458 | 564 | 687 | 827 |
| ICS150 | 150 | 354 | 283 | 375 | 490 | 624 | 783 | 964 | 1175 | 1415 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.55 |
| –10°C | 0.60 |
| 0°C | 0.66 |
| 10°C | 0.74 |
| 20°C | 0.85 |
| **30°C** | **1.00** |
| 40°C | 1.23 |
| 50°C | 1.68 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi
Superheat =12°F

### R 404A

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.4 | 0.5 | 0.7 | 0.9 | 1.1 | 1.4 | 1.8 | 2.1 |
| ICS25-10 | | 4.1 | 0.7 | 1.0 | 1.4 | 1.8 | 2.3 | 2.9 | 3.6 | 4.4 |
| ICS25-15 | | 7 | 1.3 | 1.8 | 2.4 | 3.1 | 4.0 | 5.0 | 6.2 | 7.5 |
| ICS25-20 | | 9.3 | 1.7 | 2.3 | 3.1 | 4.1 | 5.3 | 6.6 | 8.2 | 10.0 |
| ICS25-25 | | 13.3 | 2.4 | 3.4 | 4.5 | 5.9 | 7.6 | 9.6 | 11.8 | 14.4 |
| ICS32 | 32 | 20 | 3.6 | 5.0 | 6.7 | 8.8 | 11.2 | 14.1 | 17.5 | 21.3 |
| ICS40 | 40 | 31 | 5.7 | 7.9 | 10.6 | 13.9 | 17.8 | 22.4 | 27.7 | 34.0 |
| ICS50 | 50 | 51 | 9.3 | 12.9 | 17.3 | 22.7 | 29.0 | 36.6 | 45.1 | 55.0 |
| ICS65 | 65 | 81 | 14.8 | 20.5 | 27.5 | 36.0 | 46.2 | 58.0 | 72.0 | 88.0 |
| ICS80 | 80 | 98 | 18 | 25 | 33 | 43 | 55 | 70 | 87 | 105 |
| ICS100 | 100 | 165 | 30 | 42 | 56 | 73 | 93 | 118 | 146 | 177 |
| ICS125 | 125 | 240 | 44 | 60 | 82 | 107 | 136 | 171 | 213 | 258 |
| ICS150 | 150 | 410 | 75 | 103 | 139 | 182 | 232 | 292 | 363 | 441 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for superheat ($T_S$)

| $T_s$ | Correction factor |
|---|---|
| 10°F | 1.00 |
| 14°F | 1.00 |
| 18°F | 1.00 |
| 20°F | 1.00 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.52 |
| 10°F | 0.57 |
| 30°F | 0.63 |
| 50°F | 0.72 |
| 70°F | 0.83 |
| **90°F** | **1.00** |
| 110°F | 1.29 |
| 130°F | 1.92 |

**Nominal capacities**

## SI units

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

### R 22

Dry suction line

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 1.7 | 2.3 | 2.9 | 3.6 | 4.4 | 5.3 | 6.2 | 7.4 |
| ICS25-10 | | 3.5 | 3.6 | 4.7 | 5.9 | 7.4 | 9.0 | 10.9 | 12.9 | 15.2 |
| ICS25-15 | | 6 | 6.2 | 8.0 | 10.1 | 12.6 | 15.4 | 18.6 | 22.0 | 26.0 |
| ICS25-20 | | 8 | 8.2 | 10.7 | 13.5 | 16.8 | 20.6 | 24.8 | 29.4 | 34.6 |
| ICS25-25 | | 11.5 | 11.8 | 15.3 | 19.4 | 24.2 | 29.6 | 35.7 | 42.2 | 49.8 |
| ICS32 | 32 | 17 | 17.5 | 22.7 | 28.7 | 35.7 | 43.7 | 52.7 | 62.4 | 73.6 |
| ICS40 | 40 | 27 | 27.8 | 36.0 | 45.5 | 56.7 | 69.4 | 83.7 | 99.1 | 117 |
| ICS50 | 50 | 44 | 45.3 | 58.6 | 74.2 | 92.4 | 113 | 136 | 162 | 190 |
| ICS65 | 65 | 70 | 72.0 | 93.3 | 118 | 147 | 180 | 217 | 257 | 303 |
| ICS80 | 80 | 85 | 87 | 114 | 144 | 179 | 219 | 264 | 312 | 368 |
| ICS100 | 100 | 142 | 146 | 190 | 240 | 299 | 365 | 441 | 521 | 615 |
| ICS125 | 125 | 207 | 212 | 277 | 349 | 436 | 533 | 642 | 760 | 897 |
| ICS150 | 150 | 354 | 363 | 473 | 598 | 745 | 911 | 1098 | 1300 | 1534 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.71 |
| –10°C | 0.75 |
| 0°C | 0.80 |
| 10°C | 0.86 |
| 20°C | 0.92 |
| **30°C** | **1.00** |
| 40°C | 1.09 |
| 50°C | 1.22 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi
Superheat =12°F

### R 22

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 0.5 | 0.7 | 0.8 | 1.1 | 1.3 | 1.6 | 2.0 | 2.3 |
| ICS25-10 | | 4.1 | 1.0 | 1.3 | 1.7 | 2.2 | 2.7 | 3.4 | 4.0 | 4.8 |
| ICS25-15 | | 7 | 1.7 | 2.3 | 3.0 | 3.8 | 4.7 | 5.7 | 6.9 | 8.2 |
| ICS25-20 | | 9.3 | 2.3 | 3.0 | 3.9 | 5.0 | 6.2 | 7.6 | 9.2 | 10.9 |
| ICS25-25 | | 13.3 | 3.2 | 4.3 | 5.6 | 7.2 | 8.9 | 10.9 | 13.1 | 15.6 |
| ICS32 | 32 | 20 | 4.9 | 6.5 | 8.5 | 10.8 | 13.4 | 16.4 | 19.8 | 23.5 |
| ICS40 | 40 | 31 | 7.5 | 10.1 | 13.1 | 16.7 | 20.8 | 25.4 | 30.6 | 36.4 |
| ICS50 | 50 | 51 | 12.4 | 16.6 | 21.6 | 27.5 | 34.2 | 41.8 | 50.4 | 59.9 |
| ICS65 | 65 | 81 | 19.7 | 26.4 | 34.3 | 43.6 | 54.3 | 66.4 | 80.0 | 95.1 |
| ICS80 | 80 | 98 | 24 | 32 | 41 | 53 | 65 | 80 | 97 | 115 |
| ICS100 | 100 | 165 | 40 | 54 | 69 | 89 | 110 | 135 | 163 | 193 |
| ICS125 | 125 | 240 | 59 | 79 | 101 | 130 | 160 | 196 | 237 | 281 |
| ICS150 | 150 | 410 | 100 | 134 | 172 | 222 | 273 | 335 | 405 | 480 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for superheat ($T_S$)

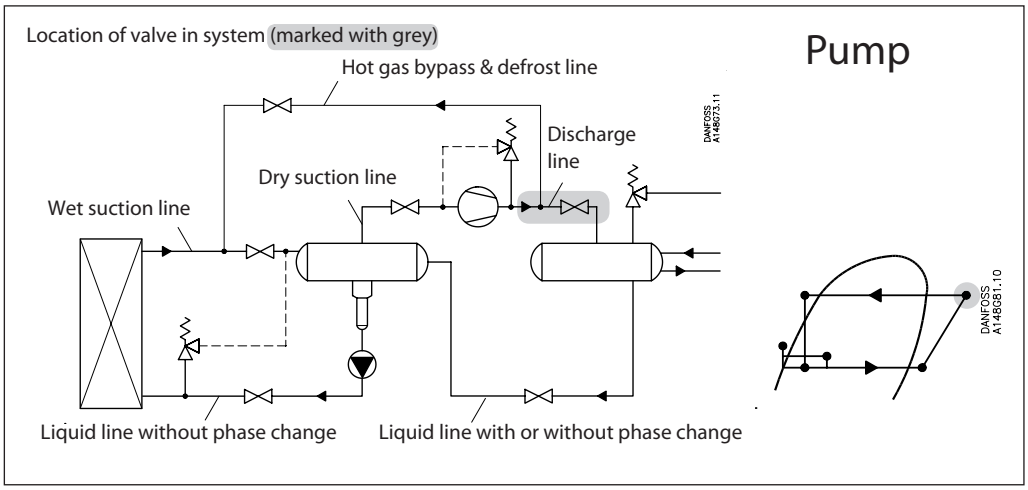
| $T_s$ | Correction factor |
|---|---|
| 10°F | 1.00 |
| 14°F | 1.00 |
| 18°F | 1.00 |
| 20°F | 1.00 |

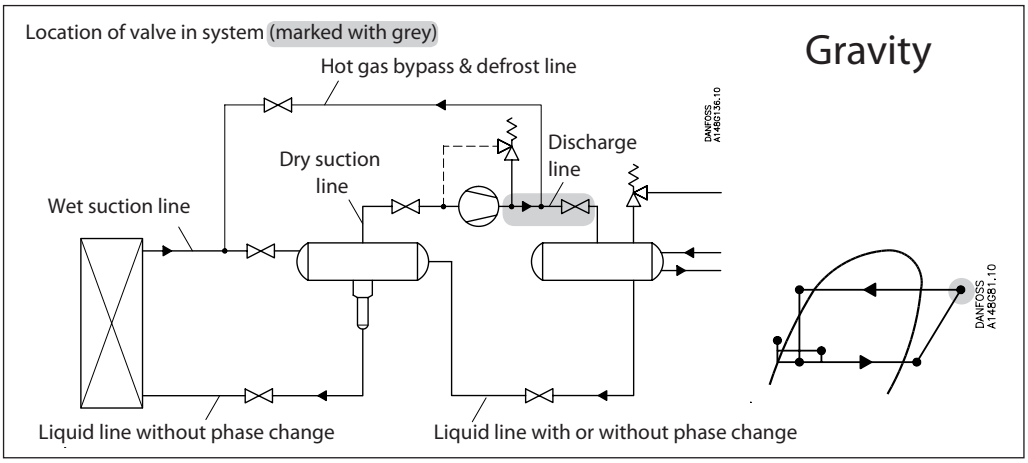
Correction factor for liquid temperature ($T_{liq}$)

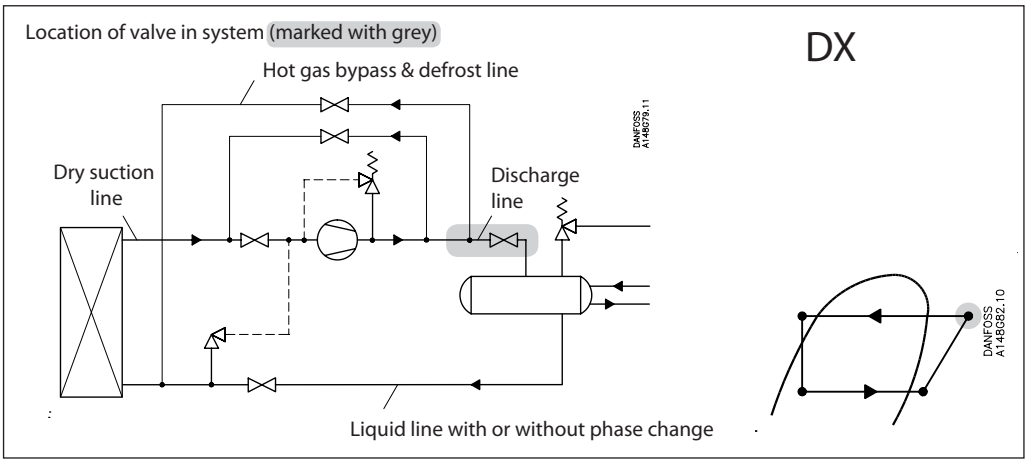
| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.73 |
| 10°F | 0.77 |
| 30°F | 0.82 |
| 50°F | 0.87 |
| 70°F | 0.93 |
| **90°F** | **1.00** |
| 110°F | 1.09 |
| 130°F | 1.20 |

## Nominal capacities

# Discharge line



**Nominal capacities**

## Discharge line

## SI units

Calculation example (R 717 capacities):

An application has following running conditions:

$T_e$ = –20 °C
$Q_o$ = 90 kW
$T_{liq}$ = 10°C
Max. Δp = 0.4 bar
$T_{disch.}$ = 60°C

The capacity table is based on nominal condition (Δp = 0.2 bar, $T_{liq}$ = 30°C, $P_{disch.}$= 12 bar, $T_{disch.}$= 80°C)
Therefore the actual capacity must be corrected to nominal condition by means of correction factors.

Correction factor for Δp 0.4 bar $f_{\Delta p}$ = 0.71
Correction factor for liquid temperature $f_{Tliq}$ = 0.92
Correction factor for $T_{disch.}$ 60°C , $f_{disch.}$ = 0.97

$Q_n = Q_o \times f_{\Delta p} \times f_{Tliq} \times f_{Tdisch.} =$
$90 \times 0.71 \times 0.92 \times 0.97 = 57$ kW

From the capacity table a ICS 25-15 with $Q_n$ capacity 73 kW is selected.

## US units

Calculation example (R 717 capacities):

An application has following running conditions:

$T_e$ = 0°F
$Q_o$ = 18 TR
$T_{liq}$ = 50 °F
Max. Δp = 5.8 psi
$T_{disch.}$ = 120°F

The capacity table is based on nominal conditions (Δp = 3 psi, $T_{liq}$ = 90°F, $P_{disch.}$= 185 psi, $T_{disch.}$= 180°F )

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

Correction factor for Δp 5.8 psi, $f_{\Delta p}$ = 0.72
Correction factor for liquid temperature $f_{Tliq}$ = 0.92
Correction factor for $T_{disch.}$ 120°C , $f_{disch.}$ = 0.95

$Q_n = Q_o \times f_{\Delta p} \times f_{Tliq} \times f_{Tdisch.} =$
$18 \times 0.72 \times 0.92 \times 0.95 = 11.3$ TR

From the capacity table a ICS 25-10 with $Q_n$ capacity 12.0 TR is selected.

## Nominal capacities

# Discharge line

## SI units

Capacity table for nominal conditions, $Q_N$ [kW],
$T_{liq}$ = 30°C,
$P_{disch.}$ = 12 bar,
$\Delta P$ = 0.2 bar,
$T_{disch.}$ = 80°C
Superheat = 8°C

### R 717

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 19.8 | 20.2 | 20.5 | 20.7 | 20.9 | 21.1 | 21.3 | 21.5 |
| ICS25-10 | | 3.5 | 40.8 | 41.5 | 42.0 | 42.5 | 43.0 | 43.5 | 44.0 | 44.2 |
| ICS25-15 | | 6 | 70.0 | 71.0 | 72.0 | 73.0 | 74.0 | 74.8 | 75.4 | 76.0 |
| ICS25-20 | | 8 | 93.0 | 95.0 | 96.0 | 97.5 | 99.0 | 99.7 | 101 | 101 |
| ICS25-25 | | 11.5 | 134 | 136 | 138 | 140 | 142 | 143 | 144 | 145 |
| ICS32 | 32 | 17 | 199 | 201 | 205 | 207 | 209 | 211 | 213 | 215 |
| ICS40 | 40 | 27 | 315 | 320 | 325 | 329 | 333 | 336 | 339 | 341 |
| ICS50 | 50 | 44 | 514 | 521 | 529 | 536 | 542 | 548 | 553 | 556 |
| ICS65 | 65 | 70 | 817 | 829 | 843 | 854 | 864 | 872 | 879 | 885 |
| ICS80 | 80 | 85 | 991 | 1007 | 1022 | 1035 | 1048 | 1058 | 1067 | 1074 |
| ICS100 | 100 | 142 | 1656 | 1682 | 1707 | 1729 | 1750 | 1767 | 1783 | 1794 |
| ICS125 | 125 | 207 | 2414 | 2453 | 2489 | 2521 | 2551 | 2575 | 2600 | 2616 |
| ICS150 | 150 | 354 | 4129 | 4194 | 4257 | 4311 | 4363 | 4404 | 4446 | 4473 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 50°C | 0.96 |
| 60°C | 0.97 |
| **80°C** | **1.00** |
| 90°C | 1.01 |
| 100°C | 1.03 |
| 110°C | 1.04 |
| 120°C | 1.06 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.82 |
| –10°C | 0.86 |
| 0°C | 0.88 |
| 10°C | 0.92 |
| 20°C | 0.96 |
| **30°C** | **1.00** |
| 40°C | 1.04 |
| 50°C | 1.09 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 2.9 psi,
$P_{disch.}$ = 185 psi,
$T_{disch.}$ = 180°F
Superheat = 12°F

### R 717

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 5.6 | 5.7 | 5.8 | 5.8 | 5.9 | 6.0 | 6.0 | 6.0 |
| ICS25-10 | | 4.1 | 11.4 | 11.6 | 11.8 | 12.0 | 12.1 | 12.3 | 12.3 | 12.4 |
| ICS25-15 | | 7 | 19.6 | 20.0 | 20.3 | 20.6 | 20.8 | 21.0 | 21.2 | 21.3 |
| ICS25-20 | | 9.3 | 26.2 | 26.6 | 27.0 | 27.4 | 27.8 | 28.0 | 28.2 | 28.3 |
| ICS25-25 | | 13.3 | 37.6 | 38.3 | 39.0 | 39.4 | 39.9 | 40.3 | 40.5 | 40.8 |
| ICS32 | 32 | 20 | 55.5 | 56.5 | 57.5 | 58.3 | 59.0 | 59.5 | 60.0 | 60.3 |
| ICS40 | 40 | 31 | 88.0 | 90.0 | 91.0 | 92.5 | 94.0 | 94.5 | 95.0 | 95.7 |
| ICS50 | 50 | 51 | 144 | 146 | 149 | 151 | 153 | 154 | 155 | 156 |
| ICS65 | 65 | 81 | 229 | 233 | 237 | 240 | 243 | 245 | 247 | 248 |
| ICS80 | 80 | 98 | 275 | 280 | 285 | 289 | 292 | 295 | 297 | 298 |
| ICS100 | 100 | 165 | 464 | 472 | 480 | 486 | 492 | 497 | 500 | 502 |
| ICS125 | 125 | 240 | 674 | 687 | 698 | 707 | 716 | 723 | 727 | 731 |
| ICS150 | 150 | 410 | 1152 | 1173 | 1192 | 1207 | 1223 | 1235 | 1242 | 1248 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 120°F | 0.95 |
| 140°F | 0.97 |
| 180°F | 1.00 |
| 200°F | 1.02 |
| 210°F | 1.02 |
| 230°F | 1.04 |
| 250°F | 1.06 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.82 |
| 10°F | 0.85 |
| 30°F | 0.88 |
| 50°F | 0.92 |
| 70°F | 0.96 |
| 90°F | 1.00 |
| 110°F | 1.04 |
| 130°F | 1.09 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW],
$T_{liq}$ = 10°C,
$P_{disch}$ = 10 bar,
ΔP = 0.2 bar
$T_{disch}$ = 80°C
Superheat = 8°C

### Discharge line

### R 744

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 12.5 | 12.7 | 12.8 | 12.9 | 12.9 | 12.9 | 12.5 | 12.8 |
| ICS25-10 | | 3.5 | 25.7 | 26.2 | 26.5 | 26.6 | 26.6 | 26.3 | 25.8 | 26.4 |
| ICS25-15 | | 6 | 44.0 | 45.0 | 45.3 | 45.6 | 45.5 | 45.1 | 44.2 | 45.0 |
| ICS25-20 | | 8 | 59.0 | 60.0 | 60.2 | 60.7 | 60.7 | 60.1 | 59.0 | 60.0 |
| ICS25-25 | | 11.5 | 85.0 | 86.0 | 87.0 | 87.4 | 87.3 | 86.5 | 85.0 | 87.0 |
| ICS32 | 32 | 17 | 125 | 127 | 128 | 129 | 129 | 128 | 125 | 128 |
| ICS40 | 40 | 27 | 199 | 202 | 204 | 205 | 205 | 203 | 199 | 203 |
| ICS50 | 50 | 44 | 324 | 329 | 332 | 334 | 334 | 331 | 324 | 331 |
| ICS65 | 65 | 70 | 515 | 523 | 529 | 532 | 531 | 526 | 516 | 527 |
| ICS80 | 80 | 85 | 626 | 636 | 642 | 646 | 645 | 640 | 626 | 640 |
| ICS100 | 100 | 142 | 1045 | 1062 | 1072 | 1078 | 1078 | 1069 | 1046 | 1069 |
| ICS125 | 125 | 207 | 1524 | 1549 | 1562 | 1572 | 1571 | 1558 | 1525 | 1558 |
| ICS150 | 150 | 354 | 2605 | 2649 | 2672 | 2688 | 2687 | 2664 | 2608 | 2664 |

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

| ΔP (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 50°C | 0.96 |
| 60°C | 0.97 |
| **80°C** | **1.00** |
| 90°C | 1.01 |
| 100°C | 1.03 |
| 110°C | 1.04 |
| 120°C | 1.06 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.52 |
| –10°C | 0.67 |
| 0°C | 0.91 |
| **10°C** | **1.00** |
| 15°C | 1.09 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
ΔP = 3 psi
$P_{disch}$ = 120 psi,
$T_{disch}$ = 180°F
Superheat = 12°F

### R 744

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 3.4 | 3.4 | 3.5 | 3.5 | 3.4 | 3.3 | 3.2 | 3.1 |
| ICS25-10 | | 4.1 | 6.9 | 7.0 | 7.1 | 7.1 | 7.0 | 6.8 | 6.6 | 6.4 |
| ICS25-15 | | 7 | 11.9 | 12.1 | 12.2 | 12.2 | 12.0 | 11.7 | 11.3 | 11.0 |
| ICS25-20 | | 9.3 | 15.8 | 16.1 | 16.2 | 16.2 | 16.0 | 15.6 | 15.1 | 14.7 |
| ICS25-25 | | 13.3 | 22.8 | 23.1 | 23.3 | 23.3 | 23.0 | 22.4 | 21.8 | 21.1 |
| ICS32 | 32 | 20 | 33.7 | 34.1 | 34.5 | 34.5 | 34.0 | 33.1 | 32.2 | 31.2 |
| ICS40 | 40 | 31 | 53.4 | 54.3 | 54.7 | 54.7 | 54.0 | 52.5 | 51.0 | 49.6 |
| ICS50 | 50 | 51 | 87.0 | 88.4 | 89.0 | 89.0 | 88.0 | 85.5 | 83.3 | 80.8 |
| ICS65 | 65 | 81 | 138 | 141 | 142 | 142 | 140 | 136 | 132 | 129 |
| ICS80 | 80 | 98 | 167 | 169 | 171 | 171 | 168 | 164 | 159 | 154 |
| ICS100 | 100 | 165 | 281 | 285 | 288 | 288 | 284 | 276 | 268 | 260 |
| ICS125 | 125 | 240 | 408 | 414 | 419 | 419 | 412 | 401 | 389 | 378 |
| ICS150 | 150 | 410 | 698 | 708 | 715 | 715 | 705 | 685 | 665 | 646 |

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

| ΔP (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 120°F | 0.95 |
| 140°F | 0.97 |
| **180°F** | **1.00** |
| 200°F | 1.02 |
| 210°F | 1.02 |
| 230°F | 1.04 |
| 250°F | 1.05 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.48 |
| 10°F | 0.64 |
| 30°F | 0.88 |
| **50°F** | **1.00** |

**Nominal capacities**

# Discharge line

## SI units

Capacity table for nominal conditions, $Q_N$ [kW],
$T_{liq}$ = 30°C,
$P_{disch}$ = 8 bar,
$\Delta P$ = 0.2 bar
$T_{disch}$ = 80°C
Superheat = 8°C

### R 134a

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 5.1 | 5.4 | 5.6 | 5.9 | 6.1 | 6.3 | 6.5 |
| ICS25-10 | | 3.5 | 10.6 | 11.0 | 11.6 | 12.0 | 12.5 | 13.0 | 13.4 |
| ICS25-15 | | 6 | 18.1 | 19.0 | 19.8 | 20.6 | 21.5 | 22.3 | 23.0 |
| ICS25-20 | | 8 | 24.1 | 25.3 | 26.4 | 27.5 | 28.6 | 29.7 | 30.7 |
| ICS25-25 | | 11.5 | 34.7 | 36.0 | 38.0 | 39.6 | 41.0 | 42.7 | 44.0 |
| ICS32 | 32 | 17 | 51.0 | 54.0 | 56.0 | 58.5 | 61.0 | 63.0 | 65.0 |
| ICS40 | 40 | 27 | 82.0 | 85.0 | 89.0 | 93.0 | 97.0 | 100 | 104 |
| ICS50 | 50 | 44 | 133 | 139 | 145 | 151 | 157 | 163 | 169 |
| ICS65 | 65 | 70 | 211 | 221 | 231 | 241 | 251 | 260 | 269 |
| ICS80 | 80 | 85 | 256 | 268 | 280 | 293 | 304 | 315 | 326 |
| ICS100 | 100 | 142 | 428 | 448 | 469 | 489 | 508 | 527 | 544 |
| ICS125 | 125 | 207 | 624 | 654 | 683 | 712 | 741 | 768 | 794 |
| ICS150 | 150 | 354 | 1068 | 1118 | 1168 | 1218 | 1267 | 1313 | 1357 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 50°C | 0.96 |
| 60°C | 0.97 |
| **80°C** | **1.00** |
| 90°C | 1.01 |
| 100°C | 1.03 |
| 110°C | 1.04 |
| 120°C | 1.06 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.66 |
| –10°C | 0.70 |
| 0°C | 0.76 |
| 10°C | 0.82 |
| 20°C | 0.90 |
| **30°C** | **1.00** |
| 40°C | 1.13 |
| 50°C | 1.29 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi
$P_{disch}$ = 120 psi,
$T_{disch}$ = 180°F
Superheat = 12°F

### R 134a

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 1.4 | 1.5 | 1.5 | 1.6 | 1.7 | 1.7 | 1.8 |
| ICS25-10 | | 4.1 | 2.3 | 3.0 | 3.1 | 3.3 | 3.4 | 3.6 | 3.7 |
| ICS25-15 | | 7 | 4.9 | 5.1 | 5.4 | 5.6 | 5.9 | 6.1 | 6.3 |
| ICS25-20 | | 9.3 | 6.5 | 6.8 | 7.2 | 7.5 | 7.8 | 8.1 | 8.4 |
| ICS25-25 | | 13.3 | 9.3 | 9.8 | 10.3 | 10.8 | 11.3 | 11.7 | 12.1 |
| ICS32 | 32 | 20 | 13.8 | 14.5 | 15.2 | 16.0 | 16.6 | 17.3 | 18.0 |
| ICS40 | 40 | 31 | 21.9 | 23.0 | 24.2 | 25.3 | 26.5 | 27.5 | 28.5 |
| ICS50 | 50 | 51 | 35.6 | 37.5 | 39.4 | 41.3 | 43.0 | 44.8 | 46.5 |
| ICS65 | 65 | 81 | 56.7 | 59.7 | 62.9 | 65.7 | 68.5 | 71.3 | 74.0 |
| ICS80 | 80 | 98 | 67 | 72 | 75 | 79 | 83 | 86 | 89 |
| ICS100 | 100 | 165 | 113 | 121 | 127 | 133 | 139 | 144 | 150 |
| ICS125 | 125 | 240 | 164 | 176 | 184 | 194 | 202 | 210 | 218 |
| ICS150 | 150 | 410 | 280 | 301 | 315 | 331 | 345 | 358 | 372 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 120°F | 0.95 |
| 140°F | 0.97 |
| **180°F** | **1.00** |
| 200°F | 1.02 |
| 210°F | 1.02 |
| 230°F | 1.04 |
| 250°F | 1.05 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.64 |
| 10°F | 0.68 |
| 30°F | 0.74 |
| 50°F | 0.81 |
| 70°F | 0.89 |
| **90°F** | **1.00** |
| 110°F | 1.15 |
| 130°F | 1.35 |

**Nominal capacities**

## SI units

Capacity table for nominal conditions, $Q_N$ [kW],
$T_{liq}$ = 30°C,
$P_{disch}$ = 12 bar
$\Delta P$ = 0.2 bar,
$T_{disch}$ = 80°C
Superheat = 8°C

## Discharge line

### R 404A

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 4.8 | 5.1 | 5.4 | 5.7 | 6.0 | 6.3 | 6.6 | 6.8 |
| ICS25-10 | | 3.5 | 9.8 | 10.4 | 11.1 | 11.8 | 12.4 | 13.0 | 13.6 | 14.1 |
| ICS25-15 | | 6 | 16.7 | 18.0 | 19.0 | 20.2 | 21.3 | 22.3 | 23.3 | 24.2 |
| ICS25-20 | | 8 | 22.3 | 24.0 | 25.4 | 27.0 | 28.3 | 29.7 | 31.0 | 32.0 |
| ICS25-25 | | 11.5 | 32.0 | 34.0 | 36.5 | 38.5 | 40.7 | 42.7 | 44.6 | 46.0 |
| ICS32 | 32 | 17 | 48.0 | 51.0 | 54.0 | 57.0 | 60.0 | 63.0 | 66.0 | 69.0 |
| ICS40 | 40 | 27 | 75.0 | 81.0 | 86.0 | 91.0 | 96.0 | 100 | 105 | 109 |
| ICS50 | 50 | 44 | 123 | 131 | 140 | 148 | 156 | 163 | 171 | 177 |
| ICS65 | 65 | 70 | 195 | 208 | 222 | 235 | 248 | 260 | 271 | 282 |
| ICS80 | 80 | 85 | 238 | 254 | 270 | 286 | 301 | 315 | 330 | 342 |
| ICS100 | 100 | 142 | 397 | 424 | 451 | 477 | 503 | 527 | 551 | 571 |
| ICS125 | 125 | 207 | 579 | 618 | 657 | 696 | 733 | 768 | 803 | 833 |
| ICS150 | 150 | 354 | 990 | 1057 | 1124 | 1190 | 1254 | 1313 | 1374 | 1424 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 50°C | 0.96 |
| 60°C | 0.97 |
| **80°C** | **1.00** |
| 90°C | 1.01 |
| 100°C | 1.03 |
| 110°C | 1.04 |
| 120°C | 1.06 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.55 |
| –10°C | 0.60 |
| 0°C | 0.66 |
| 10°C | 0.74 |
| 20°C | 0.85 |
| **30°C** | **1.00** |
| 40°C | 1.23 |
| 50°C | 1.68 |

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi,
$P_{disch}$ = 120 psi,
$T_{disch}$ = 180°F
Superheat = 12°F

### R 404A

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.8 |
| ICS25-10 | | 4.1 | 2.5 | 2.7 | 2.9 | 3.1 | 3.3 | 3.5 | 3.7 | 3.8 |
| ICS25-15 | | 7 | 4.4 | 4.7 | 5.0 | 5.4 | 5.7 | 6.0 | 6.3 | 6.5 |
| ICS25-20 | | 9.3 | 5.8 | 6.2 | 6.7 | 7.2 | 7.6 | 8.0 | 8.4 | 8.7 |
| ICS25-25 | | 13.3 | 8.4 | 8.9 | 9.6 | 10.3 | 10.9 | 11.5 | 12.0 | 12.5 |
| ICS32 | 32 | 20 | 12.4 | 13.2 | 14.2 | 15.2 | 16.1 | 17.0 | 17.8 | 18.4 |
| ICS40 | 40 | 31 | 19.6 | 21.0 | 22.6 | 24.1 | 25.6 | 27.0 | 28.2 | 29.3 |
| ICS50 | 50 | 51 | 32.0 | 34.2 | 36.8 | 39.3 | 41.7 | 44.0 | 46.0 | 47.7 |
| ICS65 | 65 | 81 | 51.0 | 54.3 | 58.5 | 62.5 | 66.3 | 70.0 | 73.0 | 76.0 |
| ICS80 | 80 | 98 | 61 | 65 | 70 | 75 | 80 | 84 | 88 | 91 |
| ICS100 | 100 | 165 | 103 | 110 | 118 | 127 | 134 | 142 | 149 | 153 |
| ICS125 | 125 | 240 | 149 | 160 | 172 | 184 | 195 | 206 | 216 | 223 |
| ICS150 | 150 | 410 | 255 | 273 | 294 | 315 | 334 | 352 | 369 | 381 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 120°F | 0.95 |
| 140°F | 0.97 |
| **180°F** | **1.00** |
| 200°F | 1.02 |
| 210°F | 1.02 |
| 230°F | 1.04 |
| 250°F | 1.05 |

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

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.52 |
| 10°F | 0.57 |
| 30°F | 0.63 |
| 50°F | 0.72 |
| 70°F | 0.83 |
| **90°F** | **1.00** |
| 110°F | 1.29 |
| 130°F | 1.92 |

**Nominal capacities**

# Discharge line

## R 22

## SI units

Capacity table for nominal conditions, $Q_N$ [kW],
$T_{liq}$ = 30°C,
$P_{disch}$ = 12 bar
$\Delta P$ = 0.2 bar,
$T_{disch}$ = 80°C
Superheat = 8°C

| Type | Valve body size | $K_v$ (m³/h) | Evaporating temperature [°C] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –50 | –40 | –30 | –20 | –10 | 0 | 10 | 20 |
| ICS25-5 | 25 | 1.7 | 6.4 | 6.6 | 6.8 | 7.0 | 7.2 | 7.4 | 7.5 | 7.7 |
| ICS25-10 | | 3.5 | 13.2 | 13.7 | 14.1 | 14.5 | 14.8 | 15.2 | 15.5 | 15.8 |
| ICS25-15 | | 6 | 22.6 | 23.4 | 24.1 | 24.8 | 25.4 | 26.0 | 26.6 | 27.1 |
| ICS25-20 | | 8 | 30.2 | 31.2 | 32.1 | 33.0 | 33.8 | 34.6 | 35.4 | 36.1 |
| ICS25-25 | | 11.5 | 43.4 | 44.9 | 46.2 | 47.5 | 48.6 | 49.8 | 50.9 | 51.9 |
| ICS32 | 32 | 17 | 64.1 | 66.3 | 68.2 | 70.2 | 71.9 | 73.6 | 75.3 | 76.7 |
| ICS40 | 40 | 27 | 102 | 105 | 108 | 111 | 114 | 117 | 120 | 122 |
| ICS50 | 50 | 44 | 166 | 172 | 177 | 182 | 186 | 190 | 195 | 199 |
| ICS65 | 65 | 70 | 264 | 273 | 281 | 289 | 296 | 303 | 310 | 316 |
| ICS80 | 80 | 85 | 321 | 331 | 341 | 351 | 359 | 368 | 376 | 384 |
| ICS100 | 100 | 142 | 536 | 554 | 570 | 586 | 600 | 615 | 629 | 641 |
| ICS125 | 125 | 207 | 781 | 807 | 831 | 855 | 875 | 897 | 917 | 935 |
| ICS150 | 150 | 354 | 1335 | 1381 | 1421 | 1461 | 1497 | 1534 | 1568 | 1599 |

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

| $\Delta P$ (bar) | Correction factor |
|---|---|
| **0.2** | **1.00** |
| 0.25 | 0.89 |
| 0.3 | 0.82 |
| 0.4 | 0.71 |
| 0.5 | 0.63 |
| 0.6 | 0.58 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 50°C | 0.96 |
| 60°C | 0.97 |
| **80°C** | **1.00** |
| 90°C | 1.01 |
| 100°C | 1.03 |
| 110°C | 1.04 |
| 120°C | 1.06 |

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

| Liquid temperature | Correction factor |
|---|---|
| –20°C | 0.71 |
| –10°C | 0.75 |
| 0°C | 0.80 |
| 10°C | 0.86 |
| 20°C | 0.92 |
| **30°C** | **1.00** |
| 40°C | 1.09 |
| 50°C | 1.22 |

## R 22

## US units

Capacity table for nominal conditions, $Q_N$ [Tons of Refrigeration],
$T_{liq}$ = 90°F,
$\Delta P$ = 3 psi,
$P_{disch}$ = 120 psi,
$T_{disch}$ = 180°F
Superheat = 12°F

| Type | Valve body size | $C_v$ (USgal/min) | Evaporating temperature [°F] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | –60°F | –40°F | –20°F | 0°F | 20°F | 40°F | 60°F | 80°F |
| ICS25-5 | 25 | 2 | 1.8 | 1.9 | 2.0 | 2.0 | 2.1 | 2.1 | 2.2 | 2.2 |
| ICS25-10 | | 4.1 | 3.7 | 3.9 | 4.0 | 4.1 | 4.3 | 4.4 | 4.5 | 4.6 |
| ICS25-15 | | 7 | 6.4 | 6.6 | 6.8 | 7.1 | 7.3 | 7.4 | 7.6 | 7.8 |
| ICS25-20 | | 9.3 | 8.5 | 8.8 | 9.1 | 9.4 | 9.6 | 9.9 | 10.1 | 10.3 |
| ICS25-25 | | 13.3 | 12.1 | 12.6 | 13.0 | 13.4 | 13.8 | 14.2 | 14.5 | 14.8 |
| ICS32 | 32 | 20 | 18.2 | 18.9 | 19.6 | 20.2 | 20.7 | 21.3 | 21.8 | 22.2 |
| ICS40 | 40 | 31 | 28.3 | 29.3 | 30.3 | 31.3 | 32.1 | 33.0 | 33.8 | 34.4 |
| ICS50 | 50 | 51 | 46.5 | 48.2 | 49.9 | 51.4 | 52.9 | 54.3 | 55.5 | 56.7 |
| ICS65 | 65 | 81 | 73.9 | 76.6 | 79.2 | 81.7 | 84.0 | 86.2 | 88.2 | 90.0 |
| ICS80 | 80 | 98 | 89 | 93 | 96 | 99 | 102 | 104 | 107 | 109 |
| ICS100 | 100 | 165 | 150 | 156 | 162 | 166 | 172 | 175 | 180 | 183 |
| ICS125 | 125 | 240 | 218 | 227 | 235 | 242 | 250 | 255 | 262 | 267 |
| ICS150 | 150 | 410 | 373 | 388 | 402 | 413 | 426 | 436 | 447 | 456 |

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

| $\Delta P$ (psi) | Correction factor |
|---|---|
| **3** | **1.00** |
| 4 | 0.87 |
| 5 | 0.79 |
| 6 | 0.72 |
| 7 | 0.66 |
| 8 | 0.62 |

Correction factor for discharge temperature ($T_{disch}$).

| Discharge temperature | Correction factor |
|---|---|
| 120°F | 0.95 |
| 140°F | 0.97 |
| **180°F** | **1.00** |
| 200°F | 1.02 |
| 210°F | 1.02 |
| 230°F | 1.04 |
| 250°F | 1.05 |

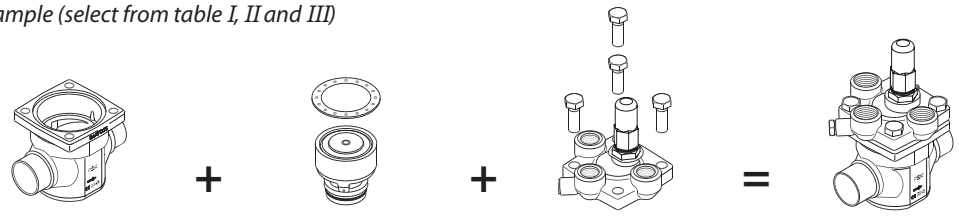
Correction factor for liquid temperature ($T_{liq}$).

| Liquid temperature | Correction factor |
|---|---|
| –10°F | 0.73 |
| 10°F | 0.77 |
| 30°F | 0.82 |
| 50°F | 0.87 |
| 70°F | 0.93 |
| **90°F** | **1.00** |
| 110°F | 1.09 |
| 130°F | 1.20 |

# ICS 25

## Ordering from the parts programme

*Example (select from table I, II and III)*

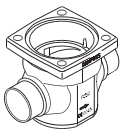


Valve body 25 D (1 in.)
**027H2120**
***Table I***

Function module ICS 25-15
**027H2203**
***Table II***

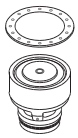
Top cover 3 pilots
**027H2173**
***Table III***

*ICV 25 valve body w/different connections* *Table I*



| 20 D (¾ in.) | 25 D (1 in.) | 32 D (1¼ in.) | 40 D (1½ in.) |
|---|---|---|---|
| **027H2128** | **027H2120** | **027H2129** | **027H2135** |
| 35 SD (1⅜ in. SA) | 28 SA (1⅛ in.) | 22 SA (⅞ in.) | 28 SD (1⅛ in.) |
| **027H2134** | **027H2126** | **027H2125** | **027H2124** |
| 22 SD (⅞ in.) | 20 A (¾ in.) | 25 A (1 in.) | 32 A (1¼ in.) |
| **027H2123** | **027H2131** | **027H2121** | **027H2130** |
| 20 SOC (¾ in.) | 25 SOC (1 in.) | 20 FPT (½ in.) | 25 FPT (1 in.) |
| **027H2132** | **027H2122** | **027H2133** | **027H2127** |

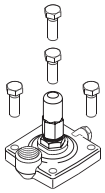
*ICS 25 function module* *Table II*



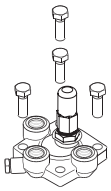
| Description | Code Number |
|---|---|
| ICS 25-5 | **027H2201** *) |
| ICS 25-10 | **027H2202** *) |
| ICS 25-15 | **027H2203** *) |
| ICS 25-20 | **027H2204** *) |
| ICS 25-25 | **027H2200** *) |

*) Including gasket and O-rings

*ICS 25 top cover* *Table III*



ICS 1



ICS 3

| Description | Code Number |
|---|---|
| Top cover 1 Pilot | **027H2172** *) |
| Top cover 3 Pilots | **027H2173** **) |

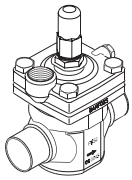
*) Including bolts
**) including bolts and one blanking plug

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ; SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

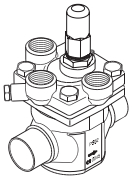
## Ordering complete factory assembled valve

*(body, function module and top cover)*

*Table A*



1 pilot



3 pilots

| | | Available connections | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 20 D (¾ in.) | 25 D (1 in.) | 32 D (1¼ in.) | 40 D (1½ in.) | 35 SD (1⅜ in. SA) | 28 SA (1⅛ in.) | 22 SA (⅞ in.) | 28 SD (1⅛ in.) |
| ICS 25-5 | 1 Pilot | **027H2028** | **027H2020** | | | | **027H2026** | **027H2025** | **027H2024** |
| | 3 Pilots *) | **027H2078** | **027H2070** | | | | **027H2076** | **027H2075** | **027H2074** |
| ICS 25-10 | 1 Pilot | **027H2038** | **027H2030** | | | | **027H2036** | **027H2035** | **027H2034** |
| | 3 Pilots *) | **027H2088** | **027H2080** | | | | **027H2086** | **027H2085** | **027H2084** |
| ICS 25-15 | 1 Pilot | **027H2048** | **027H2040** | | | | **027H2046** | **027H2045** | **027H2044** |
| | 3 Pilots *) | **027H2098** | **027H2090** | | | | **027H2096** | **027H2095** | **027H2094** |
| ICS 25-20 | 1 Pilot | **027H2058** | **027H2050** | | | | **027H2056** | **027H2055** | **027H2054** |
| | 3 Pilots *) | **027H2108** | **027H2100** | | | | **027H2106** | **027H2105** | **027H2104** |
| ICS 25-25 | 1 Pilot | **027H2068** | **027H2060** | | | | **027H2066** | **027H2065** | **027H2064** |
| | 3 Pilots *) | **027H2118** | **027H2110** | | | | **027H2116** | **027H2115** | **027H2114** |

| | | 22 SD (⅞ in.) | 20 A (¾ in.) | 25 A (1 in.) | 32 A (1¼ in.) | 20 SOC (¾ in.) | 25 SOC (1 in.) | 20 FPT (½ in.) | 25 FPT (1 in.) |
|---|---|---|---|---|---|---|---|---|---|
| ICS 25-5 | 1 Pilot | **027H2023** | **027H2029** | **027H2021** | | **027H2140** | | | |
| | 3 Pilots *) | **027H2073** | **027H2079** | **027H2071** | | **027H2145** | | | |
| ICS 25-10 | 1 Pilot | **027H2033** | **027H2039** | **027H2031** | | | | | |
| | 3 Pilots *) | **027H2083** | **027H2089** | **027H2081** | | **027H2146** | | | |
| ICS 25-15 | 1 Pilot | **027H2043** | **027H2049** | **027H2041** | | **027H2142** | | | |
| | 3 Pilots *) | **027H2093** | **027H2099** | **027H2091** | | | | | |
| ICS 25-20 | 1 Pilot | **027H2053** | **027H2059** | **027H2051** | | **027H2143** | | | |
| | 3 Pilots *) | **027H2103** | **027H2109** | **027H2101** | | **027H2148** | | | |
| ICS 25-25 | 1 Pilot | **027H2063** | | **027H2061** | | | **027H2062** | | |
| | 3 Pilots *) | **027H2113** | | **027H2111** | | | **027H2112** | | |

Select from parts programme

*) Including one blanking plug (A+B)

# ICS 32

## Ordering from the parts programme

*Example (select from table I, II and III)*



Valve body 32 D (1¼ in.)
**027H3120**
***Table I***

\+

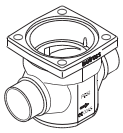
Function module ICS 32
**027H3200**
***Table II***

\+

Top cover 3 pilots
**027H3173**
***Table III***

=

*ICV 32 valve body w/different connections* *Table I*

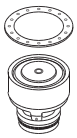


| 32 D (1¼ in.) | 40 D (1½ in.) | 42 SA (1⅝ in.) | 42 SD (1⅝ in.) |
|---|---|---|---|
| **027H3120** | **027H3125** | **027H3127** | **027H3128** |

| 35 SD (1⅜ in. SA) | 32 A (1¼ in.) | 32 SOC (1¼ in.) | 40 A (1½ in.) |
|---|---|---|---|
| **027H3123** | **027H3121** | **027H3122** | **027H3126** |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ;
SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

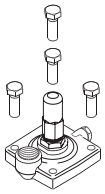
*ICS 32 function module* *Table II*



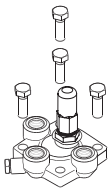
| Description | Code Number |
|---|---|
| ICS 32 | **027H3200** *) |

*) Including gasket and O-rings

*ICS 32 top cover* *Table III*



ICS 1



ICS 3

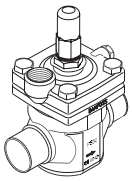
| Description | Code Number |
|---|---|
| Top cover 1 Pilot | **027H3172** *) |
| Top cover 3 Pilots | **027H3173** **) |

*) Including bolts
**) including bolts and one blanking plug

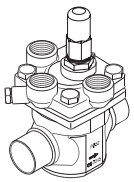
## Ordering complete factory assembled valve

*(body, function module and top cover)*

*Table A*



1 pilot



3 pilots

| | | Available connections | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 32 D (1¼ in.) | 40 D (1½ in.) | 42 SA (1⅝ in.) | 42 SD (1⅝ in.) | 35 SD (1⅜ in. SA) | 32 A (1¼ in.) | 32 SOC (1¼ in.) | 40 A (1½ in.) |
| ICS 32 | 1 Pilot | **027H3020** | | | | **027H3023** | **027H3021** | **027H3022** | |
| | 3 Pilots *) | **027H3030** | | | | **027H3033** | **027H3031** | **027H3032** | |

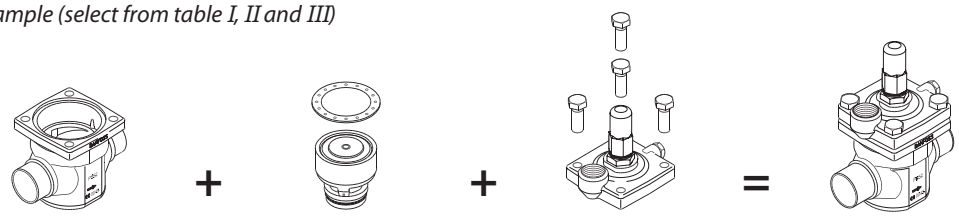
Select from parts programme

*) Including one blanking plug (A+B)

# ICS 40

## Ordering from the parts programme

*Example (select from table I, II and III)*

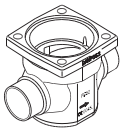


Valve body 50 D (2 in.)
**027H4126**
***Table I***

Function module ICS 40
**027H4200**
***Table II***

Top cover 1 pilot
**027H4172**
***Table III***

*ICV 40 valve body w/different connections* *Table I*

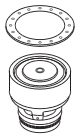


| 40 D (1½ in.) | 50 D (2 in.) | 42 SA (1⅝ in.) | 42 SD (1⅝ in.) |
|---|---|---|---|
| **027H4120** | **027H4126** | **027H4124** | **027H4123** |

| 40 A (1½ in.) | 40 SOC (1½ in.) | 50 A (2 in.) | |
|---|---|---|---|
| **027H4121** | **027H4122** | **027H4127** | |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ;
SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

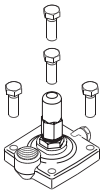
*ICS 40 function module* *Table II*



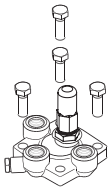
| Description | Code Number |
|---|---|
| ICS 40 | **027H4200** *) |

*) Including gasket and O-rings

*ICS 40 top cover* *Table III*



ICS 1



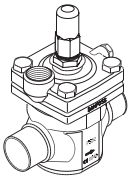
ICS 3

| Description | Code Number |
|---|---|
| Top cover 1 Pilot | **027H4172** *) |
| Top cover 3 Pilots | **027H4173** **) |

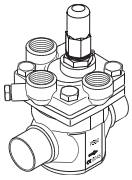
*) Including bolts
**) including bolts and one blanking plug

## Ordering complete factory assembled valve

*(body, function module and top cover)* *Table A*



1 pilot



3 pilots

| | | Available connections | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 40 D (1½ in.) | 50 D (2 in.) | 42 SA (1⅝ in.) | 42 SD (1⅝ in.) | 40 A (1½ in.) | 40 SOC (1½ in.) | 50 A (2 in.) |
| ICS 40 | 1 Pilot | **027H4020** | | **027H4024** | **027H4023** | **027H4021** | **027H4022** | |
| | 3 Pilots *) | **027H4030** | | **027H4034** | **027H4033** | **027H4031** | **027H4032** | |

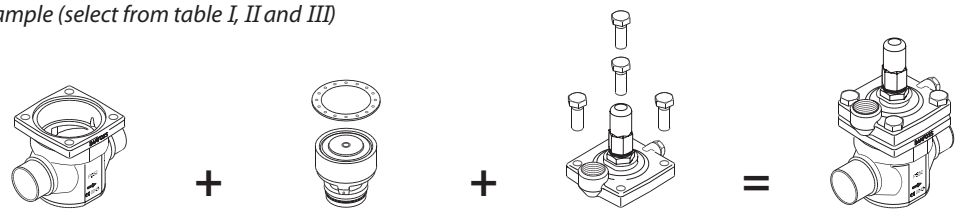
Select from parts programme

*) Including one blanking plug (A+B)

# ICS 50

## Ordering from the parts programme

*Example (select from table I, II and III)*

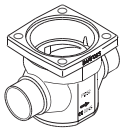


Valve body 65 D (2½ in.)
**027H5124**
***Table I***

Function module ICS 40
**027H5200**
***Table II***

Top cover 1 pilot
**027H5172**
***Table III***

*ICV 50 valve body w/different connections* *Table I*

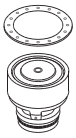


| 50 D (2 in.) | 65 D (2½ in.) | 54 SD (2⅛ in. SA) | 50 A (2 in.) |
|---|---|---|---|
| **027H5120** | **027H5124** | **027H5123** | **027H5121** |

| 50 SOC (2 in.) | 65 A (2½ in.) | | |
|---|---|---|---|
| **027H5122** | **027H5125** | | |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ;
SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

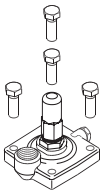
*ICS 50 function module* *Table II*



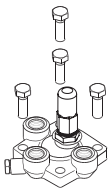
| Description | Code Number |
|---|---|
| ICS 50 | **027H5200** *) |

*) Including gasket and O-rings

*ICS 50 top cover* *Table III*



ICS 1



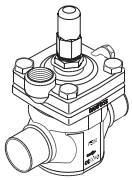
ICS 3

| Description | Code Number |
|---|---|
| Top cover 1 Pilot | **027H5172** *) |
| Top cover 3 Pilots | **027H5173** **) |

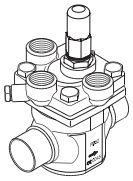
*) Including bolts
**) including bolts and one blanking plug

## Ordering complete factory assembled valve

*(body, function module and top cover)* *Table A*



1 pilot



3 pilots

| | | Available connections | | | | | |
|---|---|---|---|---|---|---|---|
| | | 50 D (2 in.) | 65 D (2½ in.) | 54 SD (2⅛ in. SA) | 65 A (2½ in.) | 50 A (2 in.) | 50 SOC (2 in.) |
| ICS 50 | 1 Pilot | **027H5020** | | **027H5023** | | **027H5021** | **027H5022** |
| | 3 Pilots *) | **027H5030** | | **027H5033** | | **027H5031** | **027H5032** |

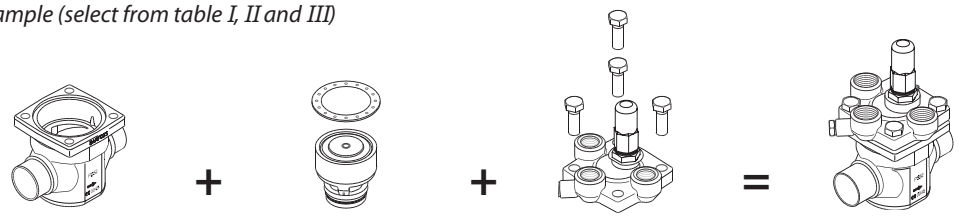
Select from parts programme

*) Including one blanking plug (A+B)

# ICS 65 and ICS 80

## Ordering from the parts programme

*Example (select from table I, II and III)*



Valve body 76 SD (2¾ in.)
**027H6124**
***Table I***

Function module
ICS 65 **027H6200**
ICS 80 **027H8200**
***Table II***

Top cover 3 pilots
**027H6173**
***Table III***

*ICV 65 valve body w/different connections* — *Table I*

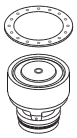


| 65 D (2½ in.) | 65 A (2½ in.) | 65 J (2½ in.) | 80 D (3 in.) |
|---|---|---|---|
| **027H6120** | **027H6121** | **027H6122** | **027H6126** |

| 80 A (3 in.) | 67 SA (2 ⅝ in.) | 76 SD (3 in.) | 65 SOC (2½ in.) |
|---|---|---|---|
| **027H6127** | **027H6125** | **027H6124** | **027H6123** |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ;
SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

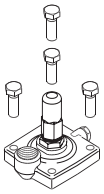
*ICS 65 and ICS 80 function module* — *Table II*



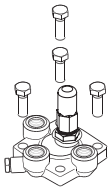
| Description | Code Number |
|---|---|
| ICS 65 | **027H6200** *) |
| ICS 80 | **027H8200** *) |

*) Including gasket and O-rings

*ICS 65/80 top cover* — *Table III*



ICS 1



ICS 3

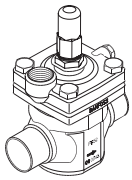
| Description | Code Number |
|---|---|
| Top cover 1 Pilot (65) | **027H6172** *) |
| Top cover 3 Pilots (65) | **027H6173** **) |
| Top cover 1 Pilot (80) | **027H8192** *) |
| Top cover 3 Pilots (80) | **027H8193** **) |

*) Including bolts
**) Including bolts and one blanking plug

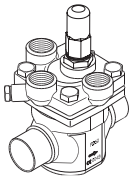
## Ordering complete factory assembled valve

*(body, function module and top cover)*

*Table A*



1 pilot



3 pilots

| | | Available connections | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 65 D (2½ in.) | 65 A (2½ in.) | 65 SOC (2½ in.) | 80 D (3 in.) | 80 A (3 in.) | 67 SA (2⅝ in.) | 76 SD (3 in.) | 65 J (2½ in.) |
| ICS 65 | 1 Pilot | **027H6020** | **027H6021** | **027H6023** | | | **027H6025** | **027H6024** | |
| | 3 Pilots *) | **027H6030** | **027H6031** | **027H6033** | | | **027H6035** | **027H6034** | |
| ICS 80 | 1 Pilot | | | | **027H8020** | **027H8021** | | | |
| | 3 Pilots *) | | | | **027H8030** | **027H8031** | | | |

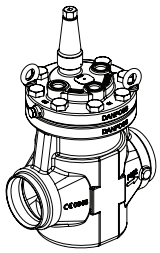
Select from parts programme

*) Including one blanking plug (A+B)

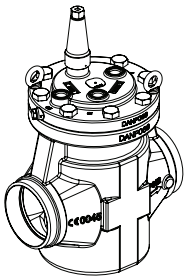
**Note:**
The capacity of the ICS 80 module can only be achieved when using the valve body with 80 D or A (3 in) connections.
If any other ICV 65 valve body is used the capacity of the complete valve will be reduced by approximately 6%.

# ICS 100 - 150

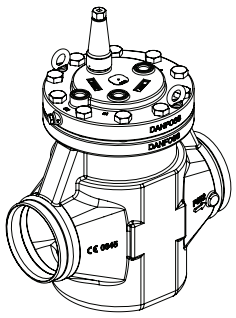
**Ordering complete factory assembled valve**
*(body, function module and top cover)*



| | Connections | | |
|---|---|---|---|
| | 100 D (4 in.) | 100 A (4 in.) | 100 A (4 in.) with ⅜ in. NPT pressure outlet |
| **ICS 100** *) | **027H7120** | **027H7121** | **027H7122** |



| | Connections | | |
|---|---|---|---|
| | 125 D (5 in.) | 125 A (5 in.) | 125 A (5 in.) with ⅜ in. NPT pressure outlet |
| **ICS 125** *) | **027H7140** | **027H7141** | **027H7142** |

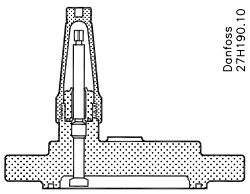


| | Connections | | |
|---|---|---|---|
| | 150 D (6 in.) | 150 A (6 in.) | 150 A (6 in.) with ⅜ in. NPT pressure outlet |
| **ICS 150** *) | **027H7160** | **027H7161** | **027H7162** |

*) Including two blanking plugs (A) and one sealing plug (B)

**Spare parts:** Please see AI245486497115

## Accessories

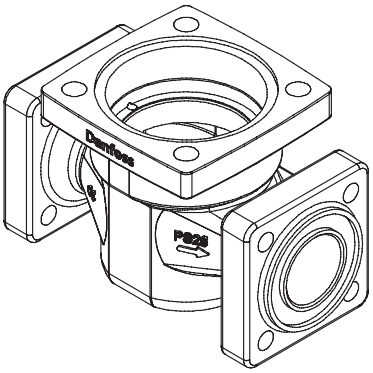



| Top covers | | |
|---|---|---|
| | Size | Code number |
| *Consist of:* Top cover complete with manuel spindle, and gasket | ICS 100 | **027H7123** |
| | ICS 125 | **027H7143** |
| | ICS 150 | **027H7163** |

## Accessories

*ICV PM flanged valve housings*
ICV PM flanged valve housings can replace the PM valves on already installed refrigeration systems.

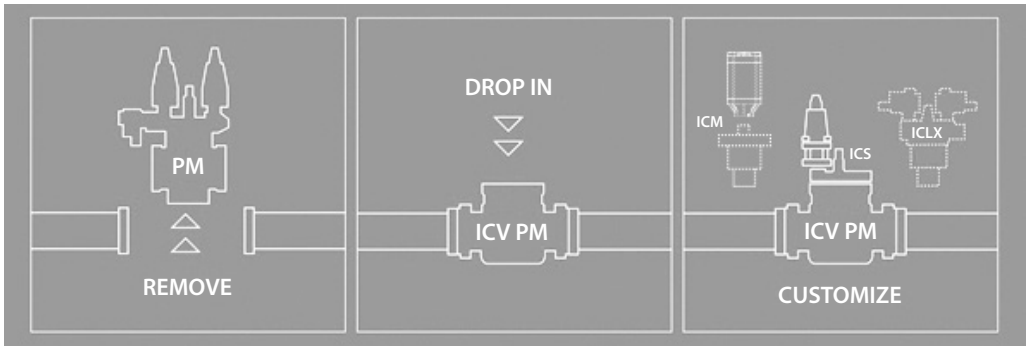
*Pressure range*
The ICV PM valve housing is designed for a max. working pressure of 28 bar g (406 psig) and therefore a suitable replacement for PM valves in the service market. They also offer the same drop-in dimensions as the PM valves.




| Description | Code no. |
|---|---|
| ICV 25 PM Valve housing | **027H2119** *) |
| ICV 32 PM Valve housing | **027H3129** *) |
| ICV 40 PM Valve housing | **027H4128** *) |
| ICV 50 PM Valve housing | **027H5127** **) |
| ICV 65 PM Valve housing | **027H6128** **) |

*) Includes ICV PM valve housing, flange gaskets and flange bolts.
**) Includes ICV PM valve housing, flange gaskets, flange bolts and flange nuts.

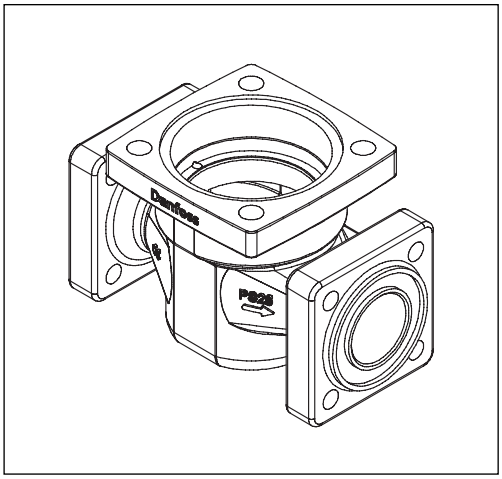
Function modules and top covers must be ordered separately (see the section "Ordering").



## Accessories

*ICV (H)A4A flanged valve housings*
ICV (H)A4A flanged valve housings can replace the (H)A4A valves on already installed refrigeration systems.

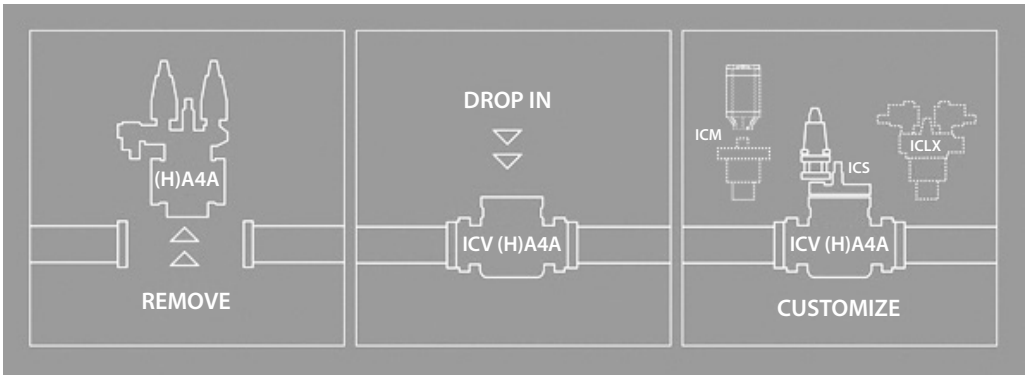
*Pressure range*
The ICV (H)A4A valve housing is designed for a max. working pressure of 28 bar g (406 psig) and therefore a suitable replacement for (H)A4A valves in the service market. They also offer the same drop-in dimensions as the (H)A4A valves.



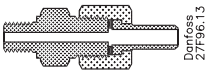
| Description | Code no. |
|---|---|
| ICV 25 (H)A4A Valve housing | **027H2304** *) |
| ICV 32 A4A Valve housing | **027H3130** *) |
| ICV 32 HA4A Valve housing | **027H3131** *) |
| ICV 40 (H)A4A Valve housing | **027H4129** *) |
| ICV 50 (H)A4A Valve housing | **027H5128** *) |
| ICV 65 (H)A4A Valve housing | **027H6129** *) |

*) Includes ICV (H)A4A valve housing, flange gaskets, flange bolts and flange nuts.

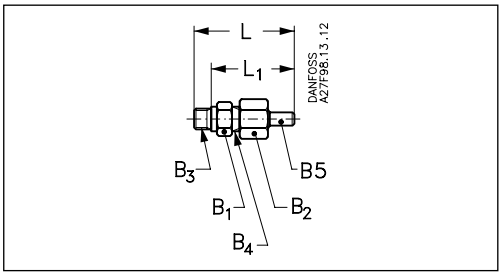
Function modules and top covers must be ordered separately (see the section "Ordering").




*Pressure gauge connection (weild / solder).*



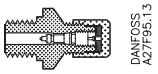

| Description | Code no. |
|---|---|
| ∅ 6.5 mm / ∅ 10 mm<br>(∅ 0.26 in. / ∅ 0.39 in.) weld / solder | **027B2035** |



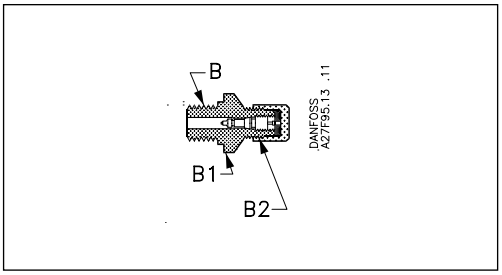

| Accessories | | L | $L_1$ | $B_1$ | $B_2$ | $B_3$ | $B_4$ | $B_5$ |
|---|---|---|---|---|---|---|---|---|
| *Pressure gauge connection (weld / solder)* | | | | | | | | |
| | mm<br>in. | 66<br>2.60 | 54<br>2.13 | AF 19 | AF 22 | G 1/4 A | G 3/4 A | ∅6.5 / ∅10 |

## Accessories
*(continued)*

*Pressure gauge connection, 1/4 in. flare (self-closing)*
*Must not be used in R 717 plant.*

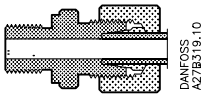



| Description | Code no. |
|---|---|
| ¼ in. flare | **027B2041** |

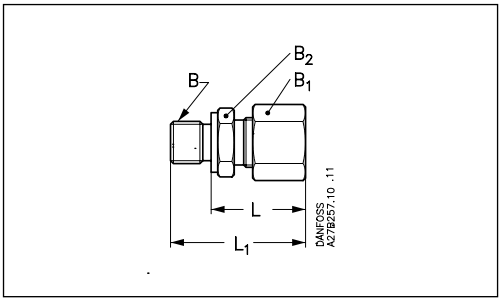



| Accessories | | | | | | B | $B_1$ | $B_2$ |
|---|---|---|---|---|---|---|---|---|
| *Pressure gauge connection, 1/4 in. flare (self-closing)* | | | | | | | | |
| ¼ in. flare | | | | | | G ¼ A | AF 19 | ¼ in. flare |

*Pressure gauge connection (cutting ring).*




| Description | Code no. |
|---|---|
| Cutting ring connection, 6 mm | **027B2063** |
| Cutting ring connection, 10 mm | **027B2064** |



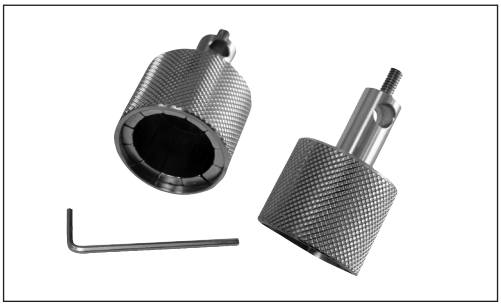

| Accessories | | | L | $L_1$ | | B | $B_1$ | $B_2$ |
|---|---|---|---|---|---|---|---|---|
| *Pressure gauge connection (cutting ring)* | | | | | | | | |
| 6 mm | mm<br>in. | | 27<br>1.06 | 39<br>1.54 | | G ¼ A | AF 19 | AF 14 |
| 10 mm | mm<br>in. | | 29<br>1.14 | 40<br>1.57 | | G ¼ A | AF 19 | AF 14 |

*Multi-function tool*

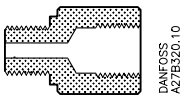
| Description | Code no. |
|---|---|
| Multi-function tool for ICS 25-65 | **027H0180 / 027H0181** |

The multi-funktion tool can be used for:
- Removing the ICS function module
- Operating the manual spindle

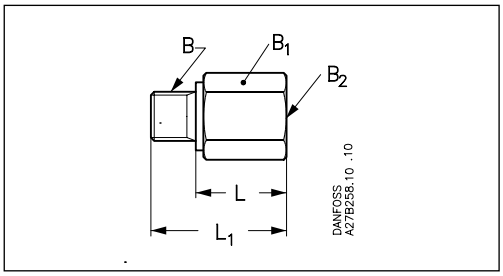
For further information please see the instruction PIHU0A.



*Pressure gauge connection.*



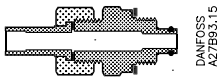

| Description | Code no. |
|---|---|
| 1/4 FPT | **027B2062** |



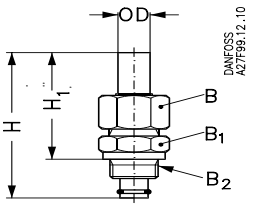

| Accessories | | | L | $L_1$ | | B | $B_1$ | $B_2$ |
|---|---|---|---|---|---|---|---|---|
| *Pressure gauge connection* | | | | | | | | |
| | mm<br>in. | | 23<br>0.91 | 35.5<br>1.40 | | G ¼ A | AF 22 | ¼ FPT |

## Accessories
*(continued)*

*External pilot connection.*




| ICS | Description | Code no. |
|---|---|---|
| 5 - 80 | External pilot connection (incl. damping orifice, D: 1.0 mm) | **027F1048** |
| 5 - 150 | Accessory bag with seal and O-ring for pilot valve | **027F0666** |
| 100 - 150 | External pilot connection (incl. damping orifice, D: 1.8 mm) | **027F1049** |

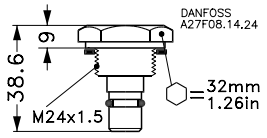



| Accessories | | | H | $H_1$ | OD | B | $B_1$ | $B_2$ |
|---|---|---|---|---|---|---|---|---|
| *External pilot connection* | | | | | | | | |
| | mm<br>in. | | 90<br>3.54 | 66<br>2.60 | 18<br>0.71 | AF 32 | AF 32 | M 24 × 1.5 |

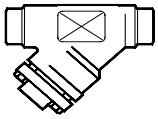
Blanking plug for pilot valves.



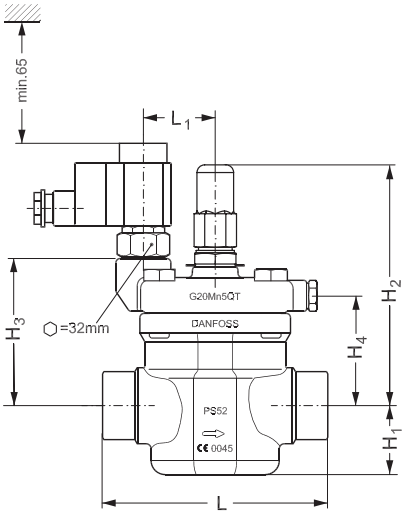
| Description | Code no. |
|---|---|
| Blanking plug | **027F1046** |



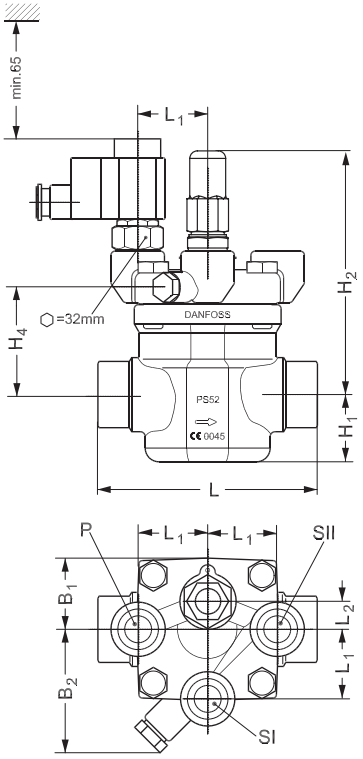

*Recommended filters*

| | Filter Type | Size | D | A | FPT | SOC | Filter element for liquid line: 150 mesh 100 my | Filter element for liquid line: 100 mesh 150 my | Filter element for suction line: 72 mesh 250 my | Filter element for suction line: 38 mesh 500 my |
|---|---|---|---|---|---|---|---|---|---|---|
|  | FIA Straightway | 20 (¾ in.) | **148B5343** | **148B5347** | **148B5349** | **148B5348** | **148H3122** | **148H3124** | **148H3126** | **148H3128** |
| | FIA Straightway | 25 (1 in.) | **148B5443** | **148B5447** | **148B5449** | **148B5448** | **148H3123** | **148H3125** | **148H3127** | **148H3129** |
| | FIA Straightway | 32 (1¼ in.) | **148B5544** | **148B5552** | **148B5549** | **148B5548** | **148H3123** | **148H3125** | **148H3127** | **148H3129** |
| | FIA Straightway | 40 (1½ in.) | **148B5625** | **148B5644** | | **148B5645** | **148H3123** | **148H3125** | **148H3127** | **148H3129** |
| | FIA Straightway | 50 (2 in.) | **148B5713** | **148B5716** | | **148B5717** | **148H3157** | **148H3130** | **148H3138** | **148H3144** |
| | FIA Straightway | 65 (2½ in.) | **148B5813** | **148B5815** | | | | **148H3131** | **148H3139** | **148H3145** |
| | FIA Straightway | 80 (3 in.) | **148B5906** | **148B5908** | | | | **148H3119** | **148H3120** | **148H3121** |
| | FIA Straightway | 100 (4 in.) | **148B6007** | **148B6009** | | | | **148H3132** | **148H3140** | **148H3146** |
| | FIA Straightway | 125 (5 in.) | **148B6106** | **148B6108** | | | | **148H3133** | **148H3141** | **148H3147** |
| | FIA Straightway | 150 (6 in.) | **148B6203** | **148B6205** | | | | **148H3134** | **148H3142** | **148H3148** |

## Dimensions and weights - ICS 25-5 to ICS 25-25




ICS 1 pilot

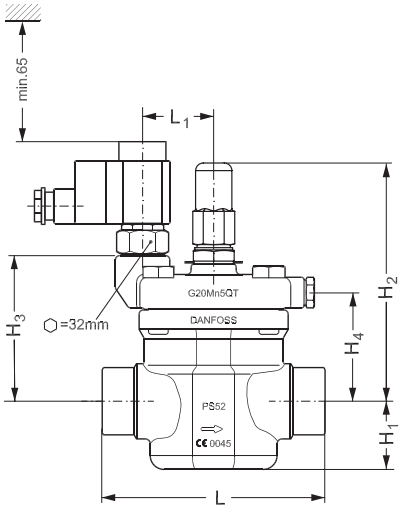



ICS 3 Pilots

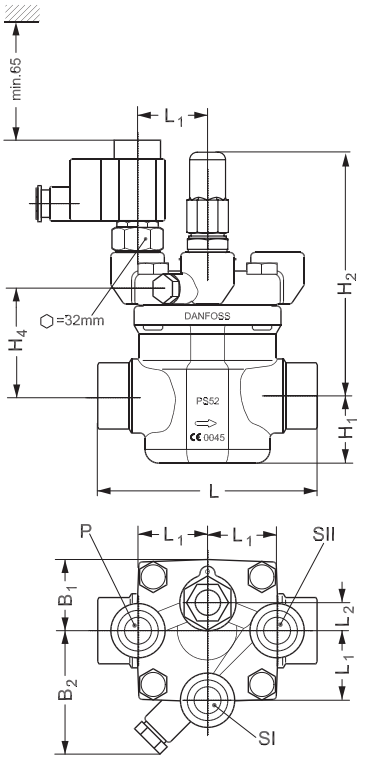
| Connection | | $H_1$ | $H_2$ | $H_3$ | $H_4$ | L | $L_1$ | $L_2$ | $B_1$ | $B_2$ | Weight ICS 1 Pilot | Weight ICS 3 Pilots |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 D (¾ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 25 D (1 in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 32 D (1¼ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 40 D (1½ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 20 A (¾ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 25 A (1 in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 32 A (1¼ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 20 SOC (¾ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 25 SOC (1 in.) | mm | 37 | 145 | 86 | 60 | 147 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.79 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 22 SD (⅞ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 28 SD (1⅛ in.) | mm | 37 | 145 | 86 | 60 | 147 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.78 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 22 SA (⅞ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 28 SA (1⅛ in.) | mm | 37 | 145 | 86 | 60 | 147 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.78 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 35 SA (1⅜ in.) | mm | 37 | 145 | 86 | 60 | 147 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.78 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 20 FPT (¾ in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |
| 25 FPT (1 in.) | mm | 37 | 145 | 86 | 60 | 135 | 42 | 15 | 42 | 87 | 3 kg | 3.6 kg |
| | in. | 1.46 | 5.71 | 3.39 | 2.36 | 5.31 | 1.65 | 0.59 | 1.65 | 3.43 | 6.6 lb. | 7.92 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ; SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

## Dimensions and weights - ICS 32




*ICS 1 pilot*

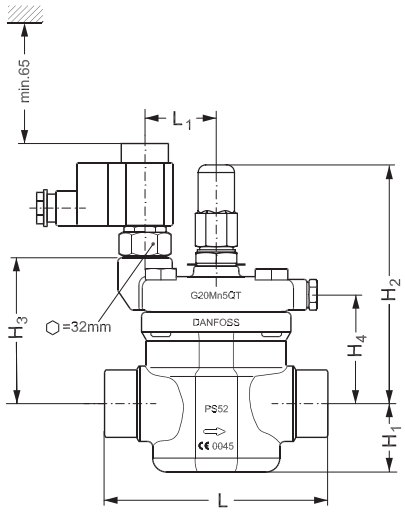



*ICS 3 Pilots*

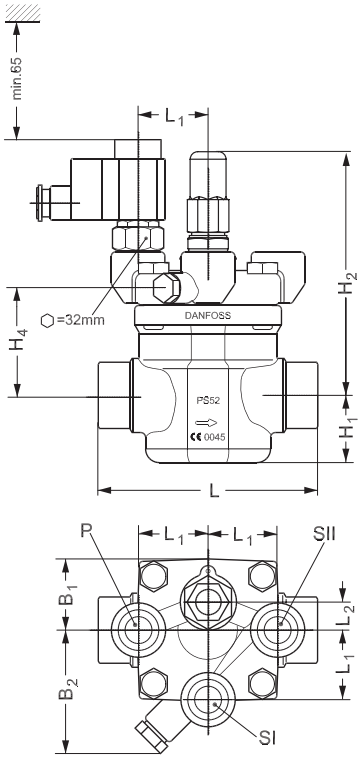
| Connection | | $H_1$ | $H_2$ | $H_3$ | $H_4$ | L | $L_1$ | $L_2$ | $B_1$ | $B_2$ | Weight ICS 1 Pilot | Weight ICS 3 Pilots |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 D (1¼ in.) | mm | 40 | 160 | 100 | 74 | 145 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.71 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 40 D (1½ in.) | mm | 40 | 160 | 100 | 74 | 145 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.71 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 32 A (1¼ in.) | mm | 40 | 160 | 100 | 74 | 145 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.71 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 40 A (1½ in.) | mm | 40 | 160 | 100 | 74 | 145 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.71 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 32 SOC (1¼ in.) | mm | 40 | 160 | 100 | 74 | 148 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.83 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 35 SD (1⅜ in. SA) | mm | 40 | 160 | 100 | 74 | 148 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.83 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 42 SD (1⅝ in.) | mm | 40 | 160 | 100 | 74 | 148 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.83 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |
| 42 SA (1⅝ in.) | mm | 40 | 160 | 100 | 74 | 148 | 51 | 15 | 51 | 87 | 4.5 kg | 5 kg |
| | in. | 1.57 | 6.30 | 3.93 | 2.91 | 5.83 | 2.00 | 0.59 | 2.00 | 3.43 | 9.9 lb. | 11 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ; SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

## Dimensions and weights - ICS 40




*ICS 1 pilot*

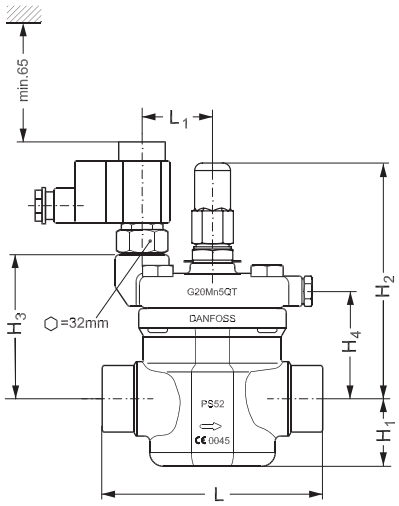



*ICS 3 Pilots*

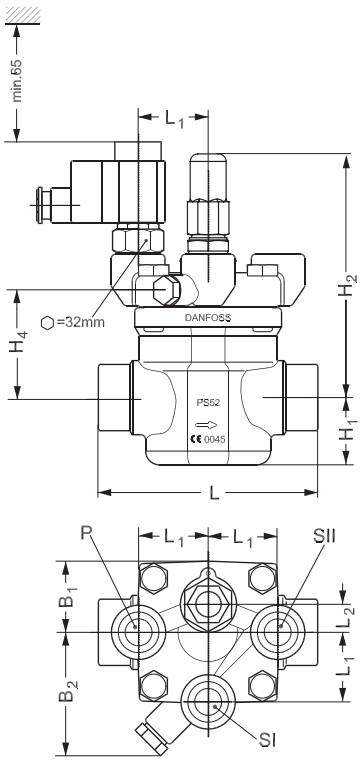
| Connection | | $H_1$ | $H_2$ | $H_3$ | $H_4$ | L | $L_1$ | $L_2$ | $B_1$ | $B_2$ | Weight ICS 1 Pilot | Weight ICS 3 Pilots |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 D (1½ in.) | mm | 49 | 166 | 105 | 78 | 160 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 6.30 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |
| 50 D (2 in. ) | mm | 49 | 166 | 105 | 78 | 180 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 7.09 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |
| 40 A (1½ in.) | mm | 49 | 166 | 105 | 78 | 160 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 6.30 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |
| 50 A (2 in.) | mm | 49 | 166 | 105 | 78 | 180 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 7.09 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |
| 40 SOC (1½ in.) | mm | 49 | 166 | 105 | 78 | 180 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 7.09 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |
| 42 SD (1⅝ in.) | mm | 49 | 166 | 105 | 78 | 180 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 7.09 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |
| 42 SA (1⅝ in.) | mm | 49 | 166 | 105 | 78 | 180 | 51 | 15 | 54 | 87 | 5.9 kg | 6.3 kg |
| | in. | 1.93 | 6.54 | 4.13 | 3.07 | 7.09 | 2.00 | 0.59 | 2.13 | 3.43 | 13.0 lb. | 13.9 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ; SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

## Dimensions and weights - ICS 50




*ICS 1 pilot*

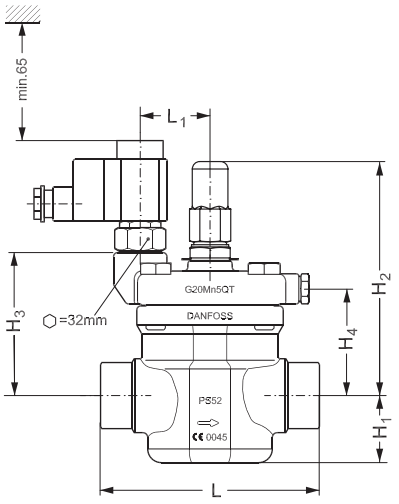



*ICS 3 Pilots*

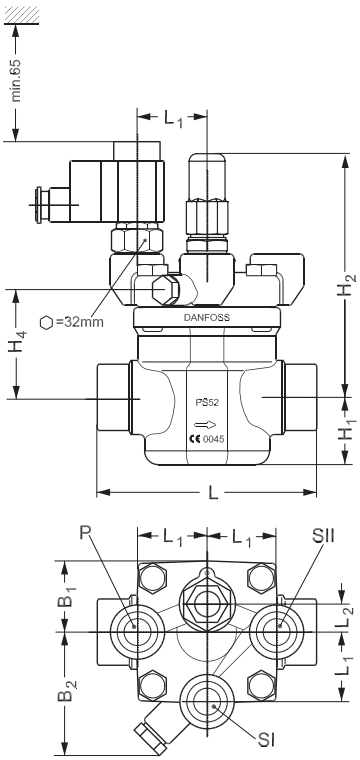
| Connection | | $H_1$ | $H_2$ | $H_3$ | $H_4$ | L | $L_1$ | $L_2$ | $B_1$ | $B_2$ | Weight ICS 1 Pilot | Weight ICS 3 Pilots |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 D (2 in.) | mm | 59 | 181 | 120 | 93 | 200 | 51 | 15 | 63 | 91 | 8.9 kg | 9.2 kg |
| | in. | 2.32 | 7.13 | 4.72 | 3.66 | 7.87 | 2.00 | 0.59 | 2.48 | 3.58 | 19.6 lb. | 20.2 lb. |
| 65 D (2½ in.) | mm | 59 | 181 | 120 | 93 | 210 | 51 | 15 | 63 | 91 | 8.9 kg | 9.2 kg |
| | in. | 2.32 | 7.13 | 4.72 | 3.66 | 8.27 | 2.00 | 0.59 | 2.48 | 3.58 | 19.6 lb. | 20.2 lb. |
| 50 A (2 in.) | mm | 59 | 181 | 120 | 93 | 200 | 51 | 15 | 63 | 91 | 8.9 kg | 9.2 kg |
| | in. | 2.32 | 7.13 | 4.72 | 3.66 | 7.87 | 2.00 | 0.59 | 2.48 | 3.58 | 19.6 lb. | 20.2 lb. |
| 65 A (2½ in.) | mm | 59 | 181 | 120 | 93 | 210 | 51 | 15 | 63 | 91 | 8.9 kg | 9.2 kg |
| | in. | 2.32 | 7.13 | 4.72 | 3.66 | 8.27 | 2.00 | 0.59 | 2.48 | 3.58 | 19.6 lb. | 20.2 lb. |
| 50 SOC (2 in.) | mm | 59 | 181 | 120 | 93 | 216 | 51 | 15 | 63 | 91 | 8.9 kg | 9.2 kg |
| | in. | 2.32 | 7.13 | 4.72 | 3.66 | 8.50 | 2.00 | 0.59 | 2.48 | 3.58 | 19.6 lb. | 20.2 lb. |
| 54 SD (2⅛ in. SA) | mm | 59 | 181 | 120 | 93 | 216 | 51 | 15 | 63 | 91 | 8.9 kg | 9.2 kg |
| | in. | 2.32 | 7.13 | 4.72 | 3.66 | 8.50 | 2.00 | 0.59 | 2.48 | 3.58 | 19.6 lb. | 20.2 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ; SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

## Dimensions and weights - ICS 65/ ICS 80




*ICS 1 pilot*

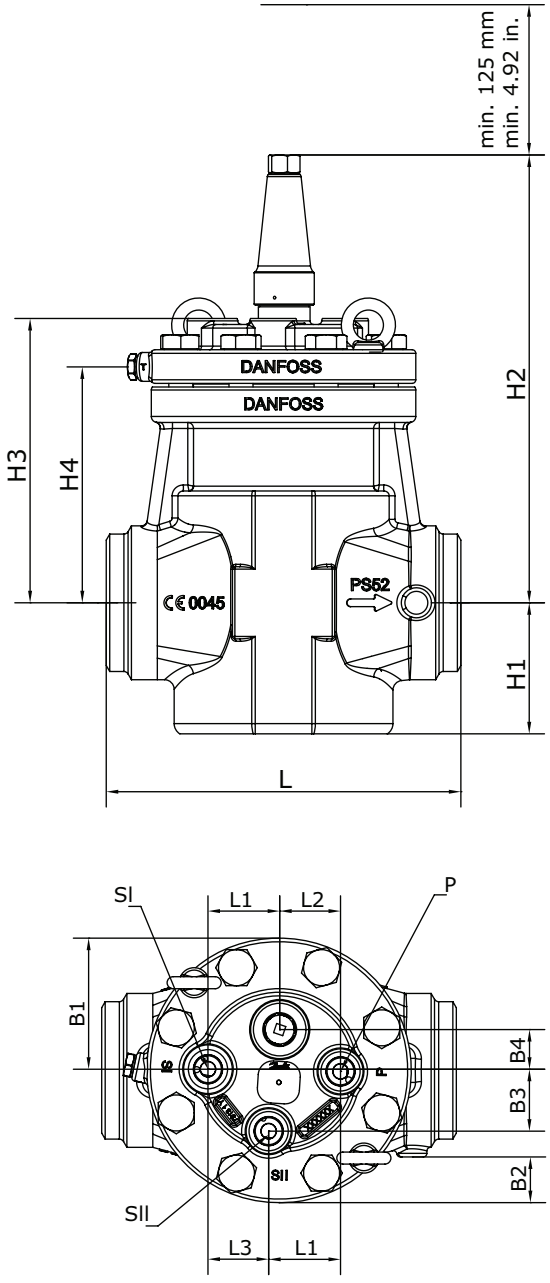



*ICS 3 Pilots*

| Connection | | $H_1$ | $H_2$ | $H_3$ | $H_4$ | L | $L_1$ | $L_2$ | $B_1$ | $B_2$ | Weight ICS 1 Pilot | Weight ICS 3 Pilots |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 D (2½ in.) | mm | 65 | 202 | 140 | 115 | 230 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.06 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 80 D (3 in.) | mm | 65 | 202 | 140 | 115 | 245 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.65 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 65 A (2½ in.) | mm | 65 | 202 | 140 | 115 | 230 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.06 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 80 A (3 in.) | mm | 65 | 202 | 140 | 115 | 245 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.65 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 65 J (2½ in.) | mm | 65 | 202 | 140 | 115 | 230 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.06 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 65 SOC (2½ in.) | mm | 65 | 202 | 140 | 115 | 230 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.06 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 76 SD (3 in.) | mm | 65 | 202 | 140 | 115 | 245 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.65 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |
| 67 SA (2⅝ in.) | mm | 65 | 202 | 140 | 115 | 245 | 51 | 15 | 70 | 91 | 13.4 kg | 13.5 kg |
| | in. | 2.56 | 7.95 | 5.51 | 4.53 | 9.65 | 2.00 | 0.59 | 2.76 | 3.58 | 29.48 lb. | 29.7 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI ; J = Butt-weld JIS ; SOC = Socket weld ANSI ; SD = Solder DIN ; SA = Solder ANSI ; FPT = Female Pipe Thread

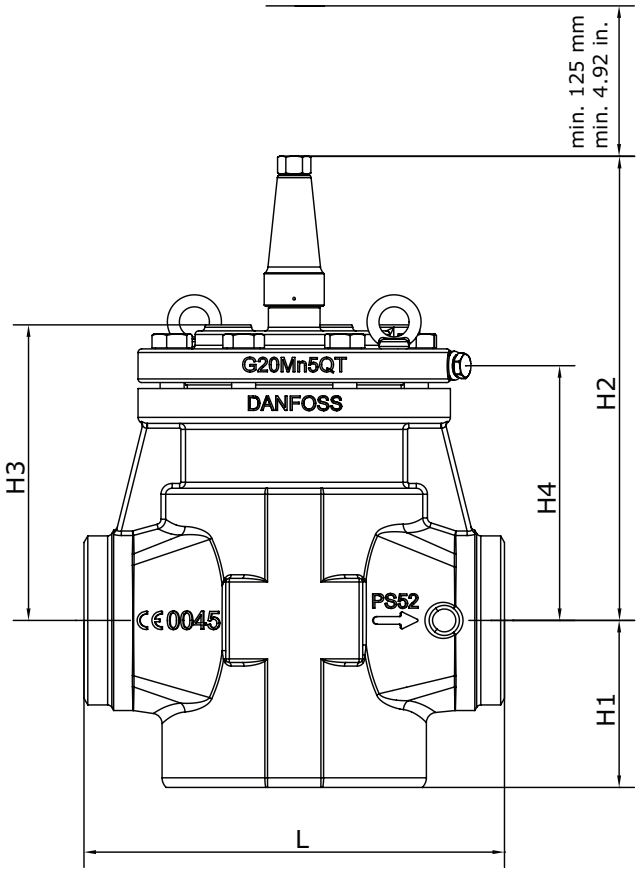
## Dimensions and weights - ICS 100

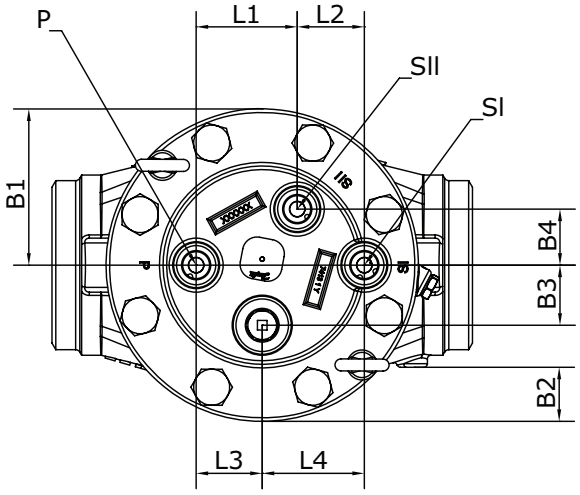



| Connection | | H1 | H2 | H3 | H4 | L | L1 | L2 | L3 | B1 | B2 | B3 | B4 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 D or A (4 in.) | mm | 109 | 372 | 237 | 196 | 295 | 60 | 51 | 50 | 109 | 38 | 52 | 33 | 45 kg |
| | in. | 4.3 | 14.7 | 9.3 | 7.7 | 11.6 | 2.4 | 2.0 | 2.0 | 4.3 | 1.5 | 2.1 | 1.3 | 99.2 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI

## Dimensions and weights - ICS 125

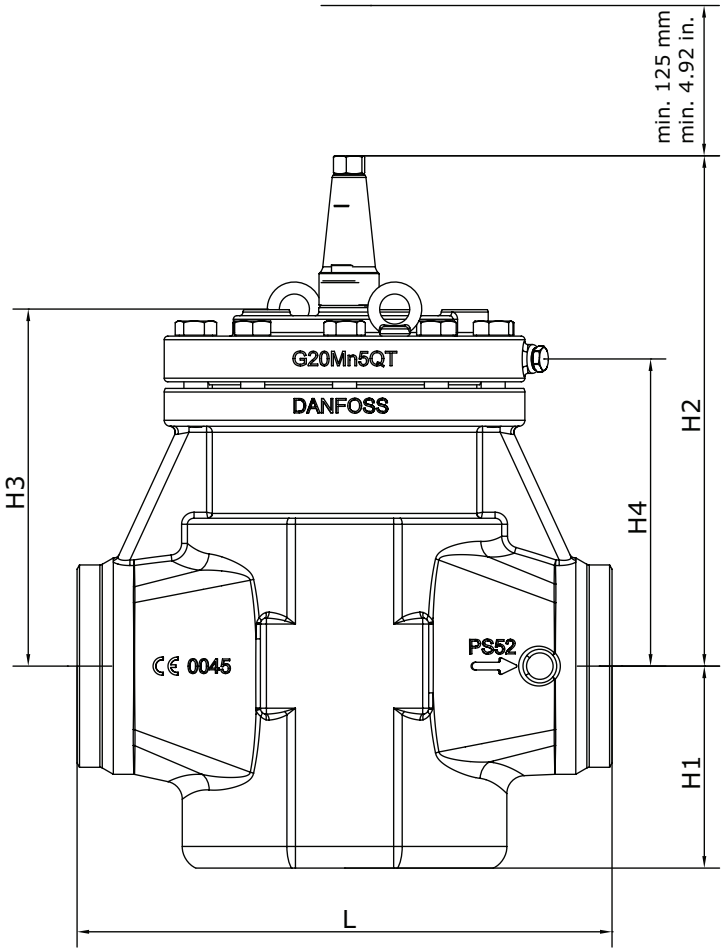


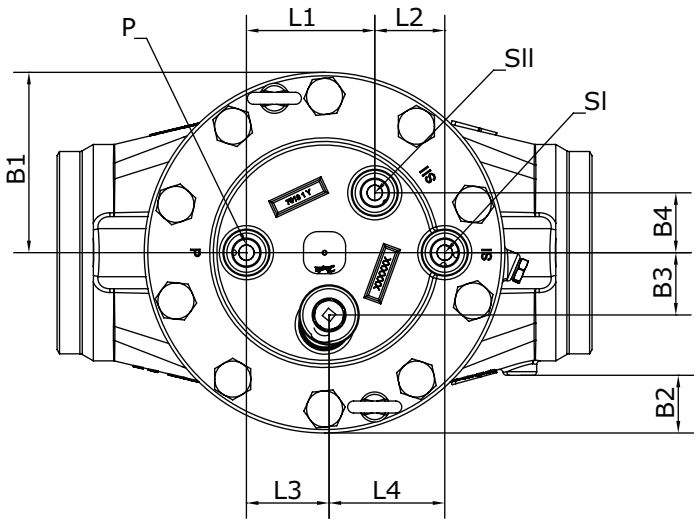




| Connection | | H1 | H2 | H3 | H4 | L | L1 | L2 | L3 | L4 | B1 | B2 | B3 | B4 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 125 D or A (5 in.) | mm | 139 | 386 | 246 | 212 | 350 | 84 | 56 | 55 | 85 | 130 | 45 | 50 | 47 | 68 kg |
| | in. | 5.5 | 15.2 | 9.7 | 8.4 | 13.8 | 3.3 | 2.2 | 2.2 | 3.4 | 5.1 | 1.8 | 2.0 | 1.9 | 149.9 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI

## Dimensions and weights - ICS 150



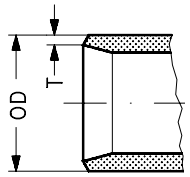




| Connection | | H1 | H2 | H3 | H4 | L | L1 | L2 | L3 | L4 | B1 | B2 | B3 | B4 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 150 D or A (6 in.) | mm | 168 | 425 | 297 | 256 | 445 | 107 | 58 | 69 | 96 | 150 | 48 | 52 | 50 | 115 kg |
| | in. | 6.6 | 16.7 | 11.7 | 10.1 | 17.5 | 4.2 | 2.3 | 2.7 | 3.8 | 5.9 | 1.9 | 2.1 | 2.0 | 253.5 lb. |

D = Butt-weld DIN ; A = Butt-weld ANSI

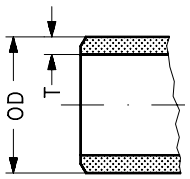
## Connections

D: *Butt-weld DIN (2448)*



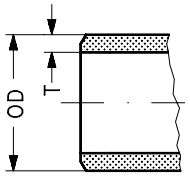

| Size mm | Size in. | OD mm | T mm | OD in. | T in. | | |
|---|---|---|---|---|---|---|---|
| 20 | (¾) | 26.9 | 2.3 | 1.059 | 0.091 | | |
| 25 | (1) | 33.7 | 2.6 | 1.327 | 0.103 | | |
| 32 | (1¼) | 42.4 | 2.6 | 1.669 | 0.102 | | |
| 40 | (1½) | 48.3 | 2.6 | 1.902 | 0.103 | | |
| 50 | (2) | 60.3 | 2.9 | 2.37 | 0.11 | | |
| 65 | (2½) | 76.1 | 2.9 | 3 | 0.11 | | |
| 80 | (3) | 88.9 | 3.2 | 3.50 | 0.13 | | |
| 100 | (4) | 114.3 | 3.6 | 4.5 | 0.14 | | |
| 125 | (5) | 140.7 | 4 | 5.5 | 0.16 | | |
| 150 | (6) | 168.3 | 6.3 | 6.6 | 0.25 | | |

A: *Butt-weld ANSI (B 36.10)*



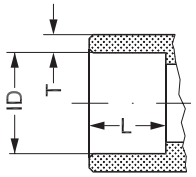

| Size mm | Size in. | OD mm | T mm | OD in. | T in. | Schedule | |
|---|---|---|---|---|---|---|---|
| (20) | ¾ | 26.9 | 4.0 | 1.059 | 0.158 | 80 | |
| (25) | 1 | 33.7 | 4.6 | 1.327 | 0.181 | 80 | |
| (32) | 1¼ | 42.4 | 4.9 | 1.669 | 0.193 | 80 | |
| (40) | 1½ | 48.3 | 5.1 | 1.902 | 0.201 | 80 | |
| (50) | 2 | 60.3 | 3.9 | 2.37 | 0.15 | 40 | |
| (65) | 2½ | 73.0 | 5.2 | 2.87 | 0.20 | 40 | |
| (80) | 3 | 88.9 | 5.5 | 3.50 | 0.22 | 40 | |
| (100) | 4 | 114.3 | 6 | 4.5 | 0.24 | | |
| (125) | 5 | 140.7 | 6.5 | 5.5 | 0.26 | | |
| (150) | 6 | 168.3 | 7.1 | 6.6 | 0.28 | | |

J: *Butt-weld JIS*



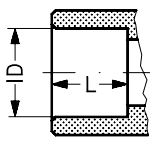

| Size mm | Size in. | OD mm | T mm | OD in. | T in. | | |
|---|---|---|---|---|---|---|---|
| (20) | ¾ | 26.9 | 4.0 | 1.059 | 0.158 | | |
| (25) | 1 | 33.7 | 4.6 | 1.327 | 0.181 | | |
| (32) | 1¼ | 42.4 | 4.9 | 1.669 | 0.193 | | |
| (40) | 1½ | 48.3 | 5.1 | 1.902 | 0.201 | | |
| (50) | 2 | 60.3 | 3.9 | 2.37 | 0.15 | | |
| (65) | 2½ | 76.3 | 5.2 | 3.0 | 0.20 | | |

SOC:
*Socket welding ANSI (B 16.11)*




| Size mm | Size in. | ID mm | T mm | ID in. | T in. | L mm | L in. |
|---|---|---|---|---|---|---|---|
| (20) | ¾ | 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) | 1¼ | 42.7 | 6.1 | 1.743 | 0.240 | 13 | 0.51 |
| (40) | 1½ | 48.8 | 6.6 | 1.921 | 0.260 | 13 | 0.51 |
| (50) | 2 | 61.2 | 6.2 | 2.41 | 0.24 | 16 | 0.63 |
| (65) | 2½ | 74 | 8.8 | 2.91 | 0.344 | 16 | 0.63 |

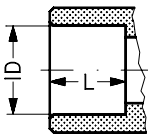
SD: *Soldering (DIN 2856)*




| Size mm | Size in. | ID mm | | ID in. | | L mm | L in. |
|---|---|---|---|---|---|---|---|
| 22 | | 22.08 | | | | 16.5 | |
| 28 | | 28.08 | | | | 26 | |
| 35 | | 35.07 | | | | 25 | |
| 42 | | 42.07 | | | | 28 | |
| 54 | | 54.09 | | | | 33 | |
| 76 | | 76.1 | | | | 33 | |

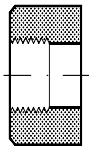
**Connections** *(continued)*

SA: Soldering (ANSI B 16.22)




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ⅞ | | | 0.875 | | | 0.650 |
| | 1⅛ | | | 1.125 | | | 1.024 |
| | 1⅜ | | | 1.375 | | | 0.984 |
| | 1⅝ | | | 1.625 | | | 1.102 |
| | 2⅛ | | | 2.125 | | | 1.300 |
| | 2⅝ | | | 2.625 | | | 1.300 |

FPT:
Female pipe thread,
*(ANSI/ASME B 1.20.1)*



| Size mm | Size in. | Inside pipe thread | | |
|---|---|---|---|---|
| (20) | ¾ | ($^3/_4$ × 14 NPT) | | |
| (25) | 1 | (1 × 11.5 NPT) | | |
| (32) | 1¼ | ($1^1/_4$ × 11.5 NPT) | | |

ENGINEERING
TOMORROW

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed.
All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.