

READY  
-TO-INSTALL  
**CO<sub>2</sub>**  
IC SOLUTIONS

# CO<sub>2</sub> SOLUTIONS

FOR REMOTE COOLING SYSTEMS



UPRIGHT  
STORAGE  
CABINETS



STORAGE  
COUNTERS



BLAST CHILLERS/  
FREEZERS



**HOSHIZAKI**

**GRAM**



A portrait of Rasmus Munk, a man with short brown hair and a beard, wearing a blue button-down shirt. He is looking directly at the camera with a neutral expression. The background is a plain, light-colored wall.

*Rasmus Munk*

Co-owner & head Chef

Restaurant Alchemist, Copenhagen

"AS A CHEF I HAVE THE RESPONSIBILITY TO CHOOSE MY EQUIPMENT AND MACHINES WITH THE SAME CARE AND FOCUS AS WHEN I SELECT MY VEGETABLES, FISH AND MEAT. HAVING THE LATEST, SMARTEST AND MOST ENERGY-EFFICIENT TECHNOLOGY IN OUR KITCHENS MAKES A HUGE IMPACT ON OUR CO<sub>2</sub> FOOTPRINT AND OUR PARTNERSHIP WITH HOSHIZAKI-GRAM CONTRIBUTES A GREAT AMOUNT TO THAT EQUATION".





"MOST IMPORTANT FOR US IS TO EASE THE JOB OF THE COOLING ENGINEER. THIS GOES FROM PRE-PLANNING OVER UNCOMPLICATED INSTALLATION TO EASY MAINTENANCE AND AFTERSALES SERVICE. PROBABLY OUR GRAM IC SOLUTIONS ARE AS CLOSE TO **PLUG AND PLAY** AS IT GETS".

*Flemming Tind Velling*  
Product Manager at Hoshizaki-Gram

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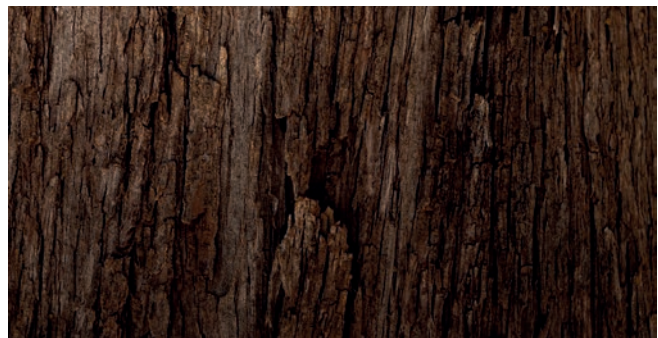
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# CO<sub>2</sub>, THE NATURAL REFRIGERANT OF TODAY AND TOMORROW

## GET READY FOR FUTURE-PROOF REFRIGERANTS

CO<sub>2</sub> has become increasingly popular worldwide, proving to be one of the most reliable, efficient and environmentally friendly refrigerants. In northern countries with lower ambient temperatures, remote CO<sub>2</sub> solutions are often more sustainable and provide higher energy efficiency.



## BAN ON HIGH GWP REFRIGERANTS

From 1st January 2020 the EU F-gas regulation bans the sale of new refrigeration equipment that use F-gasses with a Global Warming Potential (GWP) of 2500 or above.

The next phase down that takes effect 1st January 2022 bans refrigerants with a GWP above 150.

## REFRIGERANTS AND THEIR PROPERTIES

|                                     | R-134a   | R404A    | CO <sub>2</sub> | HFOs   | R290 | R600a |
|-------------------------------------|----------|----------|-----------------|--------|------|-------|
| Natural substance                   | NO       | NO       | YES             | NO     | YES  | YES   |
| Ozone Depletion Potential (ODP)     | 0        | 0        | 0               | 0      | 0    | 0     |
| Global Warming Potential (GWP)      | 1430     | 3922     | 1               | <150   | 3    | 3     |
| Flammable                           | NO       | NO       | NO              | MILDLY | YES  | YES   |
| Phase out due to F-gas regulation   | 1/1-2022 | 1/1-2020 | N/A             | N/A    | N/A  | N/A   |
| Applicable for remote installations | YES      | YES      | YES             | YES    | NO*  | NO*   |

\*Only currently allowed in some countries for small remote DX installations. High skill level and safety level needed.



# SUPERIOR CO<sub>2</sub> PROPERTIES - IMPORTANT ADVANTAGES

## POSITIVE CLIMATE IMPACT

CO<sub>2</sub> is a natural substance that plays an important role in many natural and industrial processes. However, the most widely used refrigerants in commercial refrigeration today are HFCs. Compared to CO<sub>2</sub>, the GWP of HFC is up to 4000 times higher.

Therefore replacing HFCs with CO<sub>2</sub> accelerates a positive climate impact, also due to the fact that traditional remote cooling systems often leak a considerable part of their refrigerant charge, resulting in harmful gas escaping into the atmosphere.

## NATURAL EFFICIENCY PAIRED WITH COST SAVINGS

With high volumetric efficiency, low power consumption and a reduced refrigerant charge, CO<sub>2</sub> cooling systems offer low cost of ownership.

By replacing a HFC system with a CO<sub>2</sub> based system, studies show a 20% energy saving potential.

## CREATING A PLEASANT WORKING ENVIRONMENT

With a remote cooling system, noise and heat emission occurs outside of the typical working area, which helps to create a comfortable working environment.

## CO<sub>2</sub> CENTRAL COOLING SYSTEMS ARE IDEAL FOR:



# GRAM CO<sub>2</sub> STORAGE SOLUTIONS GET MORE & SAVE TIME

## IC – INTEGRATED CONTROLLER SOLUTIONS

Ready-to-install upright cabinets and blast chiller with factory fitted controller



### UPRIGHT CABINETS & BLAST CHILLER KPS 60

Degree of completion:

#### Upright cabinets

Integrated controllers available are Danfoss AKCC 550A or Carel MPXPro

#### KPS 60 BLAST CHILLER

The master controller is the standard Gram blast chiller controller. The slave controller is a fitted Carel super heat controller.

IC solutions are ready-to-install solutions that come very close to 'plug and play'. They come with factory fitted controller solutions and are prepared for fast pipe connection.

## VC – VARIABLE CONTROLLER SOLUTIONS

Upright cabinets for easy integration of installer's preferred controller



### UPRIGHT CABINETS

Degree of completion:

The VC range allows for easy integration of your own preferred controller. It does not include factory fitted controller or pressure transmitter. These are the installer's choice. Combine this product with a controller from alternative controller manufacturers.

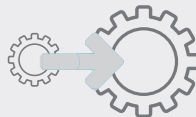
Standard controller display cut-out, size H29 x W71 mm. Customized controller display cut-out in the control box available on request. Internal wiring done and ends in a connection plinth inside the controller box.

## INTEGRATED OR WITHOUT FACTORY FITTED CONTROLLER



### EASY PRE-PLANNING

Easy pre-planning with detailed documentation offering wiring and piping diagrams as well as technical installation manuals.



### EASY TO INTEGRATE

Uncomplicated to include in a refrigeration system thanks to our comprehensive documentation and easy pipe connections.



### EASY INSTALLATION

The market standard today has a low degree of completion which leaves a lot of work to the installer. With our solutions the degree of completion depends on the controller choice.



## PIC – PARTLY INTEGRATED CONTROLLER SOLUTIONS

Blast chillers and blast freezers with factory fitted master controller, but without slave controller



KPS 42, KPS 120, KPS 180

Degree of completion:

Master controller: Gram

The PIC range comes with factory fitted master controller and allows for integration of your own preferred slave controller. Combine this product with the super heat controller of your choice. Super heat controller, expansion valve and coil, pressure transmitter, super heat sensor etc. are not included.

## KD – KNOCKDOWN

Counters without controller and controller box.



COUNTERS

Degree of completion:

Comes with factory fitted sensors PT 1000 (labelled according to Danfoss) and pressure tested evaporator.

Control box, controller, electronic expansion valve, pressure transmitter and external wiring to be provided, connected and built by the installation company.

All internal wiring ends in the empty compressor compartment. Standard controller display cut-out, size H29 x W71 mm. Customised controller display cut-out in the control panel available on request.



### EASY EXTERNAL MONITORING

Prepared for easy external monitoring (*Danfoss and Carel controller*). This is optional and provided by cooling contractor.



### QUICK TECHNICAL SUPPORT

Preventive service measures as well as quick and responsive technical support thanks to external monitoring.<sup>1</sup> This presupposes that the controller is connected.



### EASY MAINTENANCE

With external monitoring it is possible to conduct preventive and cost saving service on your GRAM CO<sub>2</sub> products.<sup>1</sup> This presupposes that the controller is connected.

IC

IC

IC

<sup>1</sup> Provided by cooling contractor



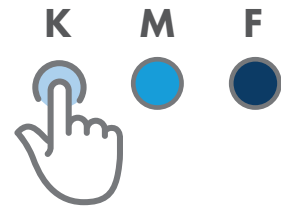
# ULTIMATE FLEXIBILITY WITH GRAM CO<sub>2</sub>



## ULTIMATE FLEXIBILITY WITH 'U' TYPE CABINETS

The **GRAM ECO** range with its **PLUS, TWIN, EURO** and **MIDI** series offers the ultimate flexibility.

All models **with an insulated door** are defined as **U-type** cabinets. As default they come as freezers but the controller can be set to run as a refrigerator with K or M temperature range. This means it can be decided at site what purpose the cabinet has to serve. The cabinet is then set to suit the refrigeration system that it is connected to.



This provides maximum flexibility at time of installation.

| K<br>+2/+12°C | M<br>-5/+12°C      | F<br>-25/-5°C |
|---------------|--------------------|---------------|
| Refrigerator  | Fresh meat cabinet | Freezer       |

*Default setting* (arrow pointing to M)

## GRAM STORAGE CABINETS, MODEL OVERVIEW AND SPECIFICATIONS:

|  | ECO PLUS 70         | ECO TWIN 82 | ECO EURO 60 | ECO MIDI 82 |
|--|---------------------|-------------|-------------|-------------|
| U models: Insulated door                         | ●                   | ●           | ●           | ●           |
| KG models: Glass door refrigerator (+2 to +12°C) | ●                   | ●           | ●           | ●           |
| FG models: Glass door freezer (-5 to -20°C)      | ●                   | ●           | ●           | ●           |
| Standard shelf sizes                             | 2/1 GN Deep         | 2/1 GN Wide | 40 x 60 cm  | 2/1 GN Wide |
| Material: Exterior / Interior                    | Stainless/Stainless |             |             |             |
| Connection                                       | 230V/50Hz           |             |             |             |
| Pipe connection: Liquid / Suction                | 3/8" / 3/8"         |             |             |             |
| Re-evaporation of defrost water *                | Yes                 |             |             |             |
| Orifice in AKVP valve                            | 10-1                |             |             |             |

● available ● not available

\* The electrical re-evaporation system is easy to remove if the defrost water pipe can be connected to an external drain (recommended if possible). As a positive side effect this will also lower the energy consumption.





**OUR SOLUTIONS  
- SERIES BY SERIES**

# IC - INTEGRATED CONTROLLER SOLUTIONS



## GRAM ECO Cabinets - Ready-to-install

### READY TO INSTALL SOLUTIONS

*IC solutions have the highest degree of completion and are as close to plug and play as it gets.*

Degree of completion

Upright storage series **PLUS** **TWIN** **EURO** **MIDI 82**

**Controller options.**  
Parameters are pre-set in factory

|                      |                 |
|----------------------|-----------------|
| Danfoss<br>AKCC 550A | Carel<br>MPXPro |
|----------------------|-----------------|

#### PACKAGE INCLUDES

|  |            |            |
|--|------------|------------|
| Pressure tested evaporator PS 60 bar<br><i>Pressure test documentation supplied.</i>   | <b>Yes</b> | <b>Yes</b> |
| Sensors, 3 pcs PT 1000. for:<br>Room, Evaporator, Superheat  | <b>Yes</b> | <b>Yes</b> |
| Electrical box mounted with pre-programmed DIN<br>controller. Electrical components are all connected<br>inside the controller box (EMC & LVD tested). | <b>Yes</b> | <b>Yes</b> |
| Injection valve (AKVP with EEV coil) for maximum<br>opening torque   | <b>Yes</b> | <b>Yes</b> |
| Re-evaporation of defrost water.<br><i>(connection to external drain is optional)</i>  | <b>Yes</b> | <b>Yes</b> |
| Pressure transmitter (0-45 bar gauge)  | <b>Yes</b> | <b>Yes</b> |

#### EXTENDED OPTIONS *(not factory fitted) \**

|            |   |                |
|------------|---|----------------|
| Monitoring | Yes, through<br>DanBus and more.<br>Additional LON<br>Card not included | Yes, by RS 485 |
|------------|---|----------------|

\* This options can be considered at the site of installation. Installation by cooling contractor.

### SERIES LINE-UP



ECO PLUS



ECO TWIN



ECO EURO



ECO MIDI 82






# KD - KNOCKDOWN SOLUTIONS



## GRAM GASTRO counters

Degree of completion 

Counter series

**GASTRO 07**

1407

1807

2207

### PACKAGE INCLUDES

PT 1000 sensors  
Labelled according to Danfoss standard Included

Pressure tested evaporator (60 bar).  
Documentation supplied Included

### PROVIDED BY COOLING CONTRACTOR

Controller Not factory fitted –  
Installer's choice

Super heat controller Not factory fitted –  
Installer's choice

Expansion valve Not factory fitted –  
Installer's choice

Pressure transmitter Not factory fitted –  
Installer's choice

Electrical box Not factory fitted –  
Installer's choice

## KNOCK-DOWN COUNTERS

*The Knock-Down range has the lowest degree of completion compared to the IC, VC and PIC ranges.*

## SERIES LINE-UP



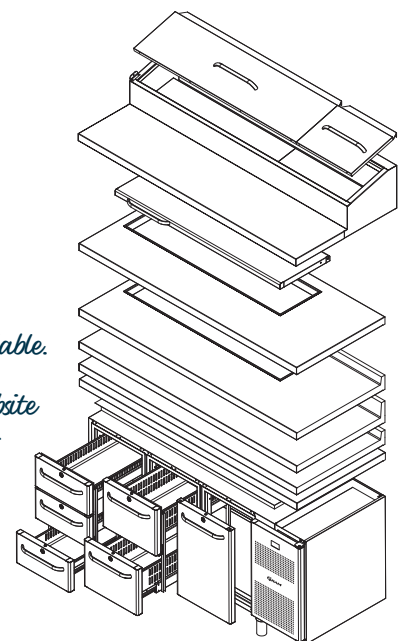
GASTRO 07 - 1407



GASTRO 07 - 1807



GASTRO 07 - 2207



*A wide variety of configurations available.*

*See more on our website or contact your sales support at Hoshizaki.*





## IC - INTEGRATED CONTROLLER SOLUTIONS

*IC solutions include our KPS 60 blast chiller.*

*IC solutions have the highest degree of completion and are as close to plug and play as it gets.*

### GRAM Roll-in Blast Chiller - Ready-to-install

Degree of completion



Blast Chiller model

**KPS 60**

Controller

Gram blast chiller/freezer controller.

#### PACKAGE INCLUDES

Superheat controller (slave)

**Yes**

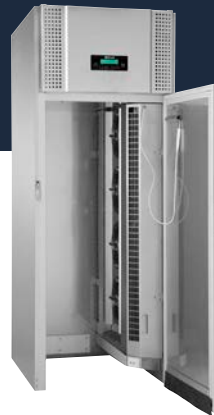
Expansion valve

**Yes**

Pressure transmitter

**Yes**

#### SERIES LINE-UP



**KPS 60**



# PIC - PARTLY INTEGRATED CONTROLLER



## BLAST CHILLERS/FREEZERS

| Degree of completion                       |  |                |
|--|--|----------------|
| <b>Models</b>                              | <b>KPS 120</b>   | <b>KPS 180</b> |
| Chilling capacities (CF Models)            | 120Kg  | 180Kg          |
| Freezing capacities (SF Models)            | 120Kg  | 180Kg          |
| PACKAGE INCLUDES                           |  |                |
| Master Controller                          | Gram blast chiller/freezer controller  |                |
| Module 1: No Room                          | Gram controller and evaporator unit  |                |
| Module 2: Extended package incl. room      | Includes a Gram room which ensures full compatibility with the evaporator unit |                |
| Module 3: Full package                     | This option also includes the refrigeration unit and assembly*                 |                |
| PROVIDED BY COOLING CONTRACTOR *           |  |                |
| Super heat controller (slave)              | Not factory fitted – Installer's choice  |                |
| Expansion valve and coil                   | Not factory fitted – Installer's choice  |                |
| Pressure transmitter and super heat sensor | Not factory fitted – Installer's choice  |                |

\* These options can be considered at the site of installation. Installation by cooling contractor.

## SERIES LINE-UP



**KPS 120** White or stainless exterior

**KPS 180** White or stainless exterior





## PIC - PARTLY INTEGRATED CONTROLLER

### Configuration possibilities KPS 120/180 'With Room' solutions'

| Code | Description                                    | CF                               | SF                               |
|------|--|----------------------------------|----------------------------------|
| LS   | White, outside                                 | <input type="radio"/>            | <input type="radio"/>            |
| CS   | Stainless, outside                             | <input type="radio"/>            | <input type="radio"/>            |
| D    | Pass-through                                   | <input type="radio"/>            | <input type="radio"/>            |
| U    | No floor                                       | <input checked="" type="radio"/> | <input type="radio"/>            |
| B    | With heated floor (different models available) | <input type="radio"/>            | <input checked="" type="radio"/> |
| MI   | Mirrored (complete unit mirrored)              | <input type="radio"/>            | <input type="radio"/>            |
| DL   | Door left                                      | <input type="radio"/>            | <input type="radio"/>            |

### Configuration possibilities KPS 120/180 'No Room' solutions'

| Code | Description                                | CF                    | SF                    |
|------|--|-----------------------|-----------------------|
| LS   | White controller box                       | <input type="radio"/> | <input type="radio"/> |
| CS   | Stainless controller box                   | <input type="radio"/> | <input type="radio"/> |
| D    | Pass-through (with additional door switch) | <input type="radio"/> | <input type="radio"/> |

standard equipment  optional

### GRAM Reach-in Blast Chiller/Freezer

| Degree of completion                       |   |
|--|---|
| Blast Chiller/Freezer model                | KPS 42                                  |
| Chilling capacities (CF Models)            | 45Kg                                    |
| Freezing capacities (SF Models)            | 27Kg                                    |
| PACKAGE INCLUDES                           |   |
| Master Controller                          | Gram blast chiller/freezer controller   |
| PROVIDED BY COOLING CONTRACTOR *           |   |
| Super heat controller (slave)              | Not factory fitted – Installer's choice |
| Expansion valve and coil                   | Not factory fitted – Installer's choice |
| Pressure transmitter and super heat sensor | Not factory fitted – Installer's choice |

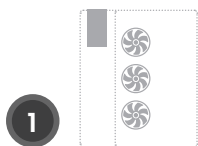
\* These options can be considered at the site of installation. Installation by cooling contractor.

### SERIES LINE-UP



### MODULARITY FOR INDIVIDUAL NEEDS

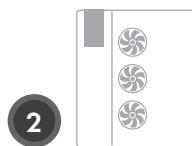
The largest blast chillers/freezers KPS 120 and 180 are available as modules to suit individual needs:



1

#### MODULE 1: NO ROOM

Includes electronic controller and the evaporator unit.



2

#### MODULE 2: EXTENDED PACKAGE INCL. ROOM

This option includes a Gram room which ensures full compatibility with the evaporator unit.



3

#### MODULE 3: FULL PACKAGE

This option also includes the refrigeration unit and assembly.

\* Module 3 is not available for all markets. Please contact our customer service.

Every effort has been made to ensure that the information contained in this publication is accurate at the time of publishing. Hoshizaki UK assumes no responsibility or liability for typographical errors or omissions or for any misinterpretation of the information within the publication and reserves the right to change without notice.



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