



# Future-proof CO<sub>2</sub> solutions



# EXPERIENCE DEVELOPMENT

## Close to the customer

Our first subcritical CO<sub>2</sub> systems in the food retail sector were installed in 2004. This was followed in 2006 by transcritical systems. Today several thousand TEKO CO<sub>2</sub> systems are successfully in operation.

## Standardised CO<sub>2</sub> series

All components of our ROXSTA series are subjected to thorough long-time tests. Like this, you can be sure that all components and controls of your system are tested, functional and safe to use.

- Long-standing experience with transcritical CO<sub>2</sub> systems
- System solutions for every application, including matching controls technology
- High degree of hermetic sealing
- Short delivery times
- TÜV-compliant technology

## Safety and quality

- Reduced soldering joints due to bent K65 pipes via fully automated bending machines and extruded piping
- Leak and pressure testing of every system before delivery (up to 180 bar)
- Fine leak tests with a helium/nitrogen mixture can detect a leakage rate as small as 1 g/year.

## Training options for you

In our in-house training centre in Altenstadt we train over 300 experts every year, including installers, planners and operators. With this, we are actively driving innovation in the HVAC&R sector.



## TEKO-Patent EVALIFT

EVALIFT is our efficient, simple and safe solution to raise the efficiency of the system significantly.

This innovative technology allows evaporation free of superheat directly at the refrigeration points, taking advantage of the full evaporator surface for evaporation.

This is possible via a specially designed heat exchanger in combination with a smart control system.

Also higher system stability leads to a better operational safety and a longer lifetime of your refrigeration system.

### Advantages at a glance

- An alternative to an ejector, with technology that users understand more easily
- Available for MT and LT application
- Improved operational safety, system oil budget and system stability.

## TEKOJET

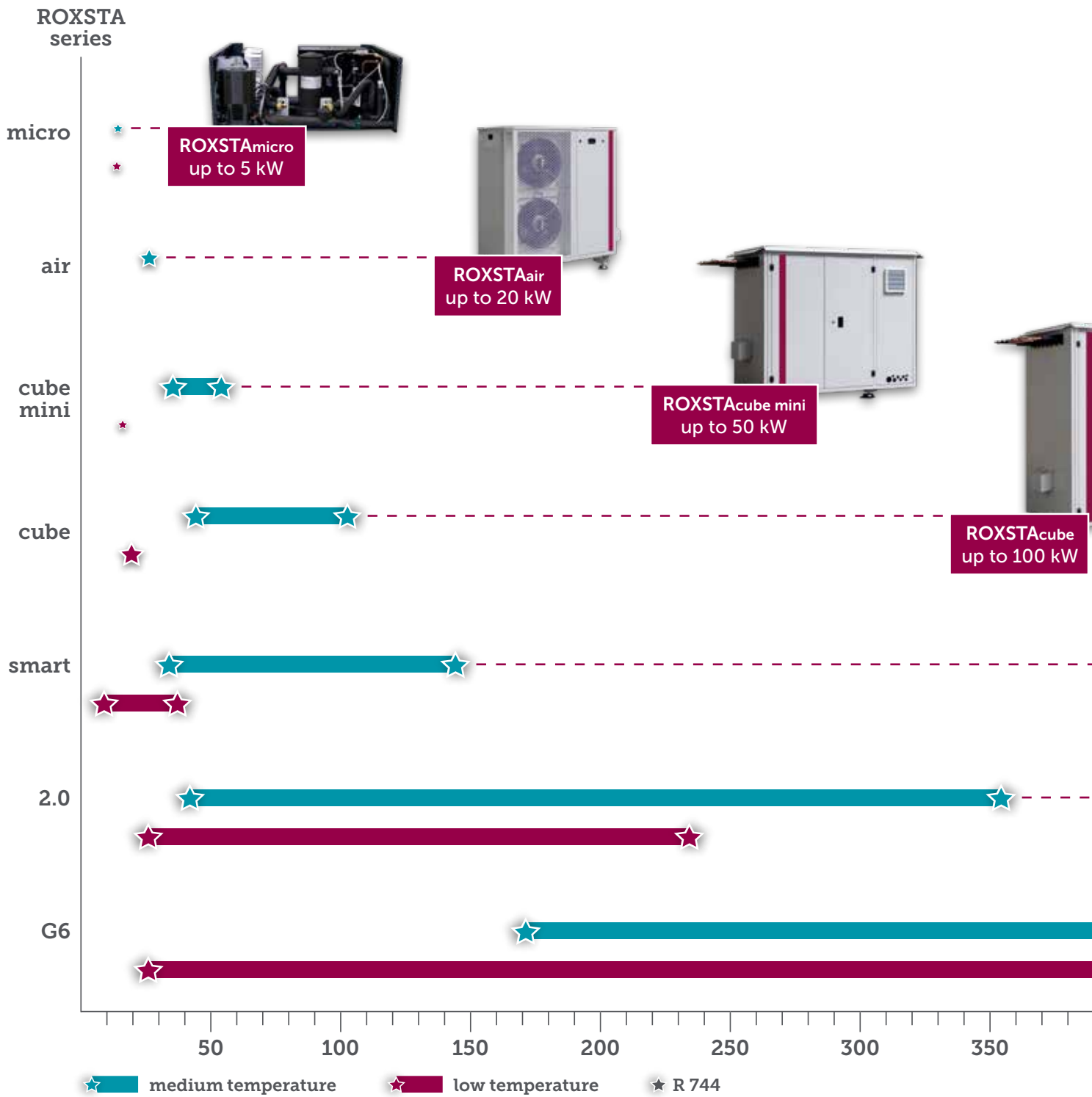
TEKOJET technology combines the EVALIFT patent with a continuous ejector. This results in a further increase in efficiency (approx. +5%), especially in systems with 150 kW cooling capacity or more.



The power of  
EVALIFT

More operational safety  
Less energy costs

# ROXSTA RANGE AT A GLANCE





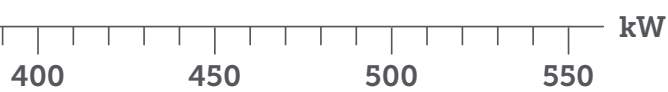
**ROXSTAsmart**  
up to 150 kW



**ROXSTA2.0**  
up to 360 kW



**ROXSTA66**  
up to 550 kW



Capacities up to 5,4 kW

# NEW ROXSTA MICRO

## ROXSTAmicro

ROXSTAmicro is the small and compact CO<sub>2</sub> box for direct connection with MT and LT plug & play units.

### Air or water-cooled condensing unit

- Air-cooled version for food retail, commercial kitchens, cold rooms, ice making
- Water-cooled version for combination with water chillers, dry coolers

### Compressor

The speed-controlled, two-stage rotary compressor offers optimal adaptation to the cooling needs with the lowest possible energy consumption.

### Capacities

(to MT -7 °C / to LT -30 °C / t<sub>GC</sub> 30 °C)

- MT 0.8...5.4 kW. 1 two-stage CO<sub>2</sub> rotary compressor
- LT 0.3...2.5 kW. 1 two-stage CO<sub>2</sub> rotary compressor

### Design pressure

- 45 bar suction line (MT / LT)
- 80 bar medium pressure
- 120 bar high pressure side



### Scope of delivery

- Two-stage speed controlled BLDC Panasonic rotary compressor
- Medium pressure vessel
- High pressure valve
- Filter dryer incl. sight glass
- 2 lockable service valves
- Isolated from the middle pressure points
- Air-cooled for gas cooler / desuperheater combination
- Water-cooled with plate heat exchanger
- Including controls technology
- Powder-coated frame
- Pre-installed M8 mounts to apply feet
- Speed-controlled gas cooler ventilation (optional)

### Dimensions & weight

Model	Type	Weight (kg)	Dimensions (mm)		
			Length	Depth	Height
air-cooled	ROXSTAmicro 63	30	790	495	310
	ROXSTAmicro 163	30			365
	ROXSTAmicro 303	35			
water-cooled	ROXSTAmicro 63	30	620	356	310
	ROXSTAmicro 163	30			365
	ROXSTAmicro 303	35			

## ROXSTAair

ROXSTAair combines machine technology with condenser technology in a space-saving weather proof housing. The unit is suitable for installation with smaller MT systems.

### Installation options

Save yourself a separate machine room.

- Indoor installation with 2 EC radial fans
- Outdoor installation with 2 EC axial fans

### Plug & Play – little assembly effort

The piping including HP and LP safety valves is located inside the housing. Only the liquid and suction lines need to be piped, which simplifies installation and saves time.

### Capacities

(to MT -5 °C / t<sub>GC</sub> 38 °C)

- MT 11...20 kW. 1 transcritical CO<sub>2</sub> compressor

### Design pressure

- 45 / 80 bar suction line
- 45 / 80 bar medium pressure
- 120 bar high pressure side

### Dimensions & weight

Weight (approx. kg)	Dimensions (mm)		
	Length	Depth	Height
420	1,575	965	1,630

### Sound data

54 dB(A) in 10 m

Sound measurements under laboratory conditions (airborne sound at 50 Hz). Despite careful control of the content, we do not assume any liability for the correctness and completeness of the data.



Capacities up to 20 kW

### Scope of delivery

- Transcritical compressor (Bitzer or Frascold)
- Frequency converter included
- Safety features comply with DIN EN 378
- Switch panel with electronic control
- Muffler in discharge side
- Flash gas heat exchanger
- Medium pressure tank (20 L)
- Shut-off measuring connections
- Suction side insulation
- Machine tray with integrated safety valves
- Condenser housing (corrosion category C<sub>3</sub>) with 2 EC radial/axial fans
- Emergency off switch
- Generously dimensioned machine room ventilation
- Antivibration pads for optimal low-vibration positioning

### Heat exchanger

- CO<sub>2</sub> evaporators

Capacities up to 100 kW

# ROXSTA CUBE MINI & CUBE



## Series solution with CO<sub>2</sub>

The system solutions **ROXSTAcube mini** and **ROXSTAcube** are ideal for the demands of discount supermarkets, organic shops or smaller supermarkets.

### Flexible installation

The Series are available for indoor or outdoor installation.

- Without sound insulation for indoor installation
- With basic sound insulation for indoor and outdoor installation (10 dB(A) sound reduction\*)
- With advanced sound insulation for indoor and outdoor installation (15 dB(A) sound reduction\*)

\* max. values according to the installation situation

### Capacities

(to MT -5 °C / to LT -30 °C /  $t_{GC}$  38 °C)

#### ROXSTAcube mini

- MT 19...50 kW. 2 transcritical CO<sub>2</sub> compressors
- LT 0...7 kW. 0...1 subcritical CO<sub>2</sub> compressors

#### ROXSTAcube

- MT 28...100 kW. 3 transcritical CO<sub>2</sub> compressors
- LT 0...14 kW. 0...2 subcritical CO<sub>2</sub> compressors

### Design pressure

- 30 bar suction line (LT)
- 45 bar suction line (MT)
- 45 / 60 bar medium pressure
- 120 bar high pressure side



Model	Installation options			Weight (approx. kg)	Dimensions (mm)		
					Length*	Depth	Height
ROXSTAcube mini	mounted switch cabinet	indoor	without sound insulation	800	1,710	900	1,584
		indoor & outdoor	sound insulation 40 mm	1,100	1,785	1,020**	1,624
		outdoor	advanced sound insulation 100 mm	1,700	2,200	1,200**	1,830
ROXSTAcube	separately arranged switch cabinet	indoor	without sound insulation	1,150	1,230	900	2,164
			sound insulation 50 mm	1,300	1,350	920	2,214
	mounted switch cabinet	indoor	without sound insulation	1,500	1,775	920	2,214
			sound insulation 40 mm	1,800	1,785	1,020**	2,204
		outdoor	advanced sound insulation 100 mm	2,100	2,200	1,200**	2,410

\* plus 200 mm pipe connections

\*\* plus 200 mm ventilation cover

## Scope of delivery

- Transcritical and subcritical compressors (Bitzer / Frascold)
- Frequency converter included (per lead compressor)
- Oil regulation system
- Safety devices conform to DIN EN 378
- Switch cabinet with electronic control
- Medium pressure collector (ROXSTAcube mini 60 / 80 L) (ROXSTAcube 80 / 100 L)
- Ball stop valve before and after high and medium pressure valve (before HP valve loosely enclosed)
- Flash gas heat exchanger
- Ball stop valve for the common discharge line of the medium temperature cooling (loosely enclosed)
- Suction filter in combination with ball stop valve (loosely enclosed) on suction line (MT)
- Liquid set consisting of two ball stop valves, liquid filter and sight glass
- Insulation on suction side
- Antivibration pads for optimal positioning with low vibration
- Safety valve station

## Optional

- Weather proof and sound insulation housing for indoor or outdoor installation
- Basic sound insulation (40 mm insulation)
- Advanced sound insulation (100 mm insulation)
- HR incl. 3-way ball motor valve and temperature sensor

## Heat exchanger

- CO<sub>2</sub> evaporators
- Gas cooler



## ROXSTAsmart

The sustainable **ROXSTAsmart** concept fits perfectly to the requirements of small to medium-sized supermarkets, commercial kitchens or smaller warehouses.

### Capacities

(to MT -5 °C / to LT -30 °C /  $t_{GC}$  38 °C)

- MT 28...150 kW. 3...4 transcritical CO<sub>2</sub> compressors
- LT 0...43 kW. 0...3 subcritical CO<sub>2</sub> compressors

### Integral system

**ROXSTAsmart** is used in our integral concept. Commercial refrigeration, air conditioning and building heating are completely realised in just one system.

### Space-saving and easy to install

- Compact construction
- Easy to install
- Easy to maintain
- Pre-piped and pre-wired
- Tested completely and in full compliance with CE-standards
- Minimal installation effort

### Design pressure

- 30 bar suction line (low temperature)
- 45 bar suction line (medium temperature)
- 60 bar medium pressure
- 120 bar high pressure side

Model ROXSTAsmart	Receiver  (litres)	Weight  (kg)	Dimensions (mm)		
			Length*	Depth	Height
3/0-2	165	1,710	2,430	800	1,950
	2 x 165	1,840	3,110		
4/0-3	165	1,870	2,860		
	2 x 165	2,000	3,540		

\* with heat recovery pump: plus 250 mm in length

## Scope of delivery

- Trans- and subcritical compressors (Bitzer / Frascold)
- Frequency converter included (per lead compressor)
- Oil regulation system
- Safety devices conform to DIN EN 378
- Switch cabinet with electronic control
- Regulated post-injection
- Ball stop valve before and after the high and medium pressure valves
- Ball stop valve for the common discharge line of the medium temperature cooling
- Suction filter in combination with ball stop valve in the suction line – both for MT and LT
- Liquid set consisting of two ball stop valves, liquid filter and sight glass
- Heat exchanger for suction gas superheat in low temperature cooling
- Insulation on suction side
- Antivibration pads for optimal positioning with low vibration
- Safety valve station

## Optional

- **COOL<sub>2</sub>HEAT<sub>basic</sub>** incl. 3-way valve and insulation of the discharge line, oil separator and plate heat exchanger (service or hot water)
- **COOL<sub>2</sub>HEAT<sub>basic</sub>** as stand-alone circuit (service or hot water)
- Second control valve for high and medium pressure
- Minimum level control
- Standstill cooling unit (loose at delivery; connections to receiver provided)
- Tandem receiver (2x 165 L)
- Gas cooler bypass
- Pump for heat recovery
- Connections for external desuperheater
- Intermediate pressure 80 bar
- Regulated post-injection
- Controlled MT suction gas heat exchanger
- LT suction gas heat exchanger
- Weather proof and sound insulation housing for outdoor installation with heating for oil receiver

## Heat exchanger

- CO<sub>2</sub> evaporators
- Gas cooler



## ROXSTA2.0

ROXSTA2.0 is suitable for larger supermarkets, food production and logistics or warehouses. For difficult placement situations or narrow machine rooms, the machine and medium pressure station can be separated on site.

### Capacities

(to MT -5 °C / to LT -30 °C /  $t_{cc}$  38 °C)

- MT 36...360 kW. 3...6 transcritical CO<sub>2</sub> compressors
- LT 0...240 kW. 0...5 subcritical CO<sub>2</sub> compressors

### Freshness first

The quality of chilled goods always is the highest priority. When using heat recovery / heat pump or climate function the first step is to check whether the goods temperature is safe.

### Detachable heat pump compressor

During the heating period, the heat pump compressor can be detached from the cooling mode (separate temperature level). The compressors of the medium temperature cooling remain on a constant level of evaporating temperature, the efficiency of the unit remains preserved.

### EVALIFT / TEKOJET / Ejektors

We are happy to advise you which efficiency-enhancing technologies are right for your project.

### Design pressure

- 30 / 60 bar suction line (low temperature)
- 45 / 60 bar suction line (medium temperature)
- 45 / 60 bar medium pressure
- 120 bar high pressure side

Model ROXSTA2.0	Receiver content (litres)	Weight (kg)	Dimensions (mm)				
			Length* unit	Length MP station	Length total	Depth	Height
3/0-2	165 250 420 2 x 165 2 x 250	on request	3,750	1,100 (165 L / 250 L)	dependent on MP station	976	2,030
4/0-3			4,200				
5/0-4			4,900	1,233 (420 L)			
6/0-5			5,400	2,000 (2 x 165 L / 2 x 250 L)			

\* Incl. switch cabinet

## Scope of delivery

- Trans- and subcritical compressors (Bitzer / Frascold)
- Frequency converter included (per lead compressor)
- High and low pressure packages (gauge, LP cut-out, pressure transducer)
- Pressure cut-out for high and safety pressure, non-adjustable, type tested per compressor
- Safety valves for high/medium pressure and suction side (optional redundant)
- Insulation on suction side
- Medium pressure receiver (165 L / 250 L / 420 L / 2 x 165 L / 2 x 250 L)
- Sensor at the outlet of the gas cooler
- Minimum (and maximum – optional) level control
- Insulation of the medium pressure vessel
- Regulated post-injection
- Stop valve after filter-drier and sight glass
- Antivibration pads
- Suction filter (MT/LT)
- Oil sump heater each compressor

### Switch cabinet and control

- Switch cabinet with electronic control
- All switching devices which are necessary for fully automatic operation
- Electric components are labelled according to German standards
- Ventilation of the switch cabinet

- Main switch
- Control transformers
- Independent power supply closes the high and medium pressure valves in case of power failure
- Energy metering MT/LT (optional)

### Optional

- Flash gas and suction gas heat exchanger MT/LT
- Sound insulation / weather protection 40 mm incl. heater band on oil receiver

### Heating and air conditioning

- Heat exchanger for heating and service water incl. manual bypass & 3-way ball motor valve
- Charge pumps for heating and service water
- Heat pump compressor
- Air conditioning function
- Insulation on pressure side (13 mm)

### Improvement in efficiency

- Parallel compression
- Ejectors
- TEKO development EVALIFT & TEKOJET

### Heat exchanger

- CO<sub>2</sub> evaporators
- Gas coolers



## ROXSTAG6

TEKO's new series solution is tailored for large supermarkets and hypermarkets. The **ROXSTAG6** covers also many requirements in the field of food production and logistics.

### Compact design

The combination of powerful 6-cylinder compressors with frequency controlled 4- or 6-cylinder guide compressors enables an extremely compact design for this size of unit. It does not leave out the optimally matched partial load requirements.

### Capacities

(to MT -5 °C / to LT -30 °C /  $t_{cc}$  38 °C)

- MT 207...550 kW. 3...6 transcritical CO<sub>2</sub> compressors
- LT 0...490 kW. 0...5 subcritical CO<sub>2</sub> compressors

### Eco-parallel compression

In larger power ranges (> 80 kW), eco-parallel compression can deliver significant efficiency advantages. In combination with our control concept, it is checked during the operation of the unit whether the ECO-compression is an advantage. Depending on this, the feature is activated or not.

### EVALIFT / TEKOJET / Ejectors

We are happy to advise you which efficiency-enhancing technologies are right for your project.

### Design pressure

- 30 / 60 bar suction line (low temperature)
- 45 / 60 bar suction line (medium temperature)
- 45 / 60 bar medium pressure
- 130 bar high pressure side

Model ROXSTA G6	Receiver (litres)	Weight (kg)	Dimensions (mm)				
			Length Unit	Length MP station	Length Total	Depth	Height
3/0-2	250 / 2 x 250 420 / 2 x 420	on request	3,400	inside unit (250 / 420 L)  1,300 (2 x 250 / 2 x 420 L)	dependent on unit & MP station & switch cabinet	unit 1,150  switch cabinet 1,200 (up to 400 A) 1,600 (up to 630 A)	unit 2,030  switch cabinet 2,400
4/0-3			3,950				
5/0-4			4,500				
6/0-5			5,050				

## Scope of delivery

- Trans- and subcritical compressors (Bitzer / Frascold)
- Frequency converter included (per lead compressor)
- High and low pressure packages (gauge, LP cut-out, pressure transducer)
- Pressure cut-out for high and safety pressure, non-adjustable, type tested per compressor
- Safety valves for high/medium pressure and suction side (optional redundant)
- Insulation on suction side
- Medium pressure receiver (165 L / 250 L / 420 L / 2 x 165 L / 2 x 250 L)
- Sensor at the outlet of the gas cooler
- Minimum (and maximum – optional) level control
- Insulation of the medium pressure vessel
- Regulated post-injection
- Stop valve after filter-drier and sight glass
- Antivibration pads
- Suction filter (MT/LT)
- Oil sump heater each compressor

### Switch cabinet and control

- All switching devices which are necessary for fully automatic operation
- Electric components are labelled according to German standards
- Ventilation of the switch cabinet
- Main switch

- Control transformers
- Independent power supply closes the high and medium pressure valves in case of power failure
- Energy metering MT/LT (optional)

### Optional

- Flash gas and suction gas heat exchanger MT/LT
- Outdoor installation as container solution

### Heating and air conditioning

- Heat exchanger for heating and service water incl. manual bypass & 3-way ball motor valve
- Insulation on pressure side (13 mm)

### Efficiency enhancement

- Parallel compression
- Ejectors
- TEK development EVALIFT & TEKOJET

### Heat exchanger

- CO<sub>2</sub> evaporators
- Gas coolers



## ROXSTAindustrial

### CO<sub>2</sub>-technology for industrial needs

ROXSTAindustrial meets the demands of the industry, food production and logistics perfectly. The transcritical CO<sub>2</sub>-series provides a high level of flexibility in order to satisfy customer needs and completely meet the demands within the kinds of use

### Capacities

(to MT -5 °C / to LT -30 °C / t<sub>cc</sub> 38 °C)

- MT 390...570 kW. 4...6 transcritical CO<sub>2</sub> compressors
- LT 0...490 kW. 0...5 subcritical CO<sub>2</sub> compressors

### Superheat plates heat exchangers for flash and suction gas

Increase in the flash and suction gas temperatures for a safe and stable unit operation.

### Active liquid subcooling

For longer piping paths or bigger height differences within the piping network, the ROXSTA-series contains active subcooling of the refrigerant. The differences in temperature within a unit are reduced, the behaviour of the unit also remains stable when distances are longer.

### Subcooling plate heat exchanger for gas cooler.

For attachment of an exterior chiller. Especially in southern countries, the additional cooling of the refrigeration circuit can keep a transcritical unit energetically stable. In doing so, sensitive products are protected.

### Design pressure

- 30 / 60 bar suction line (low temperature)
- 45 / 60 bar suction line (medium temperature)
- 45 / 60 bar medium pressure
- 120 bar high pressure side



Modell ROXSTA industrial	Receiver (litres)	Weight (kg)	Dimensions (mm)*					
			Length unit	Length MP station	Length** switch cabinet	Length total	Depth	Height
4/0-3	165 / 2 x 165	on request	3,100	1,500 (165 / 250 / 420 L)	1,400 (up to 630 A)	dependent on MP station & switch cabinet	1,300	2,300
5/0-4	250 / 2 x 250		3,700	2,200	1,800 (up to 800 A)			
6/0-5	420 / 2 x 420		4,300	2,600 (2 x 165 / 2 x 250 / 2 x 420 L)	2,600 (up to 1,000 A)			

\* The dimensions may vary depending on the project

\*\* Incl. frame part

## Scope of delivery

- Transcritical and subcritical CO<sub>2</sub> piston compressors by Bitzer or Frascold connected as a booster
- Guide compressor with frequency converter
- Ball stop valves
- High and low pressure packages (gauge, LP cut-out, pressure transducer)
- Pressure cut-out for high and safety pressure, non-adjustable, type tested per compressor
- Safety valves for high/medium pressure and suction side (optional redundant)
- Muffler for pulsation damping in the common discharge line (LT)
- Insulation on suction side
- Medium pressure receiver (165 / 250 / 2 x 165 / 2 x 250 L) & (420 / 2 x 420 L)
- Sensor at the outlet of the gas cooler
- Minimum level display
- Insulation of the medium pressure vessel
- Valve for post-injection
- Stop valve after filter-drier and sight glass
- Antivibration pads
- Suction filter (MT/LT)
- Oil sump heater each compressor

### Switch cabinet and control

- Switch cabinet with electronic control
- All switching devices which are necessary for fully automatic operation
- Electric components are labelled according to German standards
- Ventilation of the switch cabinet
- Main switch
- Control transformers
- Independent power supply closes the high and medium pressure valves in case of power failure
- Energy metering MT/LT (optional)

### Optional

- Maximum level display
- Flash gas and suction line heat exchanger MT/LT
- Active liquid subcooling
- Subcooling plate for gas cooler
- Sound insulation / weather protection 40 mm incl. heater band on oil receiver

### Heating and air conditioning

- Heat exchanger for heating and service water incl. manual bypass & 3-way ball motor valve
- Charge pumps for heating and service water
- Heat pump compressor
- Air conditioning function
- Insulation on pressure side (13 mm)

### Efficiency enhancement

- Parallel compression
- Ejectors

### Heat exchanger

- CO<sub>2</sub> evaporators
- Gas coolers



## What does „integral“ mean?

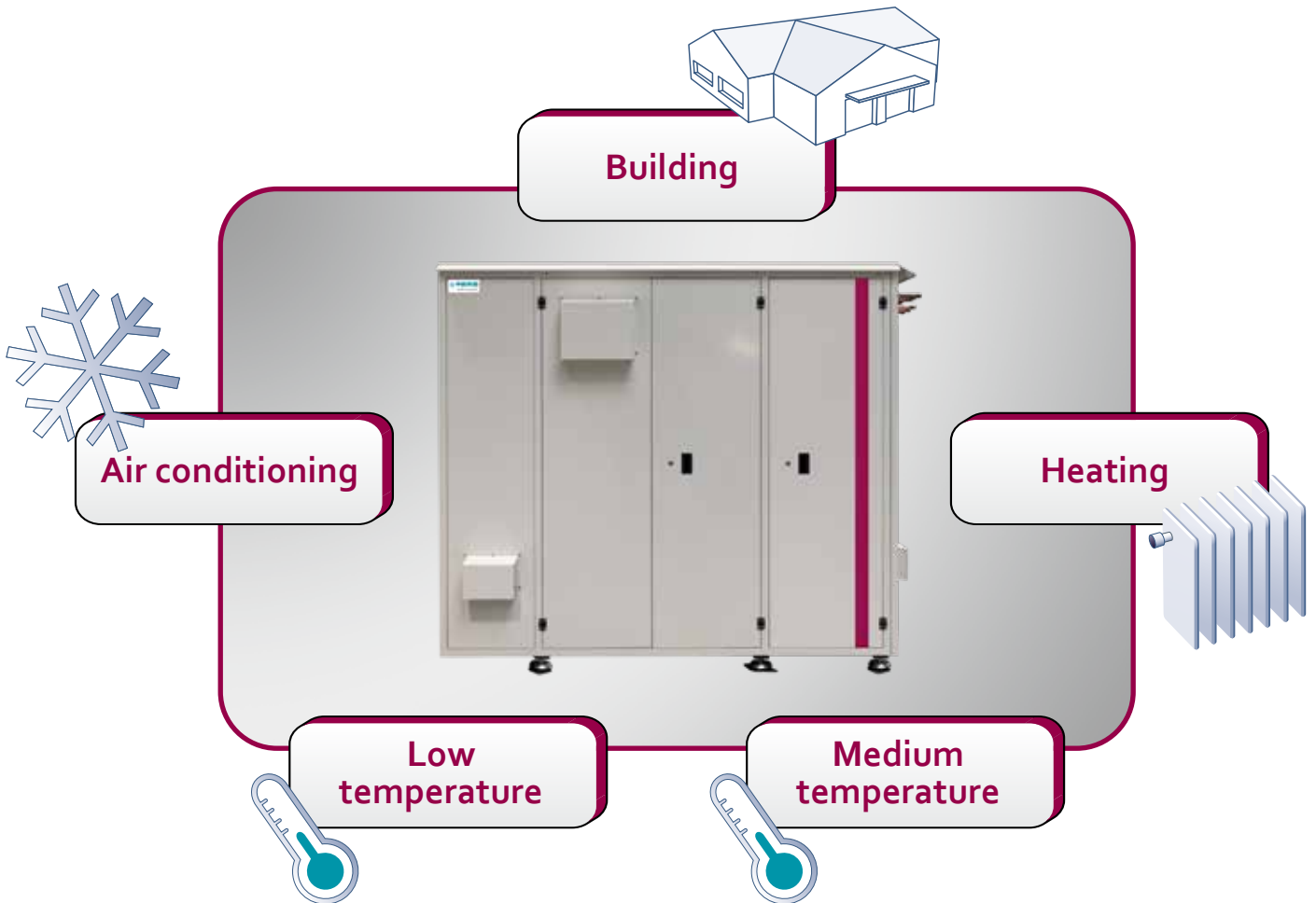
- Building management, refrigeration and heating technology, air conditioning and ventilation systems optimally coordinated
- Perfect temperatures in any application
- System components fit seamlessly into the overall refrigeration concept of the market

## All-in-one solution for food retailers

- Adequate provision of refrigeration, heating and air-conditioning according to customer-specific requirements
- „Freshness First“– in an integral concept, the refrigerated goods are the first priority
- Consistent and complete linking of the building and cooling technology
- CO<sub>2</sub>-controlled ventilation technology for a good indoor climate
- All components are precisely matched to one another
- Clean system interfaces
- Energy saving & environmentally friendly

## KEEP IT SIMPLE!

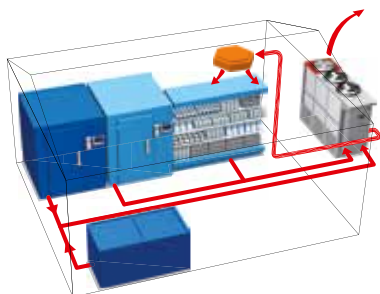
Commercial refrigeration, air conditioning and heating in one system



### Spring / Autumn

The recovered waste heat from the refrigeration process is used for the comfort heating of the market.

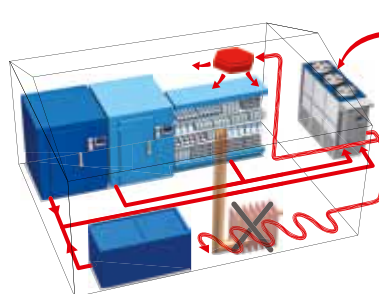
→ Reduction of heating costs



### Winter

Full utilization of waste heat plus heat pump function on particularly cold days.

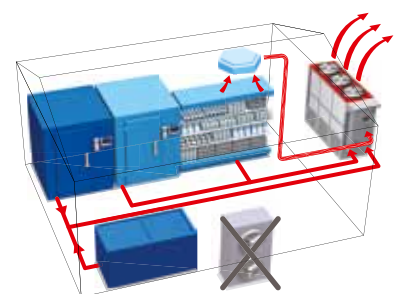
→ Saving the heating system



### Summer

Heat is withdrawn from the sales and social rooms and discharged to the outside.

→ Saving the air conditioning system



**TEKO Refrigeration**  
www.teko-gmbh.com

