

# Water-Cooled Screw Chillers and Water/Water Heat Pumps

## CITY

Model RTSF G (R1234ze)  
180 -385 kW



**IR** Ingersoll Rand®

# Trane City

## Water-Cooled Chillers and Water/Water Heat Pumps

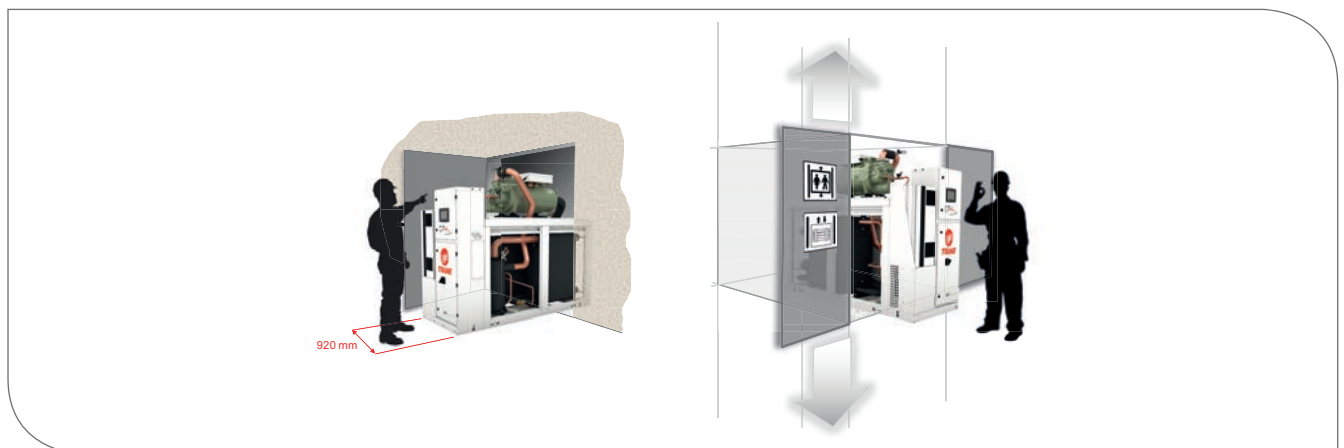
### Sustainable and efficient

We know that what we do makes an impact on our world. This is why we designed City RTSF: The low global warming potential solution with industry leading efficiencies for capacities below 400 kW.

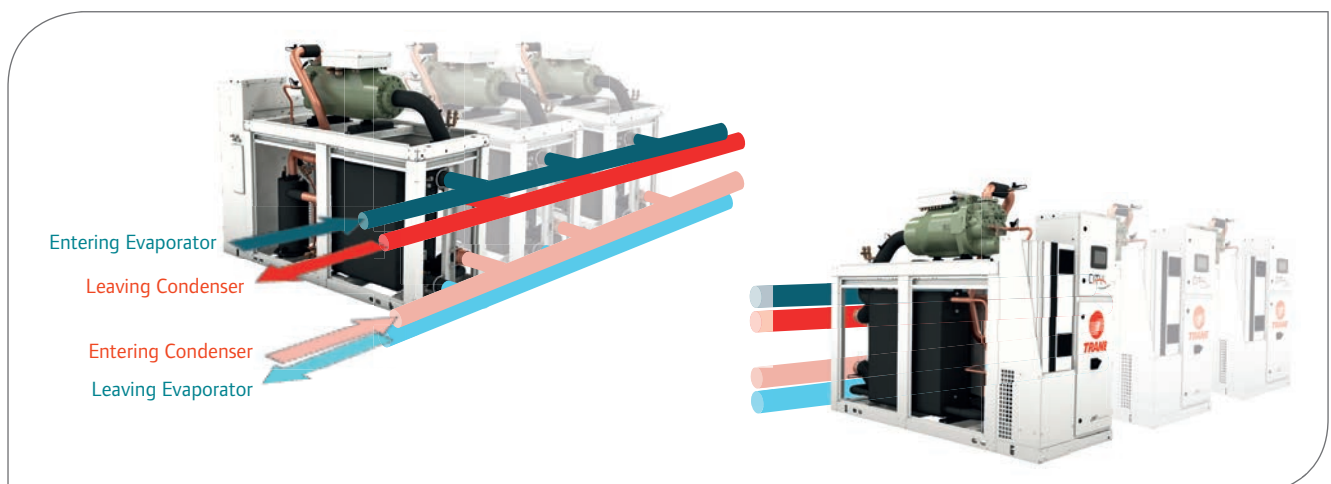
City RTSF features low GWP (<1) R1234ze and carries the Ingersoll Rand EcoWise Endorsement.

### Compact and modular

Modern cities do not always allow for easy transportation of large units into, onto or next to buildings. With this challenge in mind, City has been specially engineered for restricted spaces, facilitated moving and installation.



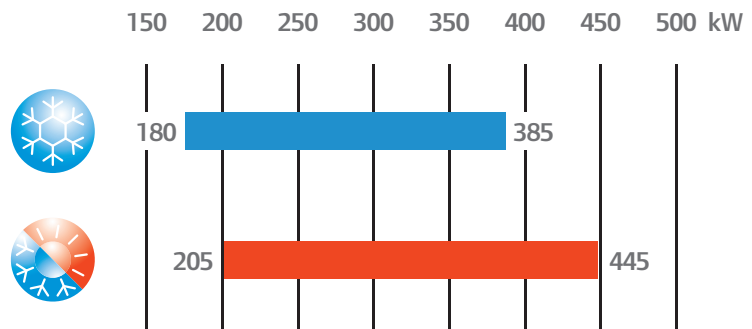
City's modularity makes it suitable when an extension of capacity becomes required as the building evolves or when the chiller plant is designed with multiple staggered chillers to further improve efficiency.



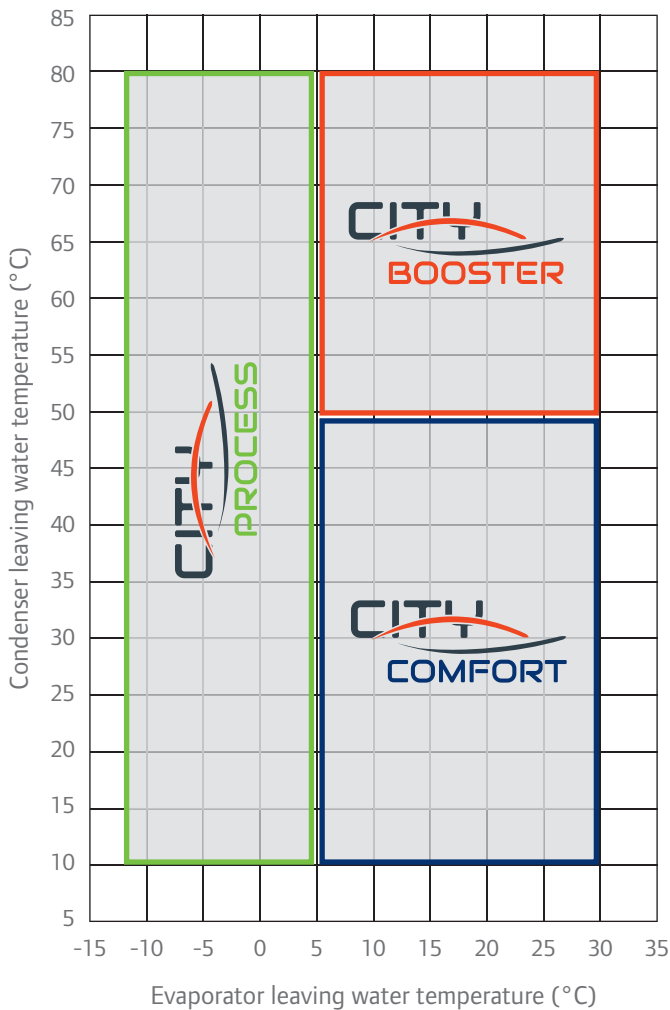
# Range Description



City satisfies any application and covers a wide spectrum of operating conditions in both cooling and heating.



Chillers and Water-to-Water Heat pump  
Application range



## Performance and Sustainability at hand for comfort

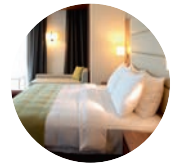
Efficiency optimized for moderate comfort applications in cooling or heating up to 50°C, or industrial process applications at positive temperatures.



District Cooling  
District Heating



Office buildings

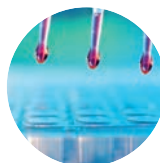


Hospitality  
industry



## Sustainable solution (GWP < 1) with safe operation

Efficiency optimized for freezing industrial brine process applications.



Pharmaceutical  
industry



Food and  
beverage industry



Automotive  
industry



# Range Description

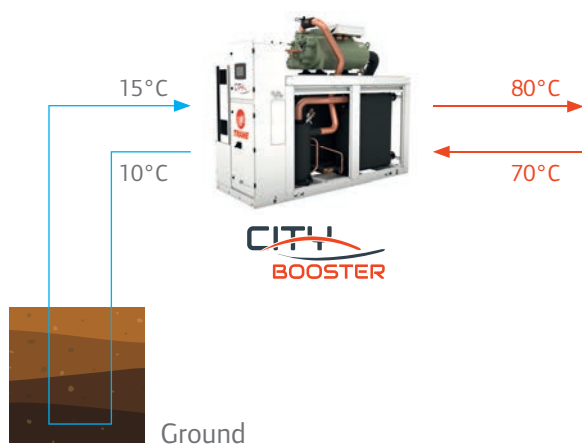
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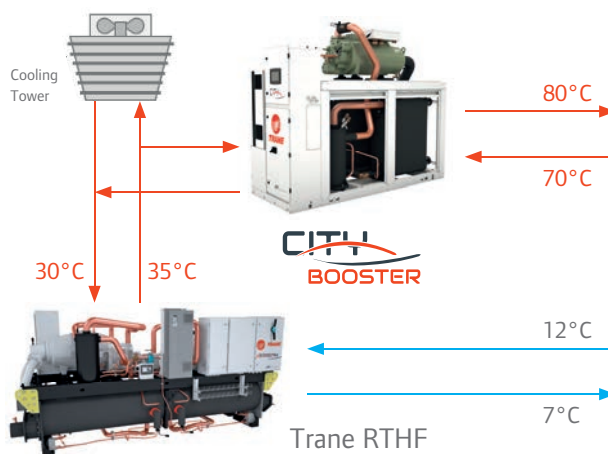
A unique opportunity to move to renewable energy heating

Operation and efficiency have been optimized to deliver high temperature hot water between 50 and 80°C.

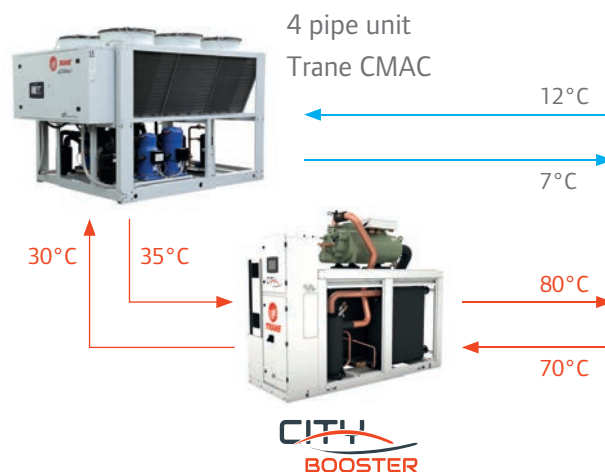
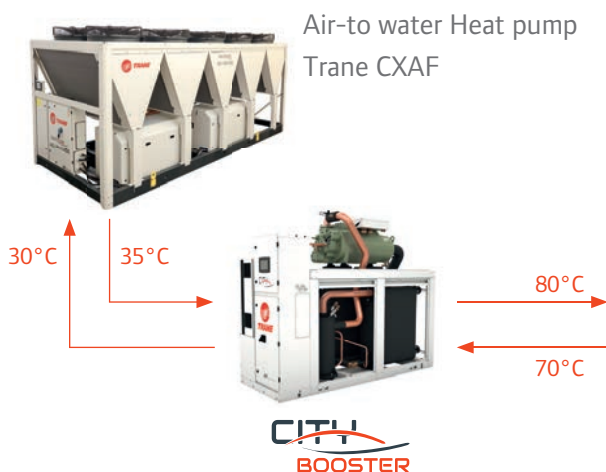
## Geothermal heating



## Heat recovery cascade



## Cascade with Heat pump or 4 Pipe



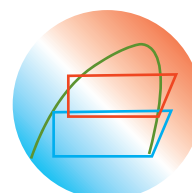
High temperature Heating



Sanitary Hot Water



District Heating



Heat recovery Cascade

# A concentrate of Trane "Expertise"

## 1 Adaptive Frequency™ Drive

- Industry leading Seasonal Efficiency
  - Energy bill reduced
- Eliminates inrush current
  - No oversizing of electrical components
  - Decrease cost of installation

## 2 Trane industry-leading compressor

- Direct drive, low speed screw design
  - Excellent load matching
  - Unequaled long lasting reliability

## 3 Heat exchangers

- Single circuit brazed plates Heat exchangers
  - Maximum efficiency



## 4 Controls

- Fastest controls of the industry
- Safe VPF
- No nuisance trips (Adaptive Control)
- Temperature control within 0.3°C
  - Efficient, reliable and accurate operation

## 5 Compact design

- 920 mm width only
  - Fits standard doors and elevators
  - Can be easily moved

## 6 Acoustically insulated panels (optional)

- Reduce sound emissions by up to 9 dB(A)

# The Future of F-Gases

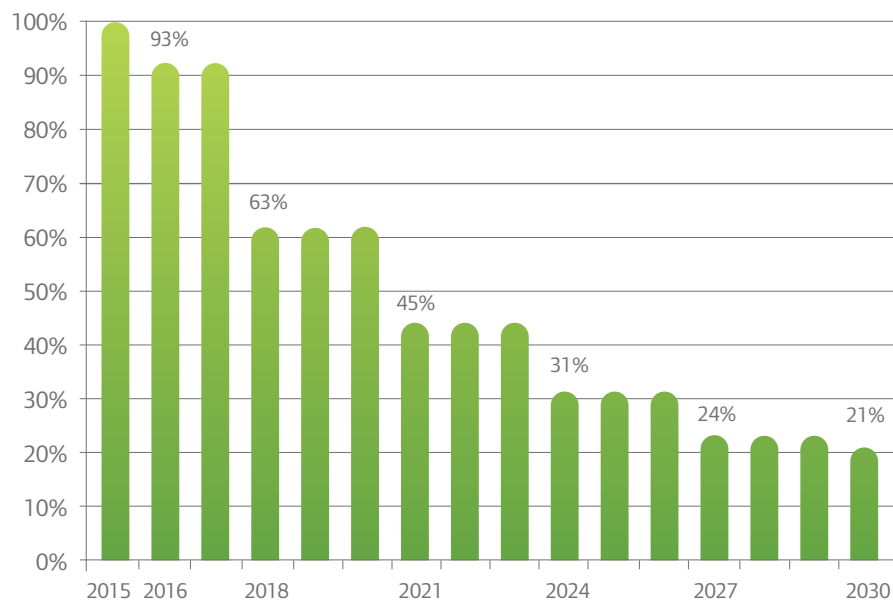
The fluorinated refrigerants phase-down, as defined in the new EU F-Gas Regulation, is a step-by-step approach where the quantities of HFCs expressed in CO<sub>2</sub> equivalent that are placed on the market are gradually reduced. As a result of the phase-down, HFC consumption will be reduced by 79% by 2030.

This is an unprecedented reduction and means that industry and users need to make, over time, the transition to refrigerants with a lower global warming potential.

Trane, recognized as a leading innovator in the HVAC industry, introduces this new, next generation, lower GWP refrigerant in Sintesis and other products to be front running in the marketplace and to support your strong sustainability objectives.

Ingersoll Rand and Trane - providers of sustainable solutions.

## HFC consumption



Baseline value (100%) is the annual average of total quantity of CO<sub>2</sub> equivalents placed on the EU market from 2009 to 2012.

# An environmentally sustainable solution

# EcoWise™

City chillers and heat pumps with low GWP refrigerants are part of the Ingersoll Rand EcoWise™ portfolio of products that are designed to lower their environmental impact with next-generation, low global warming potential (GWP) refrigerants and high-efficiency operation.



## New R1234ze

Ozone depletion potential = 0

Low global warming potential (GWP<1)

| Refrigerant | Global Warming Potential (GWP) |
|-------------|--------------------------------|
| R410A       | 1924                           |
| R407C       | 1774                           |
| R134a       | 1300                           |
| R513A       | 572                            |
| R1233zd     | 1                              |
| R1234ze     | <1                             |

### What is GWP?

GWP is the global warming impact relative to the impact of the same quantity of carbon dioxide over a 100 year period.

### What is ODP?

Ozone depletion potential of a chemical is the amount of degradation to the ozone layer it can cause.

# General specifications



## RTSF G



| CITY COMFORT                              |       | RTSF 050 G | RTSF 060 G | RTSF 070 G | RTSF 090 G | RTSF 100 G | RTSF 110 G |
|-------------------------------------------|-------|------------|------------|------------|------------|------------|------------|
| <b>Cooling Performances</b>               |       |            |            |            |            |            |            |
| Net cooling capacity (1) (2)              | (kW)  | 183        | 220        | 264        | 314        | 361        | 386        |
| Net EER (1) (2)                           |       | 5.02       | 5.10       | 5.01       | 4.93       | 4.54       | 4.33       |
| Net ESEER (2)                             |       | 7.59       | 7.64       | 7.35       | 7.70       | 7.16       | 6.53       |
| SEER (3)                                  |       | 6.16       | 6.40       | 6.62       | 7.10       | 6.89       | 6.13       |
| Space cooling efficiency $\eta_{s,c}$ (3) | (%)   | 239        | 248        | 257        | 276        | 268        | 237        |
| <b>Heating performances</b>               |       |            |            |            |            |            |            |
| <b>Air conditioning heating</b>           |       |            |            |            |            |            |            |
| Net Heating capacity (4)                  | (kW)  | 204        | 243        | 294        | 351        | 410        | 443        |
| Net COP (4)                               |       | 4.50       | 4.59       | 4.57       | 4.55       | 4.34       | 4.33       |
| <b>High temperature heating</b>           |       |            |            |            |            |            |            |
| Net Heating capacity (5)                  | (kW)  | 182        | 221        | 255        | 308        | 308        | 364        |
| Net COP (5)                               |       | 3.74       | 3.78       | 3.92       | 3.90       | 3.85       | 3.79       |
| SCOP (6)                                  |       | 4.78       | 4.87       | 5.03       | 5.07       | 5.12       | 5.19       |
| Space heating efficiency $\eta_{s,h}$ (6) | %     | 183        | 187        | 193        | 195        | 197        | 199        |
| CITY PROCESS                              |       | RTSF 050 G | RTSF 060 G | RTSF 070 G | RTSF 090 G | RTSF 100 G | RTSF 110 G |
| Net Cooling capacity (7)                  | (kW)  | 95         | 115        | 134        | 160        | 187        | 212        |
| SEPR (8)                                  |       | 4.62       | 4.74       | 4.84       | 4.59       | 4.46       | 4.31       |
| CITY BOOSTER                              |       | RTSF 050 G | RTSF 060 G | RTSF 070 G | RTSF 090 G | RTSF 100 G | RTSF 110 G |
| <b>Very High temperature application</b>  |       |            |            |            |            |            |            |
| Net Heating capacity (9)                  | (kW)  | 171        | 207        | 240        | 288        | 289        | 344        |
| Net COP (9)                               |       | 3.02       | 3.05       | 3.16       | 3.14       | 3.10       | 3.09       |
|                                           |       | RTSF 050 G | RTSF 060 G | RTSF 070 G | RTSF 090 G | RTSF 100 G | RTSF 110 G |
| <b>Acoustics</b>                          |       |            |            |            |            |            |            |
| Sound                                     | dB(A) | 93         | 93         | 98         | 98         | 98         | 94         |
| <b>Dimensions &amp; Weights</b>           |       |            |            |            |            |            |            |
| Length (10)                               | (mm)  | 2240       | 2240       | 2240       | 2240       | 2240       | 2240       |
| Width (10)                                | (mm)  | 900        | 900        | 900        | 900        | 900        | 900        |
| Height (10)                               | (mm)  | 1940       | 1940       | 1960       | 1960       | 1960       | 1960       |
| Shipping Weight (10)                      | (kg)  | 1610       | 1675       | 1900       | 1985       | 1985       | 1985       |

(1) Evaporator 12/7°C and 0.0 m²K/kW, and condenser at 30/35°C and 0.0 m²K/kW

(2) Net performances calculated as per EN 14511-2013.

(3)  $\eta_{s,c}$  / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

(4) at 10/7°C Entering/Leaving evaporator and 40/45°C Entering/Leaving condenser

(5) at 10/7°C Entering/Leaving evaporator and 47/55°C Entering/Leaving condenser

(6)  $\eta_{s,h}$  / SCOP as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for space heaters with 400 kW maximum rated capacity - COMMISSION REGULATION (EU) N° 813/2013/EU of 2 August 2013

(7) at -3/-8°C Entering/Leaving evaporator and 30/35°C Entering/Leaving condenser

(8) SEPR as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Industrial Process Chillers - COMMISSION REGULATION (EU) N° 2015/1095/EU of 5 May 2015

(9) at 10/7°C Entering/Leaving evaporator and 55/65°C Entering/Leaving condenser

(10) For Base version without panels



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