

**mitsubishi electric**  
**HYDRONICS & IT COOLING SYSTEMS S.p.A.**

**WATER SOURCE CHILLERS**

# NR<sup>2</sup>-W G06

**WATER SOURCE CHILLERS WITH SCROLL  
COMPRESSORS AND LOW-GWP REFRIGERANT,  
FROM 45 kW TO 242 kW**

**r**  
**R454B**



# NR<sup>2</sup>-W G06

**THE INDOOR WATER COOLED CHILLER PERFECT FOR EVERY APPLICATION WITH GREEN R454B REFRIGERANT**



**Water source chillers with scroll compressor technology. From 45 kW to 242 kW**



NR2-W-G06 is the ultimate chiller solution with scroll compressors, capable of meeting the needs of every application. This new water-cooled range perfectly combines the use of the low GWP refrigerant R454B with the hermetic rotary scroll compressors dedicated to indoor spaces. Designed to meet the latest efficiency targets, also thanks

to the innovative IDV technology, NR2-W-G06 shows very high efficiency levels especially at partial loads and always guarantees a reliable operation in any working conditions.

## THE GREENER CHILLER WITH SUPERIOR EFFICIENCY FOR EVERY SEASON

### EFFICIENCY

UP TO

EER

SEPR HT

NR2-W-G06

5,00

8,68

EER: 12/7 °C, water 30/35°C (EN14511 values)  
SEER: Regulation (EU) N. 2016/2281



**WIDE OPERATING RANGE FOR IT COOLING APPLICATION**



EVAPORATOR (PLANT SIDE)

-10 °C

+25 °C

### ACOUSTIC VERSIONS

#### Standard

Low sound power levels already in the standards version.

Baseline

#### Acoustical Enclosure «Plus»

Unit with sound insulation on the compressors and on the panels.

-4 dB(A)

### POSSIBLE CONFIGURATIONS

#### NR2-W-G06

Cooling only chiller

#### NR2-W-G06-D

Unit with partial heat recovery system

## NEW GENERATION GREEN REFRIGERANT

R454B

Fully committed to supporting the creation of a greener tomorrow, Mitsubishi Electric Hydronics & IT Cooling Systems presents the G06 series, chillers with reduced environmental impact.

Thanks to the new generation refrigerant R454B, the environmental impact of NR2-W-G06 is greatly reduced. Combining reduced refrigerant charge with a low GWP refrigerant, these units boast the lowest amount of CO<sub>2</sub>eq in the scroll unit market, thus resulting as the perfect choice for any new forward looking installation.

### R454B REFRIGERANT

High density, low **GWP refrigerant**. Its physical properties are **similar to R410A**, so the same type of equipment / components can be used.



#### REDUCED ENVIRONMENTAL IMPACT

- ▶ **Low GWP**, only 466
- ▶ **Reduced refrigerant charge** (-10% vs R410A)



#### RELIABILITY

- ▶ Use of **well-known components**
- ▶ Refrigerant circuit **reliability** is maintained

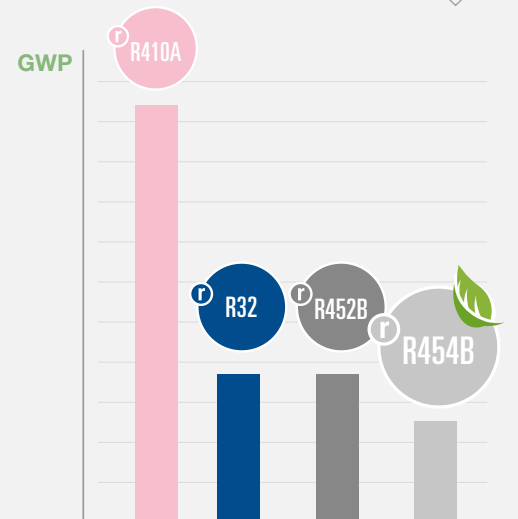


#### PERFORMANCE & ENVELOPE

- ▶ **Same operating limits** of R410A both in **cooling** and **heating**
- ▶ Higher efficiency (full load +3,5%, seasonal +2% vs R410A)

**GWP: 466**

**-76% vs R410A**  
**-31% vs R32**



### COMPLETE RISK ASSESSMENT

NR2-W-G06 is designed for indoor installations and R454B is an A2L refrigerant (mildly flammable), but safety is guaranteed thanks to a specific development that includes the following aspects:

- ✓ Complete risk assessment procedure in accordance with the most recent directives
- ✓ Refrigerant leak detector as standard equipment, capable of promptly reacting in case of leakage and cut-off the power supply from the unit
- ✓ New electrical panel, completely separated from the compressors compartment
- ✓ Improved ventilation of the enclosure
- ✓ Presence of Safety valves
- ✓ Compliance to the safety requirements of EN 378 for installation inside a plant room



**LEAK DETECTOR**

# TECHNOLOGICAL CHOICES

Advanced safety design and green refrigerant R454B are an ideal platform for IDV scroll compressors technology: the perfect combination for high seasonal efficiency.

## Electrical Control Box

W3000+ control software, available with standard keyboard or touch screen, features proprietary settings, to perfectly manage each single product dynamic.



**Compact keyboard** (STD)



**7 inch touch screen** (opt.)



**KIPLink** (opt.)  
Full access by simply scanning the QR code

## Structure and layout

NR2-W-G06 puts safety as first priority, and this critical aspect is achieved also by the introduction of the new electrical cabinet, completely isolated from the compressor compartment

This family is composed of 14 sizes, but all of them stay in the same **885 mm width**. The standard equipment already includes the polyester-painted galvanized steel panels for every size.



## New scroll compressors

New generation of fixed speed scroll compressors, developed for the use of A2L refrigerant R454B.

- ✓ **Uneven tandem** configuration that boosts the seasonal efficiency
- ✓ Intermediate Discharge Valve (**IDV**) that reduces excessive compression in part load operation



## Electronic expansion valve

Managed by proprietary dedicated logics, it guarantees an excellent flow control and a highly precise temperature control in every load condition.



## Plate heat exchanger

Brazed plate heat exchangers made of AISI 316 stainless steel, externally coated with an anti-condensation material in closed cell neoprene (CFC and HCFC-free) on the user side exchanger. Compact and efficient with reduced pressure drops.



DATI TECNICI:

**NR2-W** G06



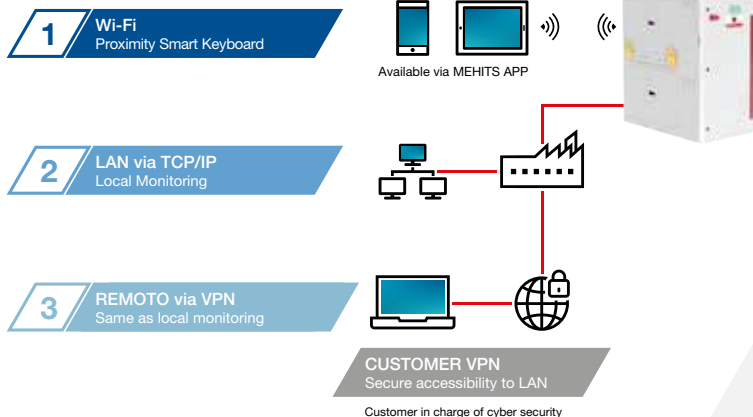
## KIPlink: LOCAL AND REMOTE MONITORING FUNCTIONS

An exclusive product of Mitsubishi Electric Hydronics & IT Cooling Systems.

Monitor and control the unit from a LAN device (PC, laptop, mobile phone) with a simple web browser.

### MAIN FEATURES

- ▶ Easier on-site operation
- ▶ Real-time graphs and trends
- ▶ Data logger function



## FOCUS ON: NR2-W-G06 FOR IT COOLING APPLICATIONS

- ✓ Increased **evaporation limits**, up to +25 °C ELWT
- ✓ HPC for the centralized control of complex cooling systems through LAN technology
- ✓ **MultiManager** for chiller group management
- ✓ Version -D available for **heat recovery**

### SMART LAN FUNCTIONS

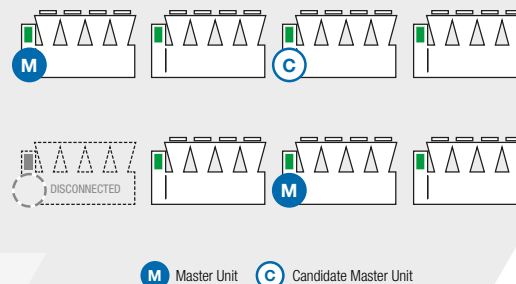
NR2-W-G06 features embedded LAN logics for an easy connection between a group of chillers.

- ▶ Up to 8 chillers connected to the same group.
- ▶ Load sharing and Sequencing.
- ▶ Selectable unit start-up sequence.
- ▶ Stand by unit management with automatic unit rotation.
- ▶ Dynamic master with succession priority.

One master unit is elected to coordinate the group and if it becomes disconnected the candidate unit takes full control.

- ▶ Resource priority management.

### MASTER SUCCESSION PRIORITY



## FURTHER OPTIONS

### Set-point adjustment

**4-20 mA:** Enables remote set-point adjustments (analog input).

**Double set-point:** Enables the remote switch between 2 set-points (digital input).

### Control functions

**External capacity cap:** Limits the unit's cooling capacity to a specific % value, by acting on active resources and their operating frequencies. The unit can exceed this limit in specific conditions.

**U.L.C. User Limit Control:** Controls a mixing valve (not included) to ensure a safe start-up and operation of the unit even in critical conditions.

**Remote probe:** Controls the unit's and pump's activation on the base of the water temperature of the buffer tank or hydraulic decoupler.

**Demand limit:** Limits the unit's power absorption for safety reasons or in temporary situations (digital input).

### Operating map

**Evaporator leaving water temperature < 5°C:** Enables evaporator leaving water temperatures at full load operation down to -10°C.

**Evaporator leaving water temperature > 18°C:** Enables evaporator leaving water temperatures at full load operation up to 25°C.

### Connectivity

Serial card interface module to allow integration with BMS protocols: **Modbus / BACnet MS/TP / BACnet over IP / Konnex / Modbus TCP/IP/ SNMP**

**Multi Manager:** options to allow easy connection between a group of chillers.

### Energy Meter

**Energy meter for BMS:** Acquires electrical data and the power absorbed by the unit and sends them to the BMS for energy metering (Modbus RS485).

**Energy meter for W3000:** The electrical data acquired is available directly on the unit's control.

### Acoustical enclosures

**Acoustical enclosure "plus":** Insulation on both compressors and inside the panelling of the unit for a -4 dB(A) reduction.

### Condensing Control with 0-10V signal

**0-10V signal for 2-way valve:** 0-10V signal on terminal blocks for the control of a 2-way valve

**0-10V signal for 3-way valve:** 0-10V signal on terminal blocks for the control of a 3-way valve

### Structure

**Rubber type anti-vibration mountings:** Reduce vibrations, keeping noise transmission to a minimum.

# “ BY FAR THE BEST PROOF IS EXPERIENCE ”

Sir Francis Bacon  
British Philosopher (1561 - 1626)

## MURATA ELECTRONICS

### 2018-2019 Vantaa – Finland

**Application type:** Electronic & automation, Industrial technology

**System type:** Hydronic System

**Installed Units:**  
2 FRCS2-W/CA-E 2802, 2x NR-W-Y 1204, 3x FRCS3-W 2602

**Cooling capacity:**  
4304 kW

#### PROJECT

Murata Electronics Oy, is part of the Japanese Murata Group. The company was acquired in 2012 and specializes in the development and manufacture of 3D MEMS sensors for safety critical applications. It is the only factory of Murata which manufactures MEMS sensors outside of Japan.

#### CHALLENGE

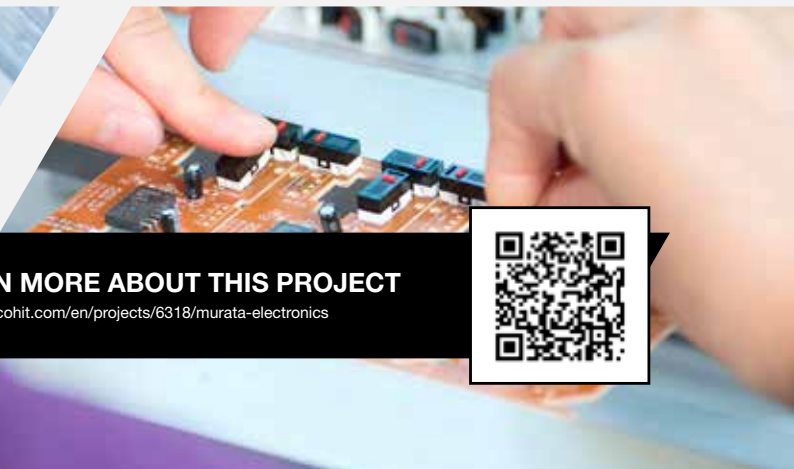
Murata, after having purchased the previously leased buildings, is constructing a new building of approximately 16,000 m<sup>2</sup>. The new facility is scheduled to be completed by the end of 2019. With the factory expansion in Finland, Murata will strengthen both R&D and manufacturing operations for increased production. The company employs 1000 people in Finland and estimates creating 150–200 new jobs. The company's philosophy is to contribute to the advancement of society through innovative technologies and solutions.

#### SOLUTION

When it came time to choose a HVAC system for the process cooling, Murata chose a system based on 7 RC brand chillers. Specifically, 2 FRCS2-W/CA-E 2802 premium efficiency Class A units, 2 NR-W-Y 1204 water to water units for the production of chilled water, and 3 FRCS3-W 2602 water cooled screw compressor units, for a total cooling capacity of 4304 kW. These units offer EER values up to 5.6 at Eurovent standard conditions.



RC's chillers, with their unbeatable advantages in terms of efficiency, quality, and precision are already the preferred choice of the major brands in the most prestigious projects all over the world.



**TO LEARN MORE ABOUT THIS PROJECT**

<https://www.melcohit.com/en/projects/6318/murata-electronics>



# MORE THAN 1000 PROJECTS ALL OVER THE WORLD

## TECNOPOLO BOLOGNA

2018-2019 Bologna – Italy

**Application type:** Mixed-Use  
Development, Offices, Residential  
buildings, Data Center

**System type:**  
Hydronic System, Air to Air System,  
HPAC System

**Cooling capacity:** 6490 kW

**Heating Capacity:** 566 kW

**Air flow:** 13005 kW

**Installed Units:**

2x NRCS-WQ 0904, 2x NR-W 0252,  
1x WIZARD 1720, 2x WIZARD 2080,  
3x ClimaPRO, 9x i-FR-G05-Z/E/S  
3602, 28x w-NEXT2 K E8 U 180

### PROJECT

The real estate complex of the former tobacco factory, owned by the Emilia-Romagna Region, will become the headquarters of the new Tecnopolo in Bologna: a center for innovation and experimentation. It will host various institutions and the data center for the European Centre for Medium-range Weather Forecasts, setting up itself as a European climate change research hub.

### CHALLENGE

The comfort in the ECMWF offices and the cooling of the ECMWF data center are managed by a single joint HVAC system, designed to ensure maximum efficiency with reduced environmental impact.

### SOLUTION

Specifically, there are 28 w-NEXT 2 K 180, RC branded hydronic close control units for the server rooms, 2 NX-W/ N 0262 heat pumps, 2 NECS-W/ Q 0904 multipurpose heat pumps, 3 WZ-E air handling units, all of which are Climaveneta branded, for year-round conditioning of the offices, and 9 RC branded i-FR-G05-Z/E/S 3602 screw inverter air source chillers, dedicated to cooling the supercomputer.





**TO LEARN MORE ABOUT THIS PROJECT**

<https://www.melcohit.com/en/projects/6434/tecnopolo-bologna>





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