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Non-Freon Snow Melting Heat Pump

~ Heat pump specification and delivery examples ~

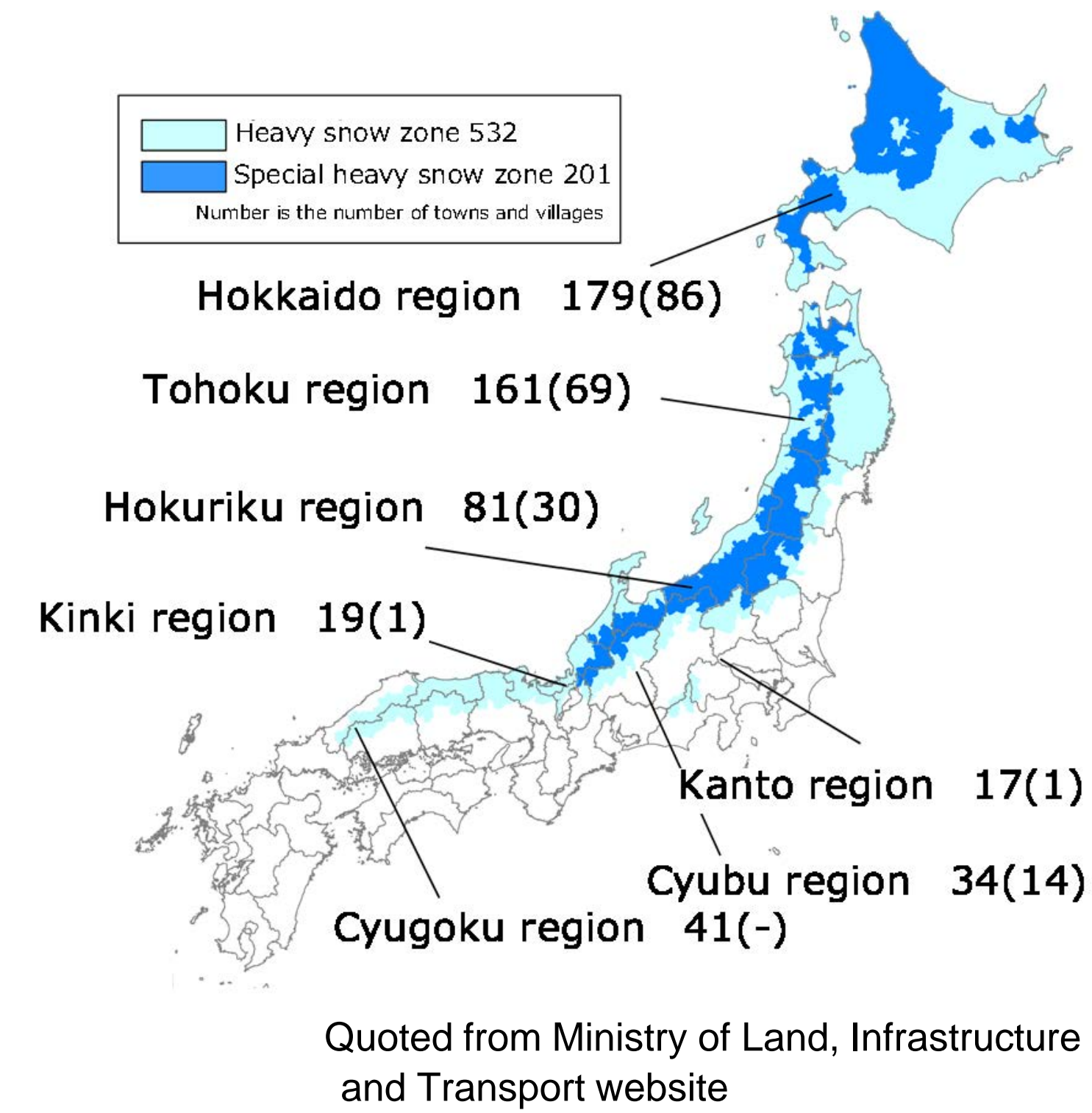
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- In Japan, half of the country is designated as snow falling area (24 Prefectures, 532 municipalities)
- In snowy cold districts, various measures are taken to reduce obstacles due to snow
- However, the environment surrounding the regions such as population decrease and aging is severe

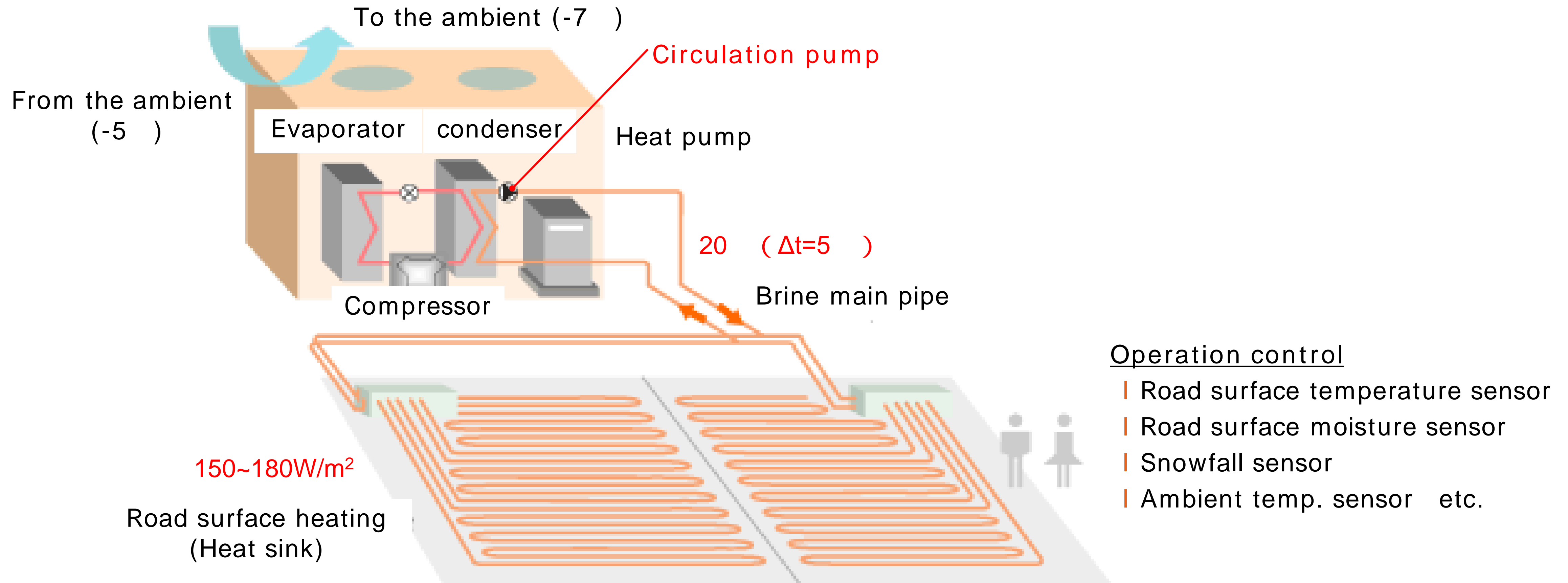
Ensuring safe living environment in winter,
 To maintain and develop the vibrant communities,
 Securing smooth road traffic in winter is indispensable



Snow melting / elimination facilities play an important role

- Since the first delivery to Aomori City in 1981, over 270 MYCOM snow melting heat pumps have been installed.
- The initial Freon refrigerant facility is under renewal due to aging and excessive service life.
- We have an obligation to make appropriate renewal proposals as soon as possible.

Snow Melting heat pump system



Technical content

Concept

- Adopted a natural refrigerant "CO₂" ,friendly to the global environment and not subject to Freon regulations.
- A compact, modular type, high performance, low cost snow melting heat pump unit.
- A snow melting system that reduces the total cost and does not require time and effort for maintenance.
- Flexible expansion by installing multiple units in large-scale area (risks are dispersed even in case of failure).
- The circulation pump and auxiliaries are all built-in with combined system control unit.

Points

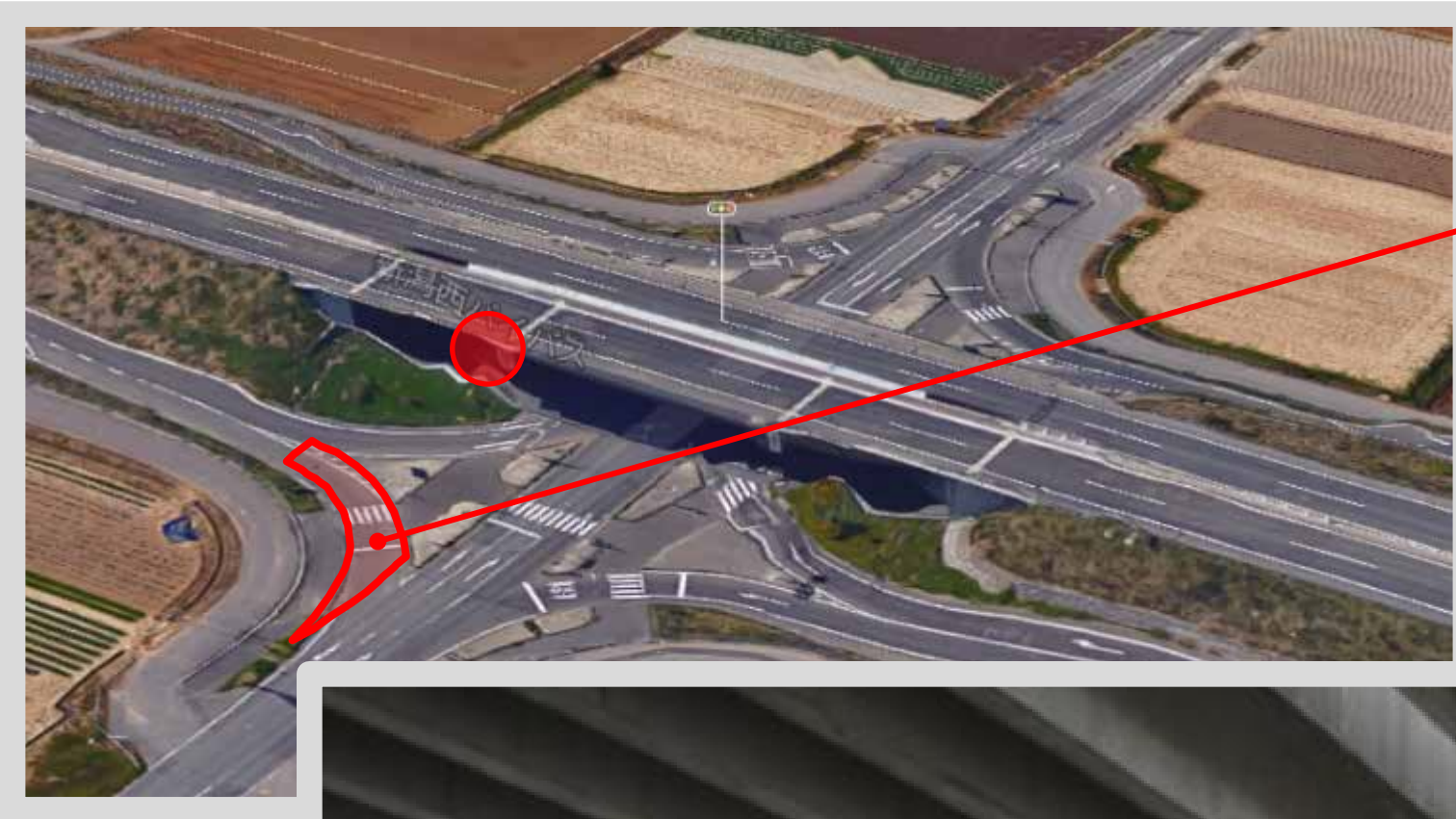
- Apply sub-critical system to realize highly efficient circulation heating.
- Improvement of equipment efficiency by improving the compressor exclusively for snow-melting machines and optimally designing the heat exchangers.
- Minimization of refrigerant charge, optimization of operation control to make the system highly efficient.
- Improve maintainability by standardizing equipment, control and simplifying the system.
- Since the power for snow melting can not be energized in summer, a structure that can cope with temperature and pressure rise

Air heat source snow melting heat pump unit specification



Model	SAW-2HTCR-11
Refrigerant	R744 (CO ₂) , 16kg
Heating capacity	48kW (Amb. temp. : -5 . , Brine : 15 →20 .)
External dimensions	W2,100 × L1,100 × H2,105
Weight	1,344kg (Charged : 1,359kg)
Compressor motor	11kW × 4P (Inverter starting)
Fan	0.75kW × 2
Defrost method	Hot gas defrost
Operating range	-15 ~ +10 .
Brine outlet temp.	standard : 20 (maximum : 25)
Power supply	3Φ AC200V 50Hz/60Hz

Delivery example 1



Snow melting area



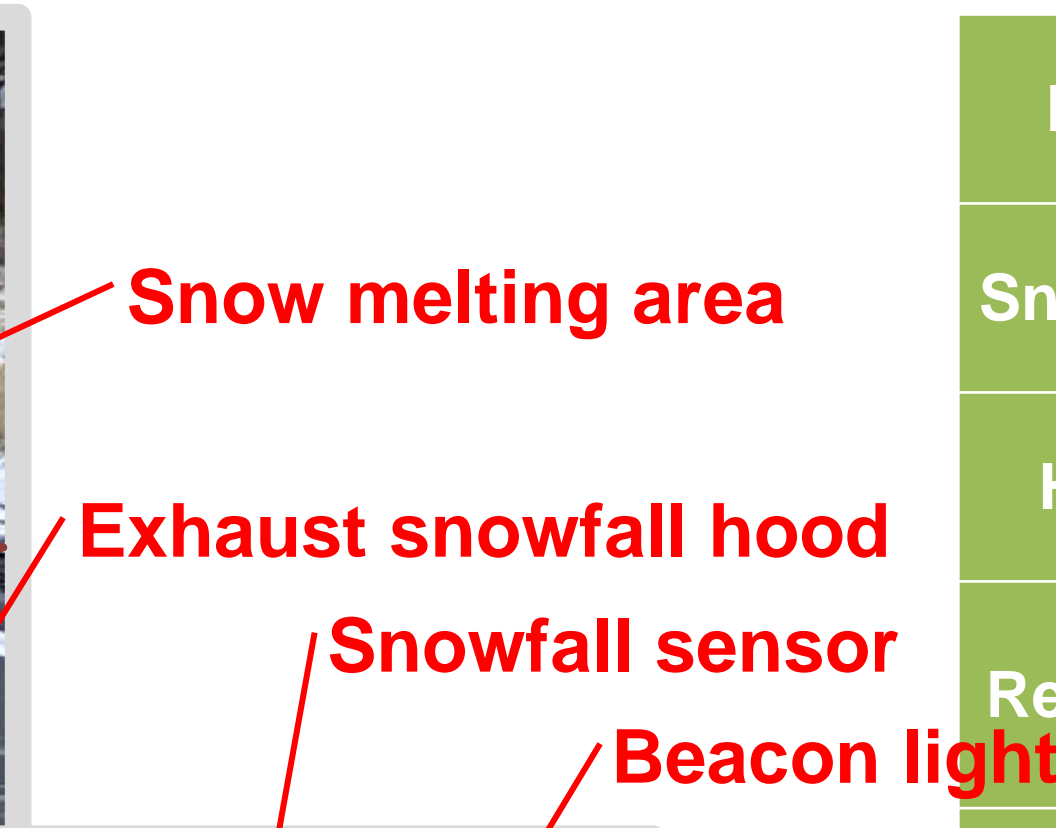
Weather cover

Heat pump unit

Delivery place	Niigata Prefecture (Newly established)
Snow melting area	National Road Interchange (roadway)
HP installation	Under the bridge
Required Capacity	124 kW or more (Amb. temp. : -0.6 . , Brine : 9.5 . or more)
Delivered equipment	HPU×3 + SSU×1
Option	With weather cover
Power	Low voltage power
Operation control	4 elements (Road surface temp. , Road moisture , snowfall , Ambient temp.)
Other	Remote monitoring and forced suspension can also be performed using optical lines Beacon lights set up by the road side

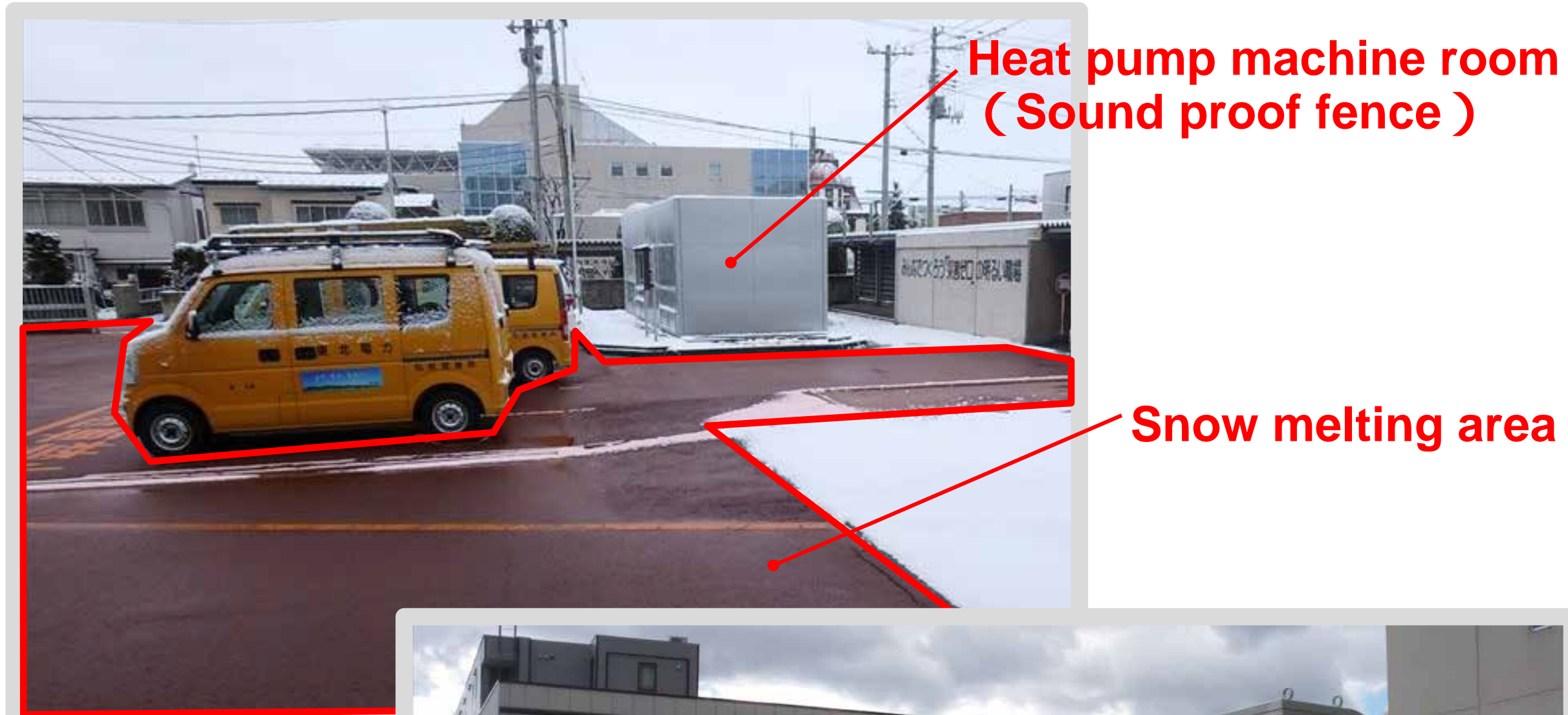
System control unit (Pump : 7.5kW)
Expansion tank

Delivery example 2



Delivery place	Iwate Prefecture (Newly established)
Snow melting area	Tunnel entrance of car exclusive road (roadway)
HP installation	Beside the electric room for tunnel
Required capacity	62 kW or more × 2set (Amb temp. : -6.0 , Brine : 15 or more)
Delivered equipment	(HPU×2 + SSU×1) × 2set
Option	Snow hooded (Suction and exhaust)
Power	Two facilities with low voltage power respectively
Operation control	4 elements (Road surface temp. , Road moisture , snowfall , Ambient temp.)
Other	Contact state output to machine room Put beacon light on the system control unit

Delivery example 3



Heat pump unit



Delivery place	Aomori Prefecture (Replacing existing HP)
Snow melting area	Parking Lot
HP installation	In the parking lot
Required Capacity	144 kW or more (Amb temp. : -5.0 °C, Brine : 20 °C or more)
Delivered equipment	HPU×3 + System control panel AC Converter Power Control Panel (3 HPU)
Option	Intake air snow cover with hood, Converter specification
Power	From buildings (high voltage)
Operation control	3 elements (Road surface temp., Road moisture, Ambient temp.)
Other	Separate circulating pump and accessories

Conclusion

- MYCOM developed a compact, high-performance, low-cost "non-freon air source type snow melting heat pump" using CO₂ as the refrigerant.
- We have delivered a total of 25 units since the start of sales in April 2015.
- The heat pumps are running smoothly, demonstrating sufficient snow melting functions and have received good evaluations from our customers.
- Although we currently have the air source type now, we are developing "non-freon water source type snow melting heat pump" because there is demand for water source, geothermal and exhaust heat recovery heat pump applications.



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Thank you very much!