Panasonic
BUSINESS

CO2 REFRIGERATION

OCU-CR2000VF8A
Product Introduction

2024/02/09

heating & cooling solutions

Why CO2?

Panasonic

CO2 is green, safe, economical, and free from any long-term health concerns.

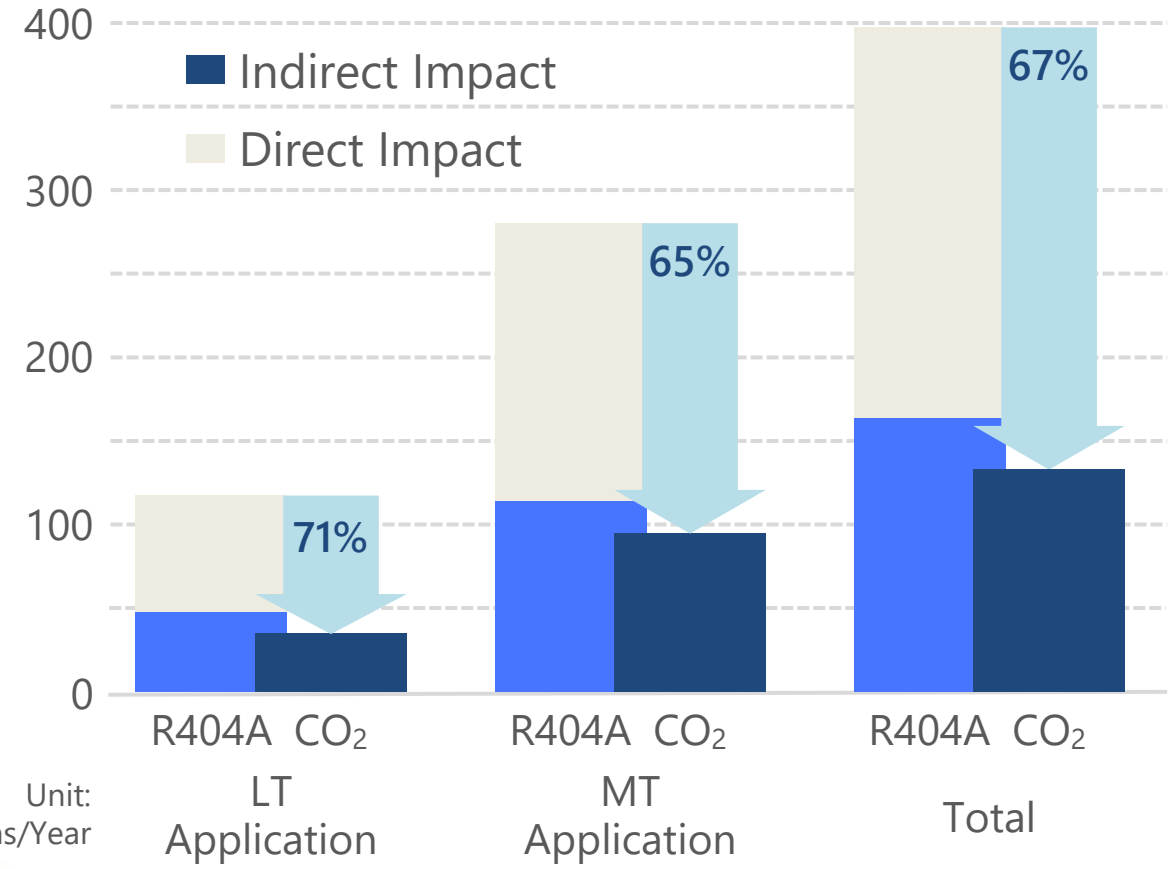
➢ **Future-proof solution** for wide range of application

Refrigerant	Type	GWP	Flammability	Toxicity	Efficiency	Availability
CO2	NatRef	1	No	No	★★★	✓
Ammonia	NatRef	0	Mild	High	★★★	✓
R290	NatRef	3	High	No	★★☆	✓
R404A	HFC	3,920	No	No	★☆☆	?
R488A	HFC Blend	1,386	No	No	★☆☆	?

Why CO2?

Panasonic

Time-tested Efficiency



Energy Saving

25.4% for LT Applications

16.2% for MT Applications

CO2 Emission Reduction

67% in Total

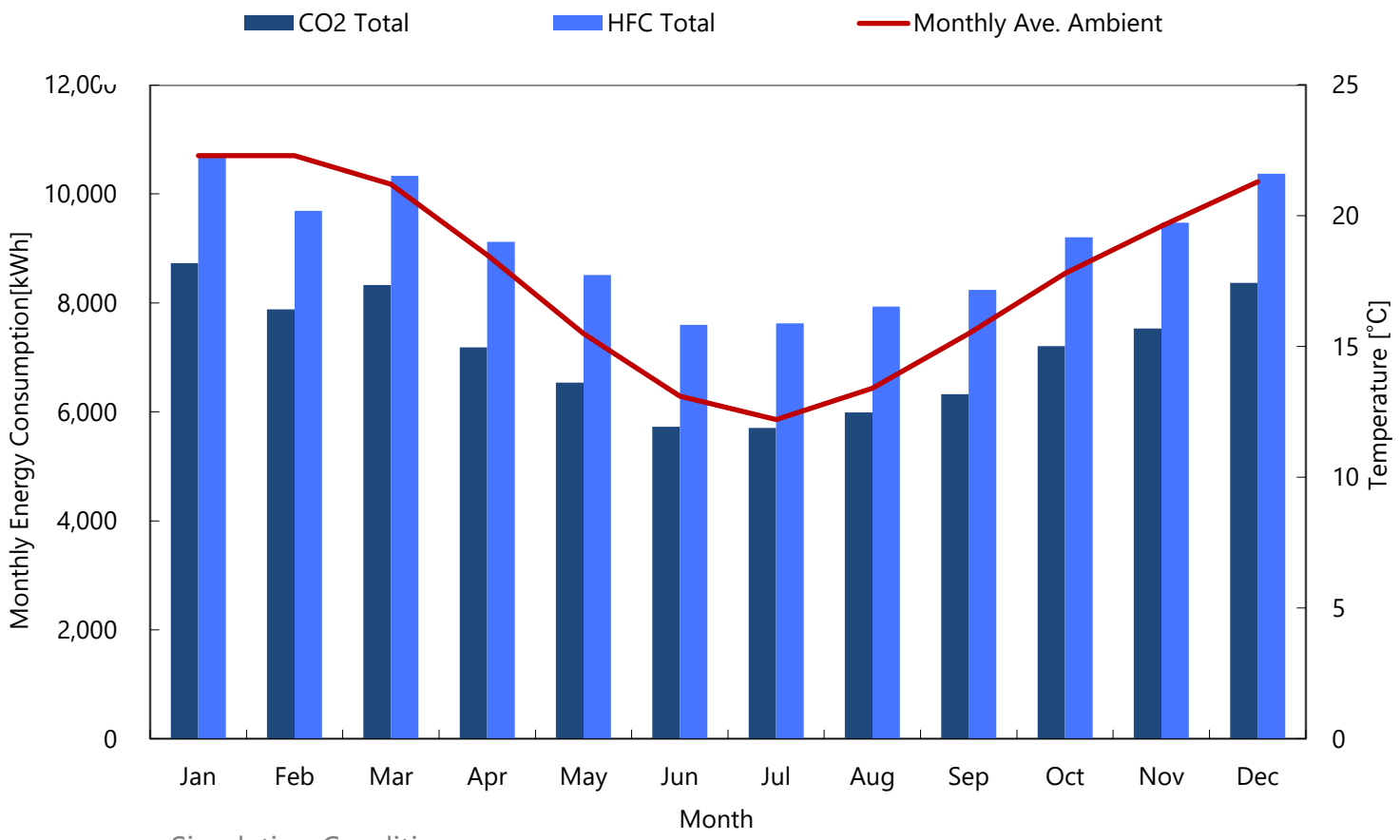
Test Conditions

1. Research conducted by Panasonic in 6 sample stores in Japan
2. Comparison with a similar-size R404A AC inverter OCU
3. Electricity-CO2 conversion coefficient: 0.000579t-CO2/kWh
4. Refrigerant Leakage Rate: 16% per Annum

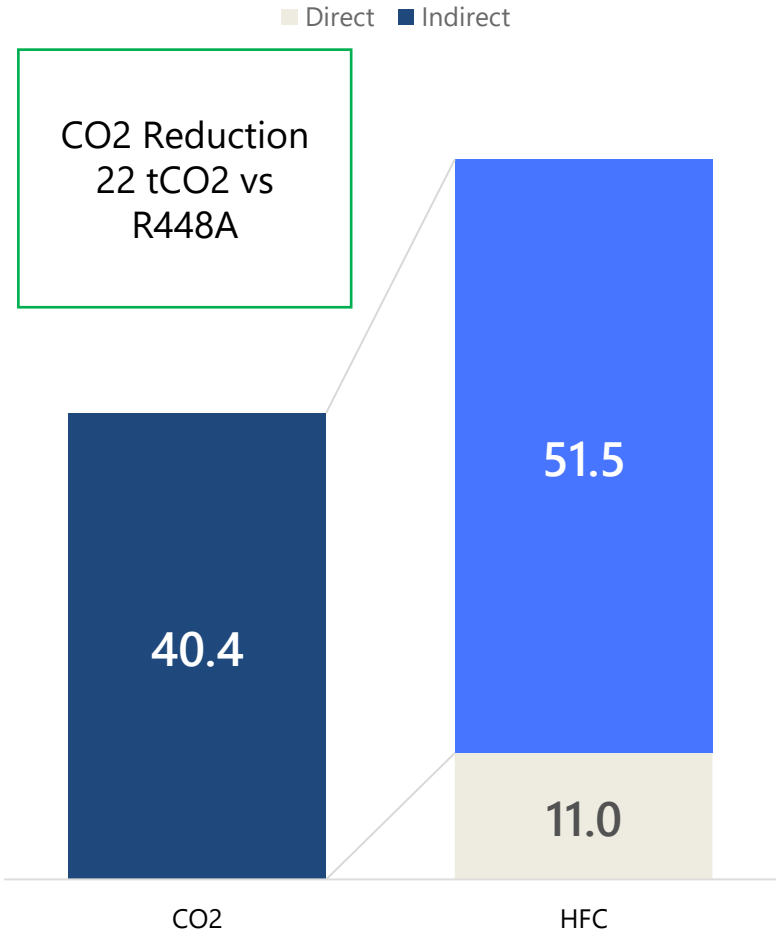
Why CO2?

Panasonic

Energy Consumption Simulation vs R448A in Sydney



CO2 Emission Simulation



Simulation Conditions:
Comparison with Panasonic CO2 OCUs and equivalent R448A inverter models. Cooling Duty 30kW for MT and 15kW for LT.
Annual leakage rate 5%. Electricity-CO2 conversion coefficient: 0.000579t-CO2/kWh.

Why Outdoor Condensing Unit?

Panasonic

No Machine Room

= **Value Adding Area Only**

Why Outdoor Condensing Unit?

Panasonic

Quiet, Small, Light, Long Piping Available, and All-Weather Design

Perfect Match for **Small-Middle Stores in Urban Areas**



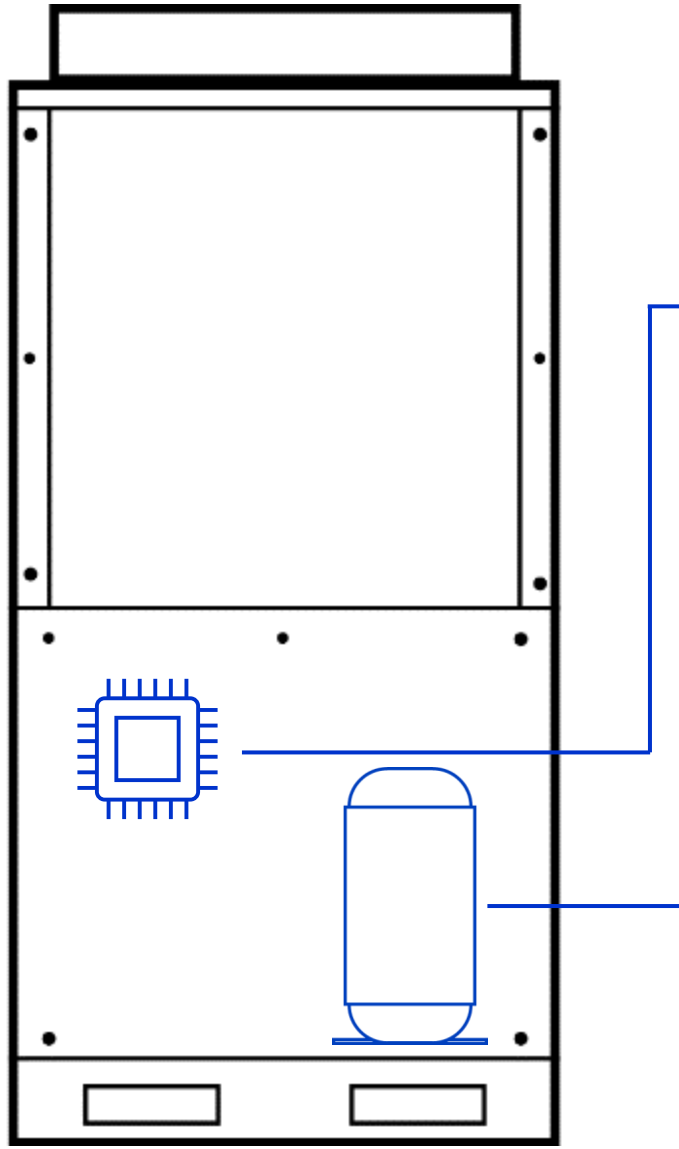






Why Panasonic? – Deep Knowledge

Panasonic



Brain = Invertor Control Algorithm

Designed and Programmed by Panasonic

Harmonized Development

Heart = CO2 2-Stage Rotary Compressor

Designed by Panasonic

Why Panasonic? – Outstanding Performance

Panasonic

Installation Flexibility from Wide AT/ET Range, Low Noise, Small Body
Best-in-Class Capacity and Efficiency

	Panasonic	Daikin	SCM Frigo	
	OCU-CR2000VF8A	LREN12A7Y1B	UMMT 190 MTDX	UMMT 120 BTDX
Compressor	**Panasonic Rotary x 2**	Daikin Swing Rotary x 3	Dorin Semihermetic x 1	
Ambient Temperature	**-20℃ to +45℃**	-20°C to +45°C	TBC	TBC
Evaporating Temperature	**-45℃ to -5℃**	-40°C to +5°C	TBC (MT Only)	TBC (LT Only)
Cooling Capacity MT (AT = 32°C / ET = -10°C)	**28.7 kW**	26.3 kW	30.8 kW	NA
COP MT (AT = 32°C / ET = -10°C)	**1.83**	1.69	1.74	NA
Cooling Capacity LT (AT = 32°C / ET = -35°C)	**14.7 kW**	15.5 kW	NA	11.0 kW
COP LT (AT = 32°C / ET = -35°C)	**1.10**	0.92	NA	1.13
Sound Pressure (at 10m)	**38.9 dB(A)**	44.0 dB(A)	45.0 dB(A)	50.0 dB(A)
Max Piping Length	**100 m**	50 m	TBC	TBC
Dimension (mm) (W x D x H)	**1,190 x 890 x 1,941**	1,930 x 765 x 1,680	1,895 x 760 x 1,485	1,340 x 760 x 1,485
Weight	**494 kg**	547 kg	655 kg	560 kg

Why Panasonic? – Outstanding Performance

Panasonic

Wide and Seamless Product Line-up to Meet All Your Needs

Cooling capacity (kW)	MT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	LT	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9
Panasonic CO2 CR Series	2HP MT / LT (200VF5/200VF5A)			MT / LT																
	4HP MT (400VF8)					MT	HR													
	4HP MT / LT (400VF8A)						MT / LT	HR												
	10HP MT (1000VF8)												MT	HR						
	10HP MT / LT (1000VF8A)												MT / LT	HR						

MT:  (4HP) ≈  × 4 (3,750mm Wide 6 Doors Multideck Cabinet)

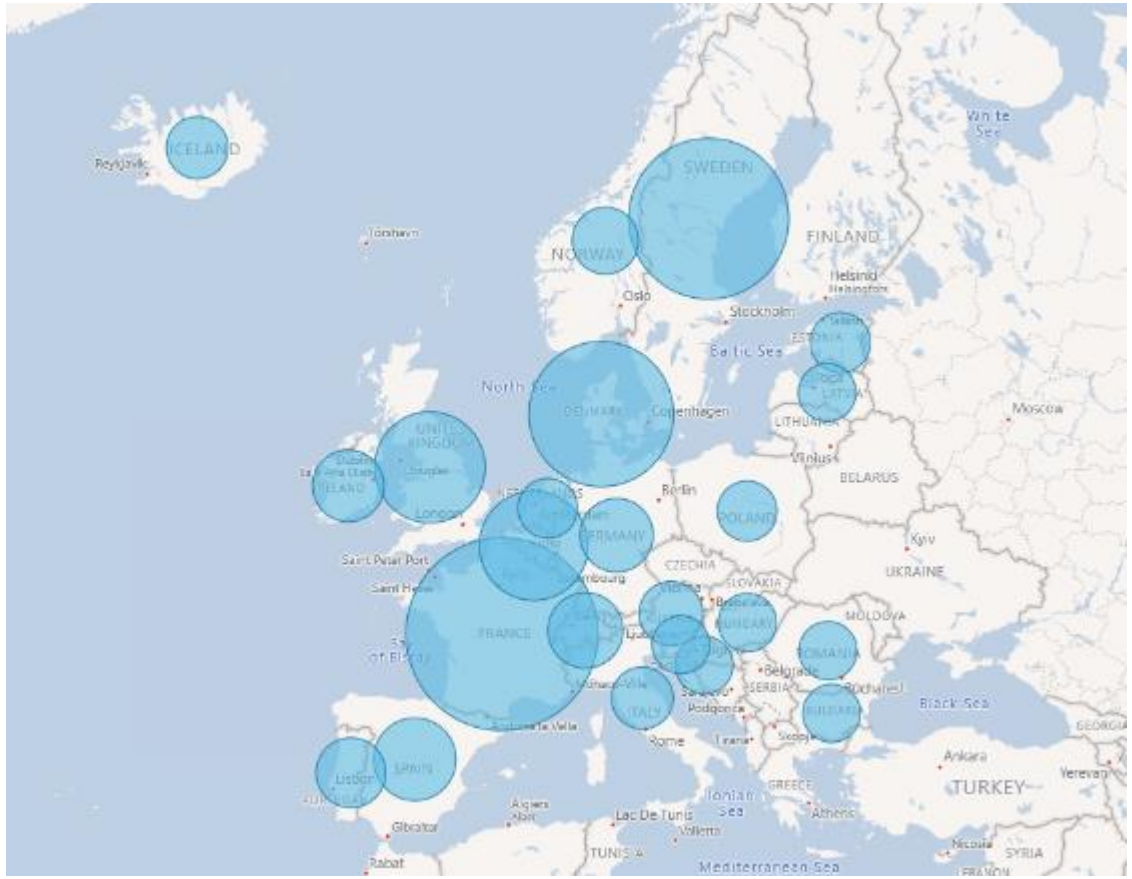
LT:  (4HP) ≈  × 2 (3,122mm Wide 4 Doors Reach-in Cabinet)

Note:
This is for reference purpose only and OCU selection needs to be conducted carefully considering the total cooling duty of the system

Why Panasonic? – Proven Reliability

Panasonic

360-Degree Evaluated in Lab, 100% Tested in Factory, Proven Globally



Over 25,000 Supplied Globally

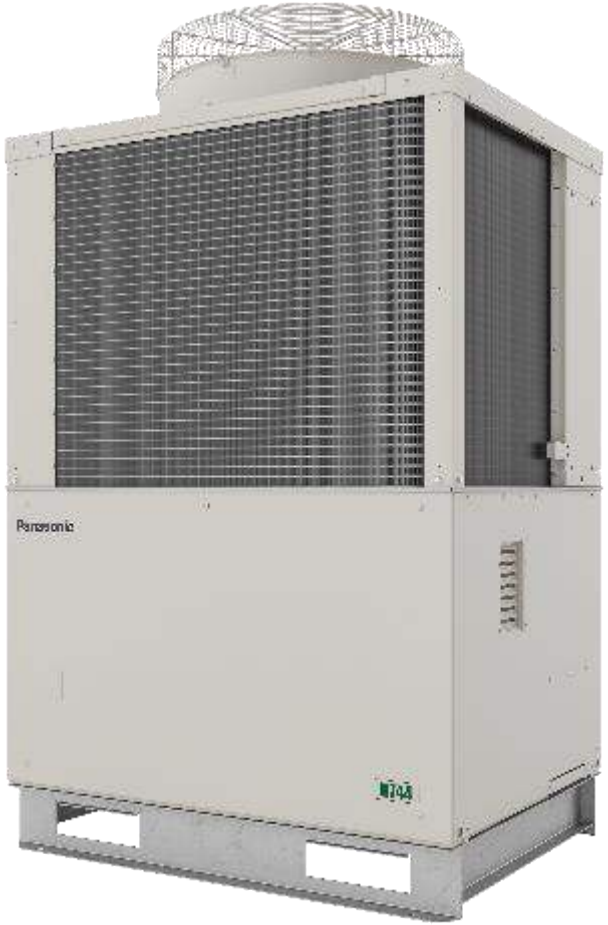
- Cover-all tests in the R&D phase
  Cooling performance, noise level, physical robustness, weather proofness, and more
- Every single unit tested on the production line
  Leakage, electrical insulation, wiring, operation
- All terrain reliability from -30C blizzard in Sweden to +53C heatwave in Spain

20HP Product Specifications

Panasonic

Model	OCU-CR1000VF8A	**OCU-CR2000VF8A**
Power Supply	3phase 4wire 380V/400V/415V 50Hz	3phase 4wire 380V/400V/415V 50Hz
Dimensions	1,941×890×890mm	1,941×**1,190**×890mm
AT Range	-20°C～43°C	-20°C～**45°C***
ET Range	-45°C～-5°C	-45°C～**-5°C***
Compressor	EU model 10HP ×1	EU model 10HP **×2**
Fan motor	EU 10HP	EU 10HP
Refrigeration System	Single Compressor System	Multi-Compressor System
Electrical System	Yaskawa INV CR2M PCB	Yaskawa **New** INV CR2M PCB
Cooling Capacity (ET-10°C)	15.1kW	28.7 kW*
Cooling Capacity (ET-35°C)	8.0kW	14.7 kW*
PED Category	CAT2	CAT2
Receiver Tank	Temprite 10.7L	Temprite 10.7L **x2**

*Target Values



Cooling Performance

Panasonic

Ambient Temperature	Item	OCU-CR2000VF8A		OCU-CR1000VF8A	
		ET -10°C	ET -35°C	ET -10°C	ET -35°C
	Seasonal Energy Performance Ratio (SEPR)	3.10	1.64	2.86	1.49
32°C	Rated Cooling Capacity	28.74	14.73	15.10	8.00
	Rated Power Input	15.67	13.45	8.20	7.57
	Rated COP	1.83	1.10	1.84	1.06
25°C	Rated Cooling Capacity	30.36	15.34	15.20	8.40
	Rated Power Input	13.01	13.23	7.20	6.50
	Rated COP	2.33	1.16	2.11	1.29
15°C	Rated Cooling Capacity	31.70	16.06	15.60	8.60
	Rated Power Input	10.75	9.94	5.60	5.60
	Rated COP	2.95	1.62	2.79	1.54
5°C	Rated Cooling Capacity	34.54	16.42	15.80	8.60
	Rated Power Input	8.99	8.50	4.55	5.55
	Rated COP	3.84	1.93	3.47	1.55
43°C	Rated Cooling Capacity	25.48	13.32	12.40	6.90
	Rated Power Input	16.90	16.02	9.28	8.90
	Rated COP	1.51	0.83	1.34	0.78

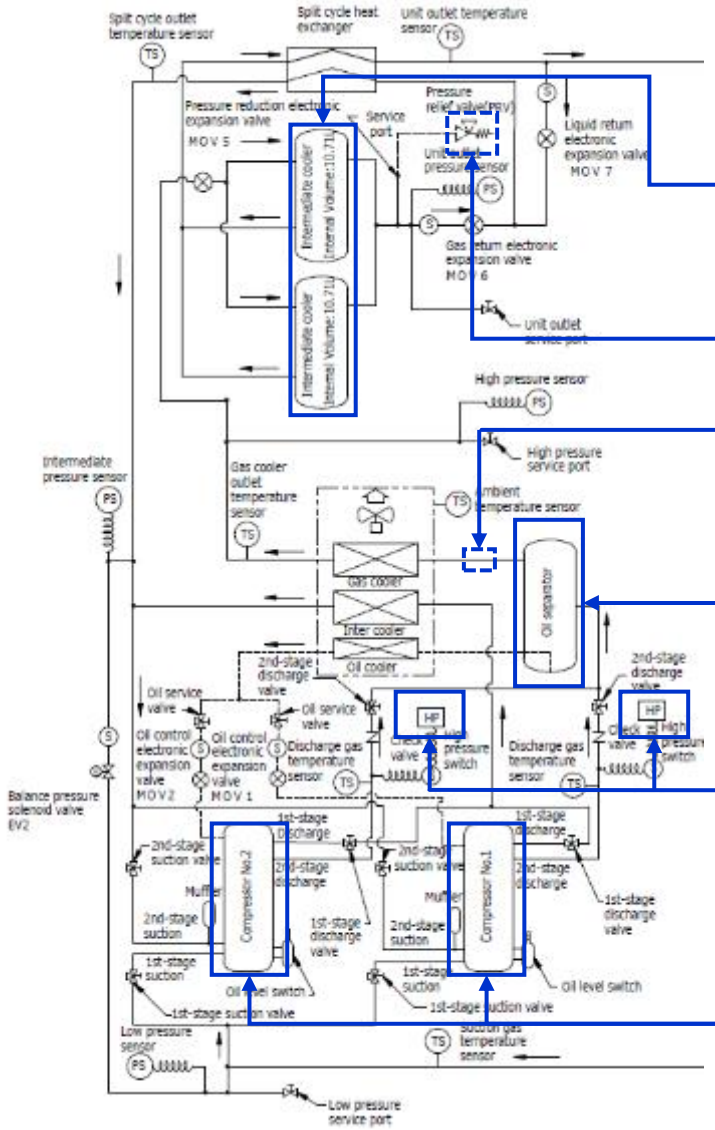
vs 10HP

200% Cooling Capacity

110% Efficiency

Test Conditions:
Voltage = 400V, Suction Superheat = 10K, Compressor Speed = 120Hz for OCU-CR2000VF8A and 60Hz for OCU-CR1000VF8A

Refrigeration Cycle



2 x 10.7L Temprite Tank in parallel

PRV Port directly connected to the Receiver Tanks

Heat Recovery Port

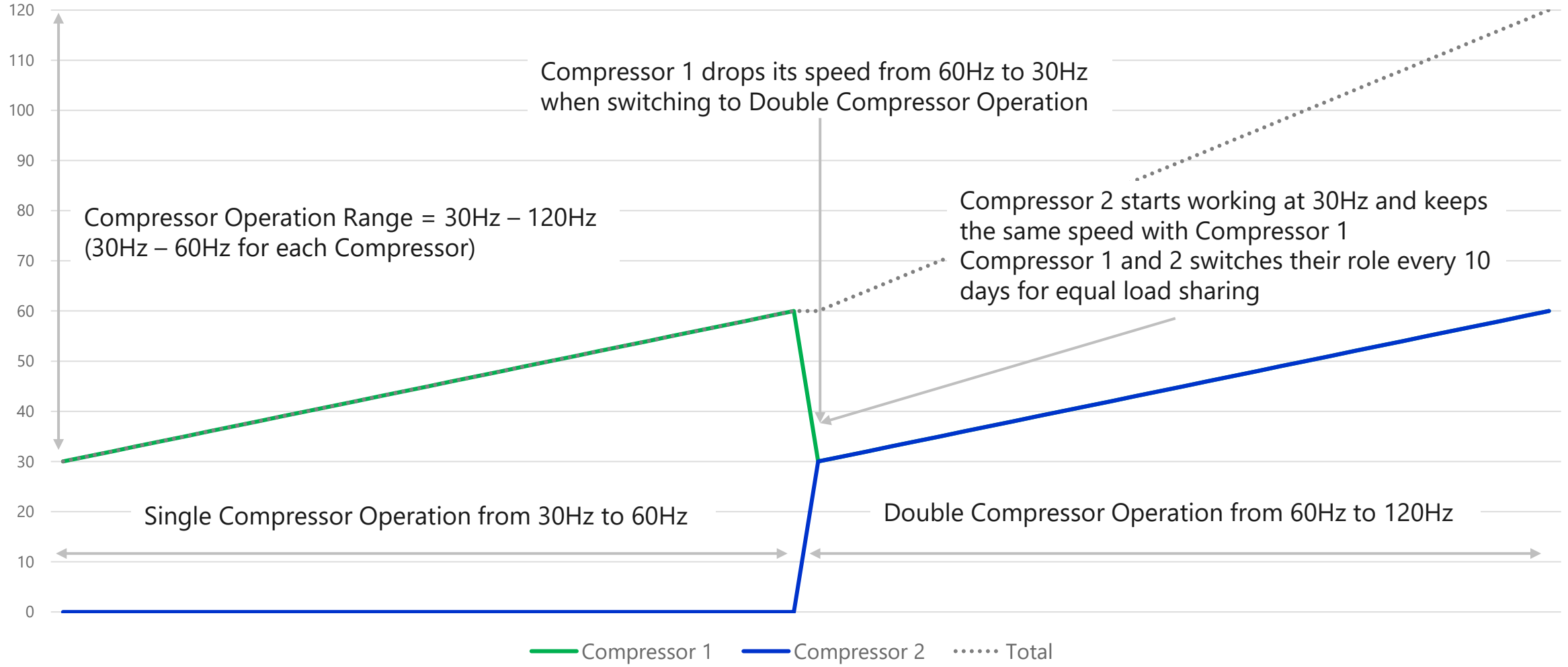
Oil Separator
Oil return is controlled by the oil level of each compressor

High Pressure Switch for each Compressor

2 x 10HP Compressor
with Oil Level Sensor for each Compressor

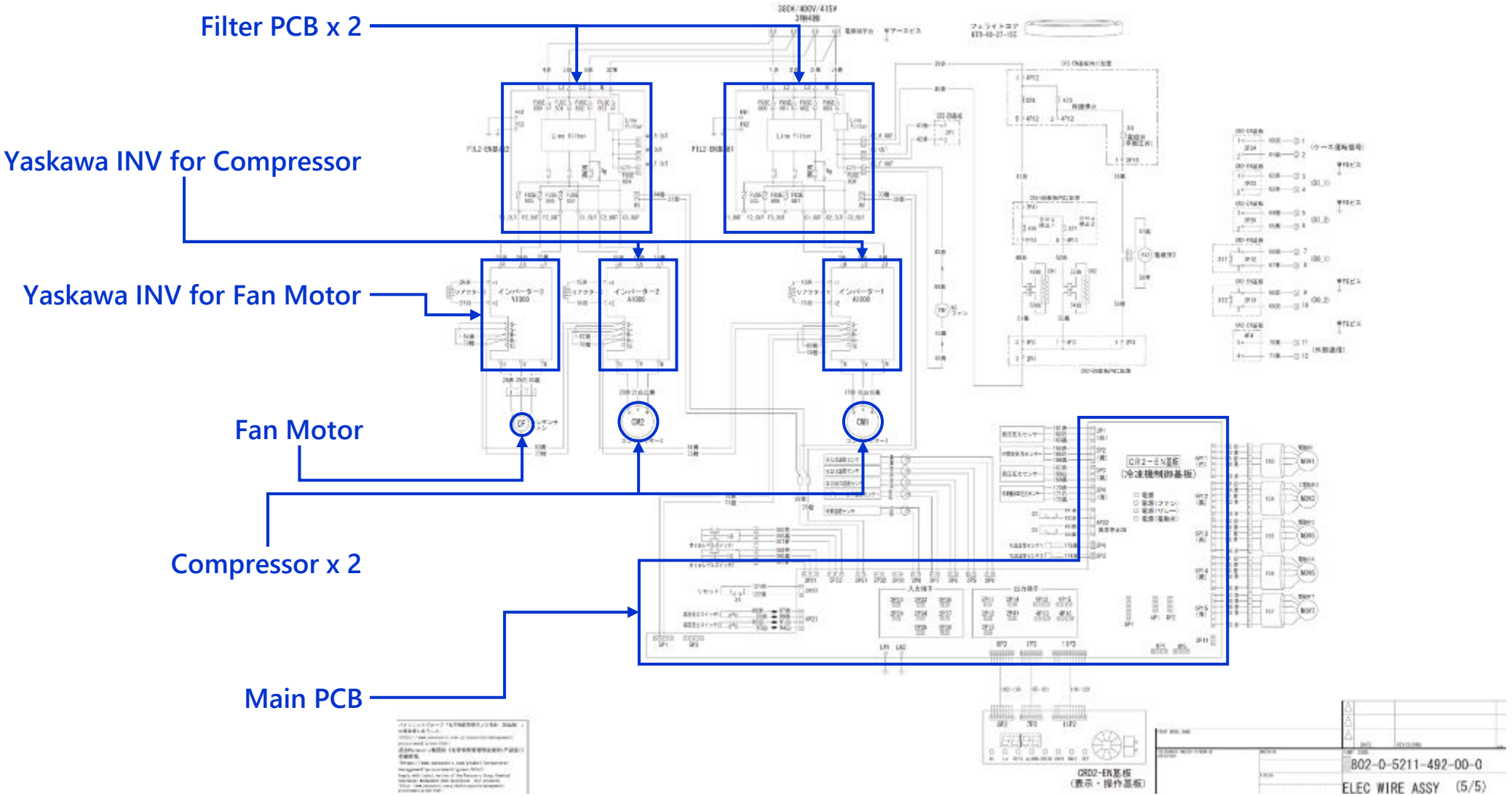
Compressor Operation

Panasonic



Electrical Cycle

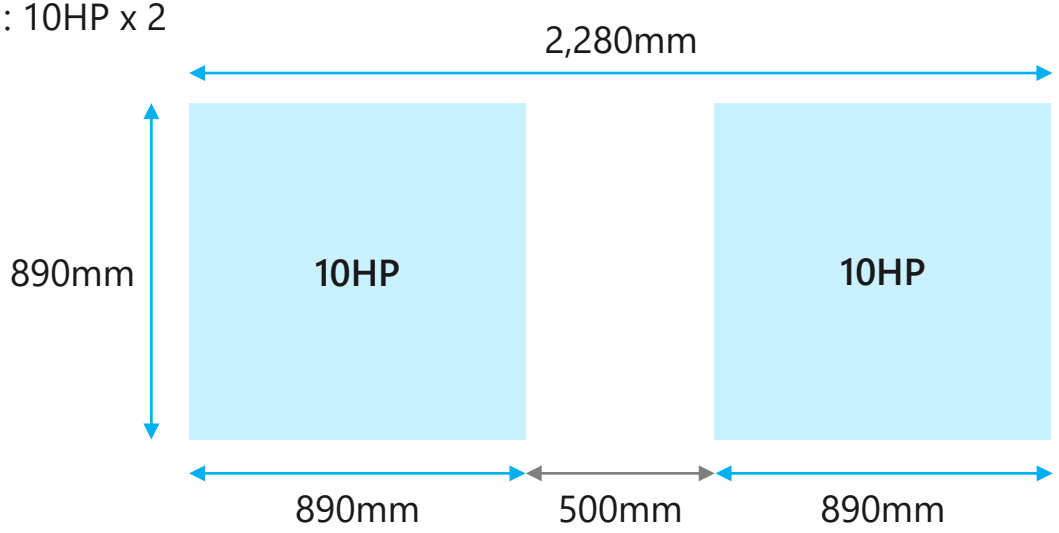
Panasonic



Footprint Reduction

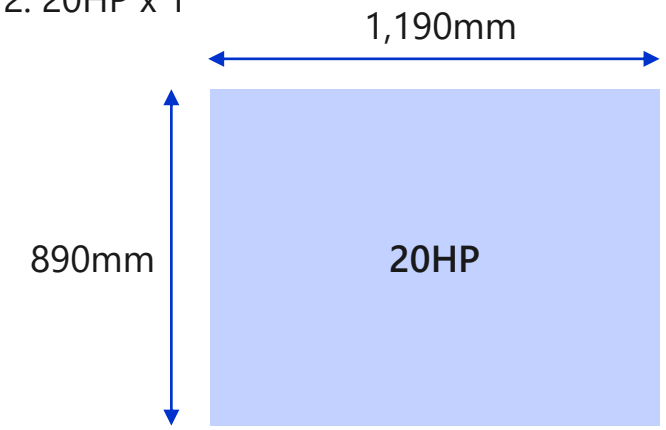
Panasonic

Case 1: 10HP x 2



= 2.03m2

Case 2: 20HP x 1



= 1.06m2

48% Reduction

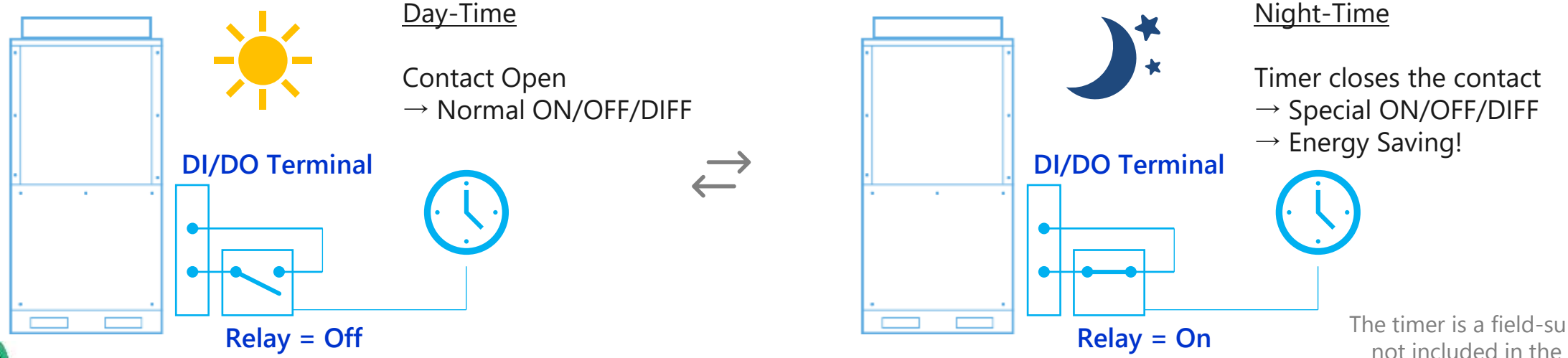
Digital Input / Digital Output (DI/DO)

Panasonic

	Name	Function	Usage Example
Input 1	Energy Saving	Switch to another **ON*/OFF*/DIFF*** set when the contact is closed	Raise the ON value at night by a timer
Input 2	Silent Mode	Change to fan motor operation to the silent mode when the contact is close	Activate the silent mode at night by a timer
Output 1	High Temp	Close the contact when the AT is above the **target temperature***	Activate an adiabatic spray when AT is above 32C
Output 2	Low Temp	Close the contact when the AT is below the **target temperature***	Activate a heater when AT is -20C

*These values are configurable in a Back Mode

Usage Example: Input 1/Energy Saving



The timer is a field-supply, not included in the OCU