



Epta

Advanced Solutions for your Store

Sales Aid Arguments Propane Units:  
DropIn

# PROPANE AS A REFRIGERANT

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## What propane makes possible in refrigeration technology

Propane belongs to the halogen-free, organic hydrocarbons and is a highly flammable, colourless and odourless gas. In refrigeration technology, it is a hotly debated topic due to its flammability. In everyday life, however, it is precisely this property that makes hydrocarbons so interesting for the catering industry, the leisure industry and the commerce. Gas bottles of various sizes supply herds, barbecues and camping equipment. Hydrocarbon-powered heaters provide warm outdoor comfort in the cold season. It is used as a car gas to drive vehicles and even in the supermarket it can be found in lighters or as a propellant in spray cans. Hydrocarbons such as propane or isobutane are therefore indispensable in our everyday lives.

## Side-product from natural gas extraction

Propane or R290, as the refrigerant name is called, is optimized in a special cleaning process before it is used in refrigeration systems. It is mainly obtained as a by-product of natural gas extraction and oil cracking. The thermodynamic and physical refrigerant properties of R290 are to be classified as good:

- very good pressure layers (below 28 bar)
- efficient operation in winter and summer
- Very wide range of applications: evaporation temperatures from -40 degrees Celsius to +15 degrees Celsius
- Temperature glide of 0 Kelvin
- very good material and mineral oil compatibility

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However, R290 is classified in safety class A3 due to its highly flammable properties. It has low toxicity with high combustibility. This in turn means that the refrigeration system has to be constructed very elaborately in order to comply with all explosion protection regulations. Larger refrigeration systems with R290 are therefore mainly in operation in the industrial sector, where higher safety measures have to be observed anyway due to the size of the plant. Propane is much more commonly used in compact systems. With filling quantities of 150 grams per refrigeration circuit, the regulations do not apply.

## Ideal for plug-in cabinets or small condensing units

Propane is a very environmentally friendly refrigerant with no **O**zone **D**epletion **P**otential (ODP of 0) and with a low **G**lobal **W**arming **P**otential (GWP value of 3).

Devices with hydrocarbons as refrigerant and a filling volume of up to 150 grams are available for many applications and are completely standardized. These refrigeration units usually achieve even better energy efficiency than comparable devices with fluorinated refrigerants. Small units so-called plug-in-cabinets, which, like household refrigerators, carry the complete technology inside, are used in commercial refrigeration. The condenser on the refrigerated cabinet provides the waste heat directly to the environment. This is a measurable advantage in the heating periods due to direct heat recovery. In the summer months, however, this additional heat input has to be dissipated by air conditioning and the room air as heat carrier. Here, the so-called semi-plug-in devices can play out their advantage: A water circuit absorbs the waste heat of all refrigerated cabinets via water-cooled condensers and releases them back to the ambient air at a higher temperature level.

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## The future in refrigeration is called “natural refrigerants”

Plug-in-ready units with propane are already indispensable in the refrigeration industry. In Europe, all newly installed plug-in-ready refrigerated cabinets in supermarkets are cooled with the natural refrigerant Propane. There are no significant alternatives that can compete with hydrocarbons in terms of efficiency and environmental protection. This is unlikely to change in the future. And also for coldrooms and their small condensing units Propane is the refrigerant of your choice if you emphasize with the environment and energy efficiency.

## Reform of IEC 60335-2-89

Thanks to the positive coordination in the field of flammable refrigeration, more than 150g of propane may be used in the future for one refrigeration circuit. However, taking into account various safety precautions.

Epta considers the introduction of this new standard as an opportunity for a broader use of climate-friendly refrigerants worldwide, giving a significant contribution to the mitigation of climate change.

At the moment all Epta self-contained units using propane as a refrigerant are on the limit of 150gr per circuit: we are currently assessing the potential for products with higher charge limits, in order to plan new product developments according to the market requests.



## WHAT IS DROPIN?

### Compact condensing unit attached to a coldroom ceiling

Drop In is an aircooled compact condensing unit for MISA coldrooms.

Easy to assemble it to a ceiling of a coldroom. One part, the evaporator, is attached to the inner site of the ceiling. Outside, there is the condenser, the compressor and all other electrical parts.

The unit is pre-tested, pre-charged and ready to go. This makes it very easy and fast for installation.

Drop In is available for medium temperature and also low temperature coldrooms.

The cooling capacity for medium temperature is from 1.2kW up to 3.1kW.

For the low temperature application the capacity is from 0.9kW up to 1.8kW.



# TECHNICAL DATA

## Medium Temperature

## Low Temperature

model	DROP-IN	DROP-IN	DROP-IN	DROP-IN	DROP-IN	DROP-IN	DROP-IN	DROP-IN	DROP-IN
	DI3NT	DI13NT	DI16NT	DI20NT	DI26NT	DI6LT	DI13LT	DI20LT	DI28LT
	NT	NT	NT	NT	NT	LT	LT	LT	LT
	R290	R290	R290	R290	R290	R290	R290	R290	R290
	220/50	220/50	220/50	220/50	220/50	220/50	220/50	220/50	220/50
Supply voltage	220V/1/50Hz					220V/1/50Hz			
Cooling capacity (W) [1]	1192	1543	2x 1022	2x 1192	2x 1543	907	2x 606	2x 694	2x 907
Absorbed power (W) [1]	513	736	2x 444	2x 513	2x 736	684	2x 411	2x 474	2x 684
Absorbed current (A) [1]	2,37	3,97	4,62	4,74	7,94	3,79	4,00	4,56	7,58
Maximum absorbed power (W)	1129	1403	1696	1922	2470	1547	1770	2036	2758
Panel width (mm)	800					800			
Panel height (mm)	400					400			
Ø Liquid diameter (mm)	6	6	6	6	6	6	6	6	6
Ø Suction diameter (mm)	8	10	8	8	10	10	8	8	10
Weight (Kg)	56	61	68	69	81	63	69	70	87
Plug	PLUG 2P+T 32A 6h IP66/IP67					PLUG 2P+T 32A 6h IP66/IP67			
Compressor	NEU6217U	NT6222U	2x NEU6214U	2x NEU6217U	2x NT6222U	NT2210U	2x NEU2168U	2x NEU2178U	2x NT2210U
Displacement (cm <sup>3</sup> )	14,28	20,44	2x 12,11	2x 14,28	2x 20,44	27,8	2x 16,80	2x 18,70	2x 27,80
Type	Ermetico Embraco					Ermetico Embraco			
Lubrificant	ESTER / ISO22					ESTER / ISO22			
Refrigerant	R290					R290			
Standard quantity (Kg)	0,15	0,15	2x 0,13	2x 0,15	2x 0,13	0,13	2x 0,11	2x 0,14	2x 0,12
Condensator	COIL D= 5 mm					COIL D= 5 mm			
Fin spacing (mm)	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5
Nr. of rows	2	2	4	4	4	2	4	4	4
Frontal area (m <sup>2</sup> )	0,144	0,144	0,144	0,144	0,144	0,144	0,144	0,144	0,144

[1] Te = -10°C (TN) / -35°C (BT)      Tc = +45°C



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