energy box

ORIGINAL PART

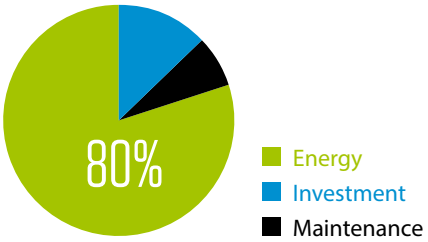
CAPTURING VALUABLE ENERGY

RECOVERING THE ENERGY

Simply put, the Energy Box reuses captured energy. The value of this immediately shows up in huge cost savings and reduced CO_2 emissions to the environment.

Air compressors are big consumers of energy. In fact, over the lifetime of a compressor, energy consumption typically represents 80% of its total cost of ownership. That's why recovering the compressor's energy means saving money.

Total cost of ownership



The way to achieve this is by harnessing the compression heat. Even the most efficient compressor transforms up to 94% of the electric energy into heat.

A large part of this heat is released into the atmosphere via the compressor's cooling system.

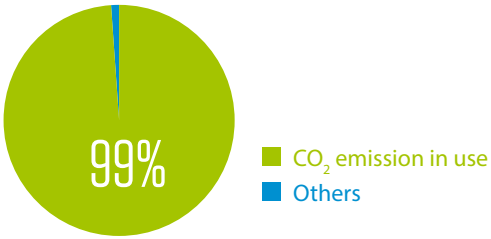
With the Energy Box, you can recover up to 80% of this valuable thermal energy.

WHAT SIZE IS YOUR FOOTPRINT?

Reducing your CO_2 emissions is not just beneficial for future generations, it may well have become a legal requirement or part of your company's certification policy.

99% of the CO_2 emissions of a compressor in use are directly related to its energy consumption, so this is another good reason to invest in an energy recovery system.

Typical CO_2 footprint of air compressors



THERMAL ENERGY PUT TO USE

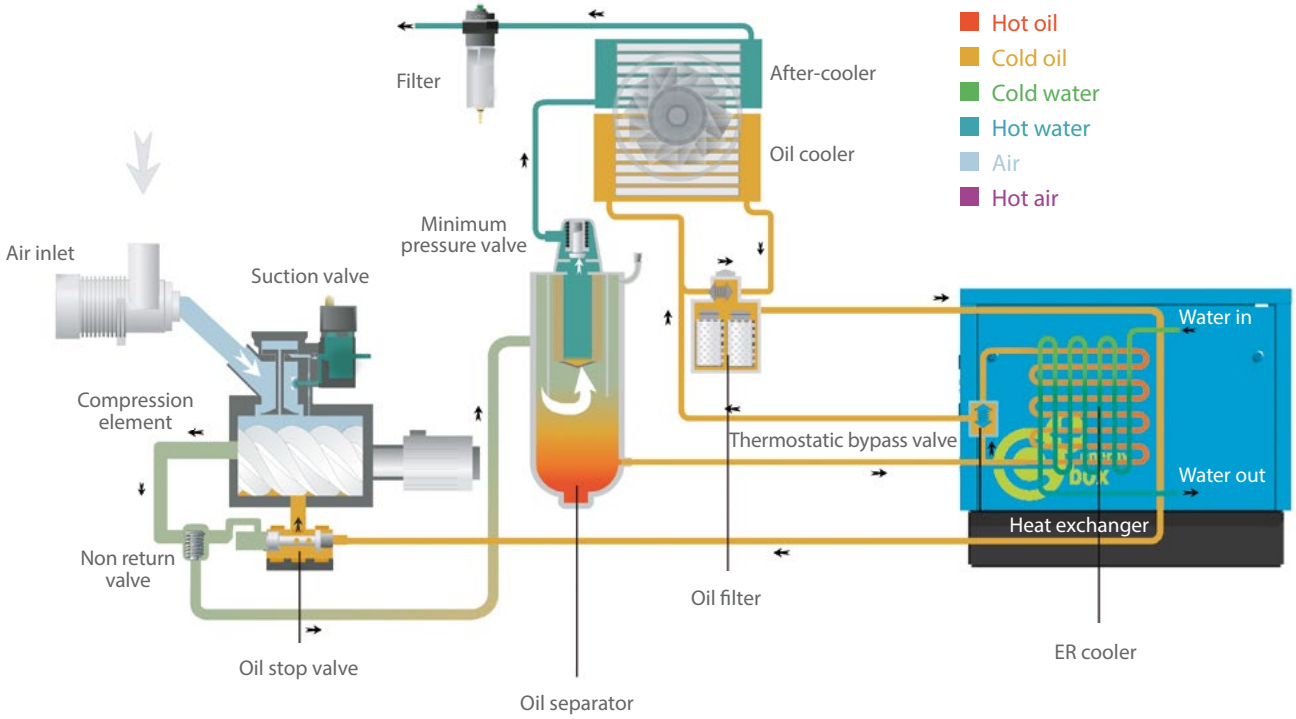
In addition to using compression heat for space heating and hot water for showers, many industrial processes require heat for drying, air curtains, pre-heating, sterilization, steam cracking, dyeing, purging and many other applications. Using the recovered heat from your compressor may reduce the investment cost for additional equipment, the extra CO_2 emissions and of course the overall energy cost. In a world of soaring energy prices, this may well have a big impact on your competitiveness.

As an extra benefit, removing compression heat reduces the compressor room temperature. Better ambient conditions will improve the equipment's efficiency and increase its lifetime!

HOW RECOVERY WORKS

The oil in an oil-injected rotary screw compressor absorbs the compression heat. Before being led to the oil cooler, the hot oil is diverted through a heat exchanger inside the Energy Box, where the heat is transferred to a water circuit.

The amount of thermal energy recovered and money saved depends on the compressor's size and use factor (numbers of operating hours per year). Recovery of up to 80% can be achieved, and in the case of hot water, up to 90%.



Application	Equivalent months/year	Duty	Saving*
Process water	12 months	8,000 h	€ 25,000
Process steam	12 months	8,000 h	€ 25,000
Space heating	4 months	3,000 h	€ 13,500
Showers	2 months	2,000 h	€ 7,000

** When using compressors above 60kW*

Saving calculation for Energy Box

Installed power
55 kW

Effective usable shaft power (95%)
54 kW

Potential recovery (70% of shaft)
38 kW

Calorific value of oil
47,700 kJ/kg

Boiler efficiency
90%

Specific gravity of fuel
0.84 kg/l

INTERMITTENT USE

8,000 H/YEAR

13,167 l

Fuel saved @ 3,000 h running

35,112 l

109,725 kWh

Energy recovered

292,600 kWh

€ 6,288

Saving per year*

€ 16,769

** Based on oil cost for heating @ 0.55 €/l*

IT'S ALL IN A BOX

The Energy Box is a compact, space-saving unit, installed between the compressor and your heating circuit. The modular design guarantees easy installation and perfect integration.

Energy Box features	Your benefits
Vertical heat exchanger	Reduced footprint – small space required
Twin cooler concept*	Reliability – reduced risk of oil pressure shutdown
Plugs and connection kits	Easy and fast to install
Extended hose kits	Allows up to 6 m between compressor and Energy Box
Environmentally friendly	Exceptional CO_2 reduction

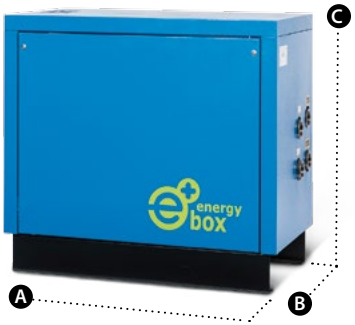
** When using compressors above 60kW*

> By having the energy recovery system installed in our compressor room we reduced the need for external fuel input and savings were perceived immediately. This is a great value versus benefits in our facility.

DIMENSIONS

Energy Box S1 – S3	
kW	11 – 90
A (mm)	477
B (mm)	450
C (mm)	807

Energy Box S4	
kW	110 – 180
A (mm)	877
B (mm)	500
C (mm)	807



TECHNICAL SPECIFICATIONS

	Rated power		Recoverable		Heated water volume		Savings per year		
	kW	hp	kW	hp	70°C (Δt 20°C) liter/year	70°C (Δt 50°C) liter/year	Fuel liter	Heating cost €	CO_2 Savings ton
S1	11	15	8.9	11.9	1,148,113	459,245	3,091	1,700.00	7,049
	15	20	12.1	16.2	1,560,917	624,367	4,203	2,311.00	9,583
	18.5	25	15.0	20.0	1,935,022	774,009	5,210	2,875.00	11,880
	22	30	17.8	23.8	2,296,226	918,490	6,182	3,400.00	14,098
	30	40	24.2	32.5	3,121,835	1,248,734	8,406	4,623.00	19,166
S2	37	50	29.9	40.1	3,857,143	1,542,857	10,385	5,712.00	23,681
	45	60	36.6	48.7	4,695,652	1,878,261	12,643	6,954.00	28,829
	55	75	44.4	59.6	5,727,664	2,291,065	15,421	8,482.00	35,165
S3	75	100	60.6	81.2	7,817,487	3,126,995	21,048	11,577.00	47,995
	90	125	72.7	97.5	9,378,404	3,751,362	25,251	13,888.00	57,578
S4	110	150	88.8	119.0	11,458,552	4,583,421	30,852	16,969.00	70,349
	132	180	106.6	142.9	13,750,263	5,500,105	37,022	20,362.00	84,419
	150	200	121.1	162.3	15,625,299	6,250,119	42,070	23,139.00	95,931
	160	220	129.2	173.2	16,666,985	6,666,794	44,875	24,681.00	102,326
	180	240	145.4	194.6	17,378,404	7,500,143	50,485	27,767.00	115,117

High water flow systems - Δt in/out = +10°C				
	kW	hp	Water flow (l/min)	Δp in/out (bar)
S1	11	15	11.8	0.008
	15	20	16.1	0.014
	18.5	25	19.3	0.019
	22	30	23.6	0.027
	30	40	32.2	0.048
S2	37	50	39.7	0.192
	45	60	48.3	0.278
	55	75	59.0	0.405
S3	75	100	80.4	0.259
	90	125	96.5	0.364
S4	110	150	117.9	0.355
	132	180	141.5	0.497
	160	200	171.5	0.708
	180	220	192.9	0.879

Low water flow systems - Δt in/out = +70°C				
	kW	hp	Water flow (l/min)	Δp in/out (bar)
S1	11	15	2.0	0.001
	15	20	2.7	0.001
	18.5	25	3.2	0.001
	22	30	3.9	0.001
	30	40	4.6	0.002
S2	37	50	5.6	0.005
	45	60	5.7	0.007
	55	75	8.3	0.010
S3	75	100	11.3	0.007
	90	125	13.6	0.010
S4	110	150	16.6	0.010
	132	180	20.0	0.014
	160	200	24.2	0.020
	180	220	27.2	0.024