

ICS CHILLERS

A world of experience...



TAEevo

Industrial Chillers and Heat Pumps
(TAEevo, TWEevo, HAEevo, TAEevo Laser)



industrialcooling

SYSTEMS TECHNOLOGY

ICS CHILLERS

A world of experience...



Industrialcooling

SYSTEMS TECHNOLOGY

Equipment Features

Suited to all conditions

Water inlet limits of -5 to 35°C and outlet limits of -10 (0°C on M03 -10) to 30°C ensure TAEevo is suited to all industrial applications. IP54 protection (from O31), full frontal access, easily removable panels and a separate refrigeration compartment (from O15) facilitate ease of use.

Maximum control

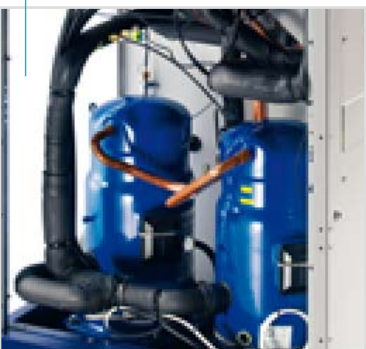
The large tank and evaporator ensure steady water temperatures, even during sudden load variations. This is further enhanced by passing the water through the evaporator before entering the tank, offering a ready chilled water supply. HP, LP and water manometers (from O31) give quick overview status.

Assured quality

All models are individually waterside tested at nominal operating conditions, and also undergo operating tests, refrigerant charge and leakage controls, and microprocessor and safety device setting verifications. Leading brand components are used throughout, ensuring long term reliability.

Fail-safe operation

TAEevo always operates in all conditions, thanks to an internal trace water by-pass, numerous safety devices, generous water temperature limits, a 46°C ambient temperature limit, antifreeze protection and an internal water level sensor. The advanced microprocessor ensures fail-safe operation at all times.



Easy frontal access



Large buffer tank



Extensively lab tested



Advanced microprocessor

Packaged air cooled water chillers, complete with hydronic kit (accumulation tank + pump), scroll type hermetic compressors (reciprocating as an option). Cooling capacities from 1.4 to 176kW.

THE OPTIMUM INDUSTRIAL CHILLER FROM ICS

Reduced costs and improved productivity – TAE ν offers precise water temperature control, with numerous benefits:

- Increased productivity and reduced production cycle times.
- Reduced production costs, as well as less wastage.
- Reduced maintenance times and fewer interruptions during production.

Closed circuit operation – TAE ν operates in a closed circuit, offering the following advantages:

- Extremely precise water temperature control, independent of ambient conditions.
- Quick reaction to any sudden load changes, ensuring steady operating conditions.
- The same water is continuously reutilised, thereby avoiding both unwanted wastage of this precious resource and the health hazards of water born bacteria.

A chiller designed for industry – Unlike typical chillers, TAE ν has been designed specifically for industry. Fruit of over 20 years in the industrial chilling market, with hundreds of thousands of refrigerating machines installed worldwide, TAE ν perfectly matches the needs of a diverse range of industries. This is thanks to:

- Generous operating limits, both as regards the water inlet and outlet temperature.
- A robust construction with high ambient temperature limits, allowing operation in all conditions worldwide.
- An extensive range of accessories which allows TAE ν to be personalised to all individual applications.
- A fully packaged and easy to use solution, with integrated pump and tank, perfectly suited to the needs of the industrial user.

Lowest operating costs – Thanks especially to energy efficient scroll compressors, the oversized evaporator and the unique evaporator-in-tank configuration, TAE ν achieves leading energy efficiency levels. This is mated to low maintenance needs, ensuring TAE ν is a highly economical long-term proposition.

TAE ν is the perfect solution, whatever your application

- **Plastics and rubber** (presses, injection moulding, extrusion (sheet and profile), blow moulding, thermoforming, PET)
- **Lasers – with specific laser chiller** (cutting, welding, profiling, optics, medical engraving)
- **Food and Drinks** (confectionary, bakeries, distilleries, breweries, wineries, dairies, bottling, carbonation, meat, fish, vegetable and salad processing, storage)
- **Chemical and Pharmaceutical** (jacketed vessels, polyurethane foam mixers, natural gas, industrial cleaning, laboratories, healthcare, solvents, paints)
- **Metal working** (processing and transformation of precious metals, aluminium working and processing)
- **Mechanical and Engineering** (machine tools, welding machines, rolling mills, presses, extruders, cutting profiling, polishing, electric spark machinery, hydraulic control unit cooling, pneumatic transport, heat treatment)
- **Paper and related applications** (printers, cardboard, labels, plastic film)
- **Other applications** (ceramics, textiles, wood, rental, air compressor cooling, other applications)



Plastics industry



Laser industry



Chemical industry



Winery

ICS CHILLERS

A world of experience...

PERSONALISE TAE_{evo} TO YOUR INDIVIDUAL NEEDS

As industrial applications differ, so TAE_{evo} can be adapted to each individual need thanks to numerous configurations and accessories:

Pump options - 3bar pumps are supplied as standard, 5bar pumps or no pump on request (from 015). Twin pumps are also offered (from 201).

Water Circuit - A non-ferrous option (stainless steel water tank, copper/brass exchanger, stainless steel pump if not already standard) is offered on models 015-351. Alternatively models 015-351 can be supplied with a prismatic stainless steel tank and an external stainless steel plate heat exchanger (designed for open circuit operation); this configuration is also available with an evaporator flow switch which protects against water flow stoppages.

Condenser Section - Electronic fan speed control is offered from model 031. Centrifugal fans (from 031) are ideal for ducted or indoor installation. Pre-treated, blygold-type treated and copper-copper condenser coils (all from 015) cater for harsh ambients.

Low ambient temperature operation - The -20°C ambient version (from 031) offers electrical panel heating, electronic fan speed control and a crankcase heater. Antifreeze heating and pump trace heating are also available (from 015).

Special Voltages - 60Hz versions with or without UL approval are available.

Close control Version - The Laser version offers extremely precise temperature regulation ($\pm 0.5^\circ\text{C}$) thanks to the application of hot gas by-pass control.

HAE_{evo} options - Transport wheels and handles (031-161) and stainless steel panels (031-351) are available.

Other accessories - Differing refrigerants (R134a, R22) can be supplied on request, as can NPT water connection adapters (standard on 60Hz/UL units). Crankcase heaters and a glycol fill kit (all from 015) are also offered.



Internal pump



Centrifugal fans



Stainless steel plate exchanger

Equipment Features

Atmospheric pressure fill kit

This kit (from 015) is simply installed onto the back of the chiller itself, and features a generous tank (with an easy to read water level indication) encased within a tough galvanised steel cabinet. A tap offers easy chiller water tank filling. The fill kit is standard on models M03-10.

Pressurised fill kit

This kit, available from model 015, is used in pressurised water circuit applications (up to 6bar). The kit features all components required for safe and easy operation, including a pressure reducer, water inlet valve, pressure gauge, automatic relief valve, safety valve and expansion tank.

Remote control options

The following remote control options are offered from model 015:

- Simple remote control module (on/off, unit status) for installation at up to 150m from unit;
- Advanced remote control module (full control), for installation at up to 150m from unit.

Supervisor options

The microprocessor can be linked to various external Supervisor systems:

- RS485 serial connection to an external supervisor (MODBUS and other leading systems);
- XWEB300 Supervisor kit, operating via internet;
- Remote GSM connection directly to a mobile phone.



Atmospheric pressure fill kit



Pressurised fill kit



Remote Control



XWEB300 Supervisor

Packaged air cooled water chillers, complete with hydronic kit (accumulation tank + pump), scroll type hermetic compressors (Reciprocating as an option). Cooling capacities from 1.4 to 176kW.

Evaporator-in-tank configuration

The innovative evaporator-in-tank configuration (co-axial copper coil with stainless steel tank on M03-10, finned aluminium/copper coil with carbon steel tank from 015), allows operation even with impure liquids. Unit dimensions are reduced, and a steady water temperature is ensured as the evaporator also cools the tank itself. Ambient heat gain is reduced, increasing efficiency.

Choose between atmospheric pressure or (from 015) pressurised (max 6barg) operation, with matching fill kits. Bleed and drain valves and a water level sensor are fitted (from 015); the water by-pass and antifreeze warning ensure fail-safe operation.

Pumps

A 3bar pump, standard on all models, is mounted within the chiller itself. Various other pump options are available. Centrifugal pumps are fitted (from 015), models 015-251 feature a stainless steel water-side.

Compressors

Piston (M03 and 015-051), rotary (M05-10) or scroll (from 081) compressors are utilised. Scroll compressors offer reduced energy consumptions, low vibrations, less moving parts and high resistance to liquid refrigerant returns.



Whatever your need, ICS offers the solution

TAE_{evo} (M03-602)

The most popular solution, with an air-cooled condenser allowing quick and easy installation and high versatility in a multitude of applications. As per the rest of the range, the internal tank and pump offer a fully packaged solution.

TWE_{evo} (015-602)

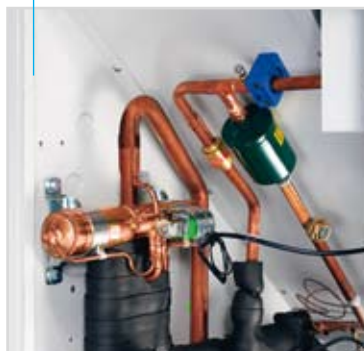
Water-cooled models offer elevated energy efficiency (EER) levels, and are well suited to hot ambients, or those where indoor installation is required. Noise levels are also reduced notably.

HAE_{evo} (031-351)

Heat pumps produce chiller and hot water, offering extreme versatility. A 4-way valve allows easy cycle inversion. MTA's unique Frost Detection System offers intelligent defrosting with efficiency gains.

TAE_{evo} Laser (051-351)

This laser chiller, supplied to renowned OEM accounts, features a non ferrous water circuit and close control temperature regulation via a hot gas by-pass. A 6bar pump and tank electrical heater are standard.



Robust fan section

Shell & tube condenser

4-way valve

Laser chiller

Advanced microprocessor

The microprocessor (from M05) offers icon messages and a digital water outlet temperature reading. Up to 10 alarms are offered, plus extensive programming to individual needs. An alarm history, volt free general alarm contact and protective plastic cover are standard from model O15.

Condensing section

Air-cooled condensers (copper tubes/aluminium fins) are fitted on one side only, reducing space needs. A pre-filter is standard (from O31).

Water-cooled models feature a plate (O15-O20), co-axial (O31-161) or shell & tube (201-602) configuration.

HAEEvo's condenser maximises efficiency in the heat pump mode, when it inverts to an evaporator function.

Multiple components

Units with 2 compressors (from 201) or 4 compressors within 2 circuits (from 402) feature compressor rotation and a compressor unloading function which improves operation in harsh conditions. Models from 402 feature multi-step fan speed control.

Large Chillers

MTA offers industrial air and water-cooled chillers up to 1500kW with multiscroll, piston, screw or centrifugal compressors. Freecooling units, ideal for industrial applications, are also available.

Hydraulic circuit design

In many cases the chiller forms part of a complex hydraulic network. ICS offers expert consultancy born from extensive field experience in countless applications, allowing users to obtain the most from their chilled water network.



Phoenix plus chiller



Process cooling application

		M03	M05	M10	
TAEevo	Cooling capacity (1)	kW	1.4	2.5	4.4
	Absorbed power (1)	kW	0.5	0.73	1.32
	Cooling capacity (2)	kW	0.9	1.8	3.2
	Absorbed power (2)	kW	0.52	0.77	1.36
TWEevo	Cooling capacity (3)	kW	-	-	-
	Absorbed power (3)	kW	-	-	-
	Cooling capacity (4)	kW	-	-	-
	Absorbed power (4)	kW	-	-	-
HAEevo	Cooling capacity (1)	kW	-	-	-
	Absorbed power (1)	kW	-	-	-
	Cooling capacity (2)	kW	-	-	-
	Absorbed power (2)	kW	-	-	-
	Heating capacity (5)	kW	-	-	-
Absorbed power (5)	kW	-	-	-	

General Data

Refrigerant	-	R134a	R407C	
Power Supply	V/Ph/Hz	230 ±10%/1/50		
Protection Class	-	IP20	IP33	
Total installed power (6)	kW	1.03	1.64	2.06
Compressors/Circuits	N°	1/1	1/1	1/1

Air-cooled models

Axial Fans	N° Fans	N°	1	1	1
	Nominal power (each)	kW	0.065	0.146	0.146
	Total air-flow	m ³ /h	900	2200	2100
	Noise level (7)	dB(A)	48.2	48.3	48.3
Centrif. Fans	N° Fans	N°	-	-	-
	Nominal power (each)	kW	-	-	-
	Available head pressure	kPa	-	-	-
	Total air-flow	m ³ /h	-	-	-
Noise level (7)	dB(A)	-	-	-	

Water-cooled models

Water flow	m ³ /h	-	-	-
Condenser water connections	ln	-	-	-

Pump section

P3	Water flow (nom.with ΔT 5 °C MAX)	m ³ /h	0.24/0.34	0.43/1.2	0.76/1.2
	Available head pressure (nom./min.)	bar	1.18/0.54	2.78/0.46	2.78/0.46
	Nominal power	kW	0.25	0.33	0.33
P2	Water flow (nom.with ΔT 5 °C MAX)	m ³ /h	-	-	-
	Available head pressure (nom./min.)	bar	-	-	-
	Nominal power	kW	-	-	-

Dimensions (8)

Width	mm	325	575	575
Depth	mm	728	652	652
Height	mm	540	805	805
Operating weight (with P3 pump)	kg	63	106	113
Tank volume	l	8	25	25
Evaporator water connections	ln	1/4"	1/2"	1/2"

- Evaporator water inlet/outlet temperature 20/15 °C, external air temperature 25 °C
- Evaporator water inlet/outlet temperature 12/7 °C, external air temperature 32 °C
- Evaporator water inlet/outlet temperature 20/15 °C, external air temperature 40/45 °C
- Evaporator water inlet/outlet temperature 12/7 °C, external air temperature 40/45 °C
- Evaporator water inlet/outlet temperature 40/45 °C, external air temperature 10 °C
- Unit with P3 pump and ON/OFF fan speed control (if fitted)
- Sound pressure level in free field at 10mm from nit condenser side and 1.6m from ground
- For unit with standard power supply, axial fans, ON/OFF fan speed control. Air-cooled models operate at temperatures of up to 46 °C (with 12/7 °C water temperature)

The capacity correction factors in the following table should be used as a guide only. For accurate selection at conditions differing from the above, the selection software should be utilised

Water outlet temperature ≠ 7 °C		°C	-10	-5	0	5	7	11	15
Correction factor	K1		0.36	0.44	0.56	0.74	0.79	0.89	1
Correction factor (M series)	K1		-	-	0.57	0.73	0.79	0.89	1

Evaporator ΔT ≠ 5 °C		°C	4	5	6	7	8	9	10
Correction factor	K2		0.994	1	1.005	1.010	1.017	1.021	1.025

External air temperature ≠ 25 °C		°C	20	25	30	32	35	40
Correction factor	K3		1	1	0.95	0.92	0.89	0.83
Correction factor (M series)	K3		1.04	1	0.95	0.92	0.87	0.83

Ethylene glycol solutions		%	0	10	20	30	40	50
Correction factor	K4		1	0.99	0.98	0.97	0.96	0.93

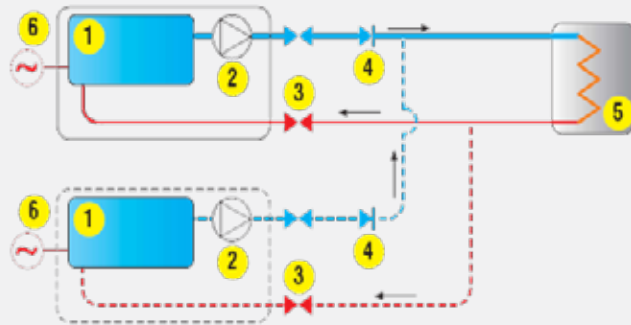
Condenser ΔT ≠ 5 °C (TWEevo)		°C	5	10	15
Correction factor	K5		1.050	1	0.95

ICS Chiller Range

015	020	031	051	081	101	121	161	201	251	301	351	402	502	602
7.3	9.5	13.8	20.4	28.4	41.9	52.2	59.2	67.4	80.8	88.3	100.1	126.2	146.5	175.3
1.9	2.1	3.6	5.0	6.3	8.5	10.3	13.0	15.3	17.3	19.4	22.7	27.0	30.3	36.0
5.0	6.6	9.9	14.4	21.0	30.8	38.5	43.6	49.8	59.2	65.7	73.5	92.6	106.6	129.3
1.7	2.0	3.4	4.9	6.7	9.0	10.8	13.5	16.1	18.2	20.4	23.9	28.9	32.5	38.2
7.0	8.5	13.0	21.2	28.7	38.6	50.6	57.8	64.9	75.5	85.8	98.6	125.5	143.2	169.8
1.7	2.1	3.3	5.2	5.9	7.5	10.1	11.5	14.3	17.0	20.2	24.8	28.7	33.7	40.2
5.1	6.2	10.6	15.6	21.9	30.9	39.8	44.5	52.1	60.8	67.0	75.9	96.6	112.0	133.3
1.5	1.9	3.1	4.5	5.8	7.5	10.0	11.4	13.8	16.4	19.4	24.5	28.1	32.6	38.9
-	-	13.4	19.7	27.7	40.0	50.2	56.5	65.0	78.3	85.4	97.0	-	-	-
-	-	3.7	5.6	6.3	8.5	10.2	12.8	15.2	17.2	19.4	22.7	-	-	-
-	-	9.7	14.2	20.3	29.2	36.9	42.1	48.5	57.2	63.8	71.7	-	-	-
-	-	3.4	4.9	6.7	9.0	10.8	13.5	16.0	18.2	20.4	23.9	-	-	-
-	-	12.0	17.0	25.1	33.0	41.5	47.1	54.0	65.1	76.1	86.7	-	-	-
-	-	3.4	4.6	6.7	8.6	11.2	12.8	14.8	17.2	19.7	24.2	-	-	-
R407C														
400±10%/3/50														
IP44							IP54							
3.19	3.83	5.96	7.85	10.78	14.46	18.37	21.17	23.62	27.00	31.16	37.27	48.35	55.11	61.02
1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	2/1	2/1	2/1	2/1	4/2	4/2	4/2
1	1	1	1	1	2	2	2	2	2	3	3	2	2	2
0.27	0.27	0.54	0.54	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	2.0	2.0	2.0
3500	3100	6600	6200	8500	15100	13500	13500	16900	16300	22350	22350	45600	44000	42500
52.4	52.4	53.1	53.1	53.6	54.1	54.1	55.0	56.3	56.3	58.0	58.0	64.0	64.0	64.0
-	-	1	1	2	2	2	2	3	3	3	3	2	2	2
-	-	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	4.8	4.8	4.8
-	-	166	185	260	140	125	138	237	245	150	150	450	440	420
-	-	6900	6400	9200	13600	13500	12780	18200	17600	20145	20145	40000	40000	40000
-	-	58.8	58.8	61.2	61.2	61.2	61.2	63.1	63.1	63.1	63.1	65.0	65.0	65.0
0.25/1.2	0.3/1.6	1.0/5.0	1.0/5.0	1.3/6.0	1.6/8.0	1.9/10.0	2.5/15.0	3.3/14.0	3.3/14.0	4.0/16.6	4.0/16.6	3.3/14.0	3.3/14.0	4.0/16.6
3/4"	3/4"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"
1.3/4.8	1.6/4.8	2.4/6	3.5/6	4.9/9.6	7.2/9.6	9.0/18	10.2/18	11.6/18	13.9/18	15.2/27	17.2/27	21.7/48	25.2/48	30.1/48
2.9/1.4	2.8/1.4	2.8/1.5	2.6/1.4	2.5/1.3	2.1/1.5	2.6/1.6	2.5/1.7	2.5/2.0	2.4/2.0	2.6/0.9	2.4/0.8	3.4/1.5	3.2/1.5	2.9/1.5
0.55	0.55	0.75	0.75	0.9	0.9	1.85	1.85	1.85	1.85	2.2	2.2	4	4	4
1.3/4.8	1.6/4.8	2.4/4.8	3.5/4.8	4.9/13	7.2/13	9.0/13	10.2/13	11.6/30	13.9/30	15.2/30	17.2/30	21.7/48	25.2/48	30.1/48
5.2/2.9	5.1/2.9	4.9/3.1	4.2/3.2	4.9/2.8	4.6/3.1	4.2/3.1	4.0/3.2	4.6/1.8	4.4/1.8	4.3/1.9	4.0/1.8	5.1/3.0	4.9/3.0	4.6/3.0
1.1	1.1	1.1	1.1	2.2	2.2	2.2	2.2	4	4	4	4	7.5	7.5	7.5
560	560	660	660	760	760	760	760	866	866	866	866	1255	1255	1255
1266	1266	1310	1310	1860	1860	1860	1860	2240	2240	2240	2240	3294	3294	3294
810	810	1400	1400	1447	1447	1447	1447	2064	2064	2064	2064	2140	2140	2140
188	193	316	336	474	644	663	674	916	1008	1118	1134	1812	1847	1911
60	60	115	115	140	255	255	255	350	350	350	350	500	500	500
3/4"	3/4"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"

Typical closed circuit configuration

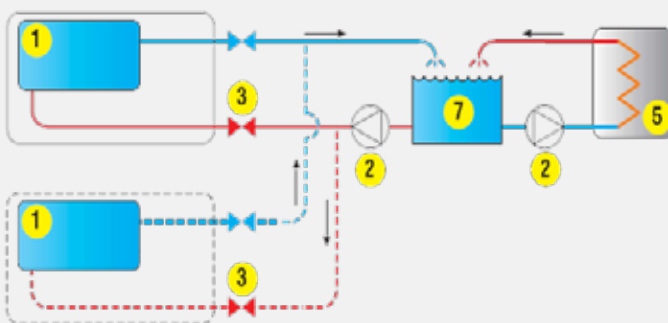
Pressurised closed circuits always require an expansion tank; this can either be manual or automatic, but if two or more chillers are installed in parallel the automatic configuration is required.



- 1 Accumulation tank
- 2 Pump
- 3 Valve
- 4 Non return valve
- 5 User
- 6 Expansion tank

Typical open circuit configuration

In atmospheric pressure open circuits the water is in contact with the ambient air, and as such an expansion tank is not required. In these applications an external pump is normally used, consequently the chiller should be fitted without a pump.



- 1 Accumulation tank
- 2 Pump
- 3 Valve
- 4 Non return valve
- 5 User

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The ICS Group of Companies



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