



Manual

SOLKAV ALU – STAR

scope of delivery – technical data
installation – reparation – stocking





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1. Scope of delivery

Aluminium-field

- element-breadth 1m (20 pipes, a DA 22mm)
- standart-lenght 5m (optional individual)
- O-ring seals (assembled)
- couplers to connect the header
- end caps fort he header-pipes (6 p./ box)
- checker plate fort he header (walk able)

Connection to the chiller

- 2 couplers and 2 end caps

Underground construction

- White plastic foil (+10% of the ice-surface) and cold-glue (just for one use) to connect the foil
- Aluminium corner profile 70x40x2 mm ; 6 m lenght
- Aluminium quadrat-bowl of 1m lenght for the header connection to get close the place

reparation - installationset (case)

2. Technical data

2.1. Dimensions



Aluminium pipes	20 p. of 1m breadth, a DA 22mm Insulation thicknes 1,0mm
max. field- lenght	100 meter
header Ø	DA 110; DN 100
stackboxes, of 30m lenght	length: 5,80 m breadth: 1,20 height: 1,20

2.2. Technical data

connection of the alu-field	alu crossbar-connection with O-ring seals
connection-system	Victaulic-couplers aluminum
between the header pipes	And seals;
Tichelmann pipes	3-pipe-system
Tichelmann piece	aluminium
chiller connection	Sterz-coupler (Camlock-coupler)
pressure checked	of 5 bar
reparation set	Aluminum glue
White underground foil	unit component
tolerance (level)	+/- 1cm of 5m
checker plate for the header	walk able (2mm thick)

2.3. Connection to the refrigeration-engineering

The connection-coupler to the refrigeration-engineering is a Victaulic-coupler.

2.4. Hydraulic design data

Pressure lost in the ice-field/m on each length



Ice-field length (m)	Äthylenglycol				Polypropylenglycol			
	20	30	40	60	20	30	40	60
Pressure lost bar/m	0,005	0,008	0,011	0,016	0,007	0,011	0,014	0,021
Pressure lost bar/length	0,1	0,24	0,44	0,96	0,14	0,33	0,56	1,26

e.g.: ice-field (20x30) = 0,008bar x 30m = 0,24bar on 30m length

Pressure lost in the system incl. fittings and exhauster

Ice surface (m ²)	DN header	Äthylenglycol	Polypropylenglycol
		Pressure loss	Pressure loss
200 (20Lx10B)	100	1,13 bar	1,20 bar
450 (30Lx15B)	100	1,75 bar	2,01 bar
600 (30Lx20B)	100	2,28 bar	2,70 bar
800 (40Lx20B)	100	2,16 bar	2,55 bar
1200 (40Lx30B)	100	3,21 bar	3,91 bar
1800 (60Lx30B)	100	6,03 bar	7,57 bar

B = breadth = box side

2.5. Refrigeration-engineering design data

Heat-transmission resistance λ

Aluminium – thickness 1mm

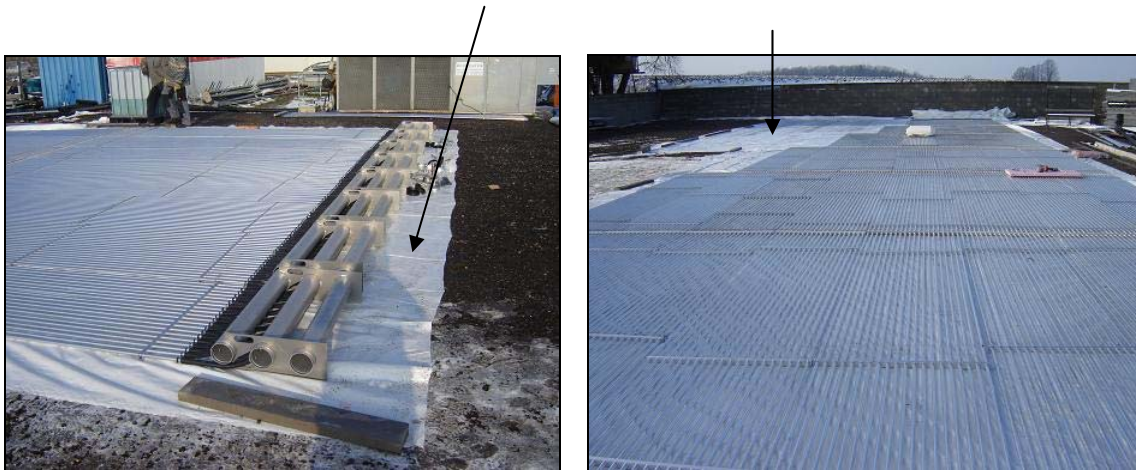
Heat-transmission resistance λ : 0,000004 m²K/W

Temperature complexity to overcoming of λ : -0,001°

3. Installation-manual

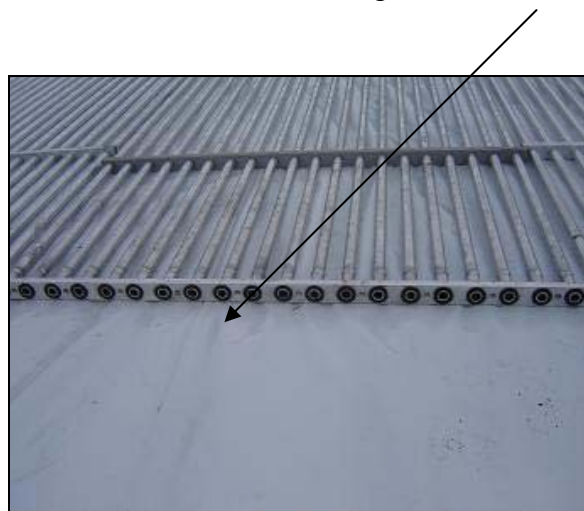
3.1. Underground - construction

Before the ice-field can be install, the place has to be very plane (tolerance +/- 1cm auf 5m), to get a constant ice-thickness. It will be covered with the white plastic foil, which will be glued with the cold-glue which is included.



3.2. Ice-field - construction

The aluminium fields will be delivered with O-ring seals.



The installation begins with:



The header element (boxes 1m) will be covered on the breadth side.



Then the middle-elements covers the ice-field length.



After that, the end-elements will be covered the place.

3.3. Ice-field - connection

Afterwards the ice-fields will be connected with 4 crews (or more) with the electrical screw driver which is included.

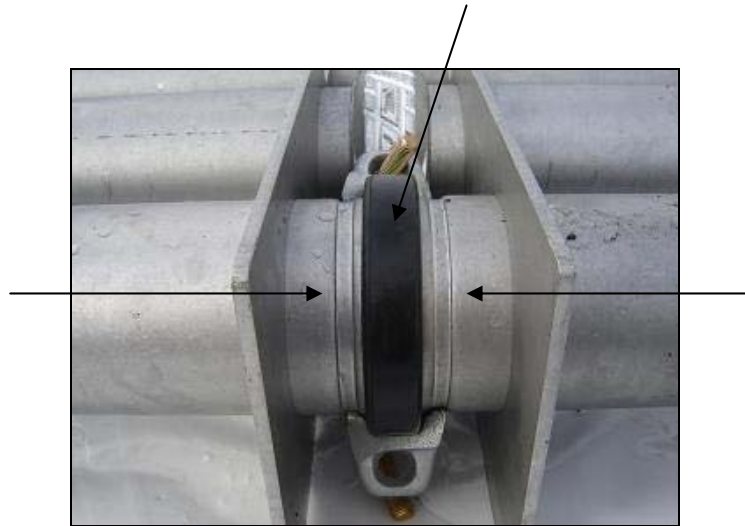


3.4. Header - connection

At the same time or afterwards the seals (for the Victaulic-coupler) will be installed at the connection-pieces of the header. First they will be fixed on one side of the pipes.



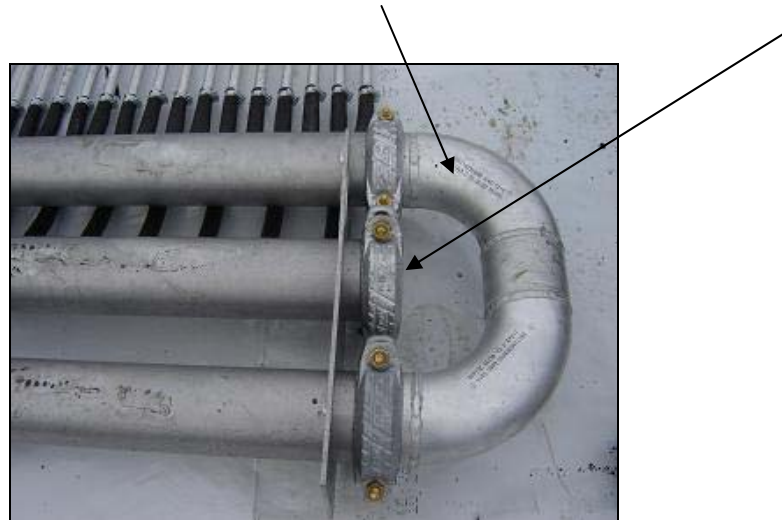
Then the pipes will be push together and the seals will be slide to the middle. This should be exactly to avoid a leakage.



Afterwards the coupler will take the right position (flute left and right) and will be screwed with 2 screws.



After the connection of all header, on one of the outside element, it will be installed the “Tichelmann”-piece and the end-caps as following the same principle as for the couplers.



3.5. Chiller – connection

The connection possibility to the refrigeration-engineering is a Victaulic-coupler on which will be fixed the pipes to the chiller.

Example:

The connection between the header and the chiller will be made with a flexible pipe or with an inflexible pipe. The pipes are equipped with Storz-couplers.



- Connection on the header side:

An aluminium pipe will be connected on the header with a Victaulic-coupler, on which will be fixed the flexible pipe with a Camlock-coupler.

- Connection on the chiller side:

On the chiller will be installed a flange-connection with a Victaulic-coupler. On that will be flanged a Storz-coupler for the connection to the pipes.



Flange-connection with Storz-coupler



Flange-connection with Victaulic-coupler
(on the chiller)

3.6. Aluminium bowl – construction

At the end aluminium – corner profiles will be placed around the ice-field. These will be added under the plastic foil (overlapped) so that it comes to a bowl. Also by the header input – and output will be installed a aluminium-bowl to get the whole place tight.





3.7. Glycol-fill – ventilation

The whole circle will be filled with a Glycol-water mixture (min. 30% Glycol; -18°C). With an external pump the mixture will be pumped from the Glycol-tank in the whole system to 1,5 bar pressure.

During the fill in, it will be hopefully to fix a tube on an output-valve and guide these back into the Glycol-tank. Due to these open system, the circle will be ventilated.

Ventilated must be:

- the pump
- the evaporator
- the pipe-system

After the ventilation, Glycol must be refill.

On following points have to be proved if the system is tight or not:

- On the rubber-pipes on the begin and the end
- On the O-ring seals by the ice-field elements
- On the welded connection by the aluminium pipes
- On the header connections

If the system is not thick on one point, please check the screws or use the reparation-set (see under reparation)

It should be installed a manometer on the return side to control the pressure (return side >0,5 bar)

In non-operative the system should have 1,5 bar pressure.

3.8. Checker plate

The checker plate (2,5mm thick) will be covered on the header, so everybody can walk on them.





4. Commissioning - Chiller

By starting:

- starting the power supply to the chiller approx. **12 hours** before commissioning (compressor pre-Heating)
- switch **ON** the controller (Chiller starts and runs by shelf)

Recommended adjustment:

- Cold adjustment -10°C output temperature - forward
- Antifreeze security -14°C
- System disconnection -16°C
- Glycol mixture -18°C freeze security (min. 30% Glycol)
- ΔT (forward – return) 3°C
- Ice thickness 5cm (min. 4cm/ max. 8 cm)
- Pressure in the system return >0,5 bar
 forward 1,5 – 2,5 bar

Producing ice:

- If return temperature > -5°C
- Infuse water
- Or fill in the bowl with water (control if the bowl is tight)

5. Reparation-manual

The including reparation – installation-set (case) consists of:

- reserve seals
- reserve tube
- aluminium glue
- aluminium reparation adhesive tape
- aluminium pipe cutter
- screws (high-grade steel)
- electrical screw driver
- hose fitting

By leakage:

- switch off the pump and the chiller

If it's untight by:

- rubber tubes → fix a second clip



- Ice-field connection → change the O-ring seals



- Welded connection → use the aluminium-glue compound





Furthermore:

- fill in Glycol

- ventilation of the system
 - the pump
 - the evaporator
 - the pipe system

after that, fill in Glycol once more

Advice: The ice-thickness is keeping a few ours before it begin to melt.

6. Disassembling - stocking

- First the Glycol mixture must be pump out of the system
- After that the ice-field can be disassembled
- On the disassembled header must be installed end caps
- Also on the chiller must be installed end caps on in- and output

The ice-field elements can be stack on top of each other on pallets. It must not stack 3 pallets over each other.

The stock has to be roofed and the pallets must not stand in the directly shaft of sunlight. Avoid the contact to materials which aid corrosion like, salt, chlorine und metal. Handling with other metals excepting aluminium is not allowed. Heavy things must not stand on the pallets.





7. Contact data

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