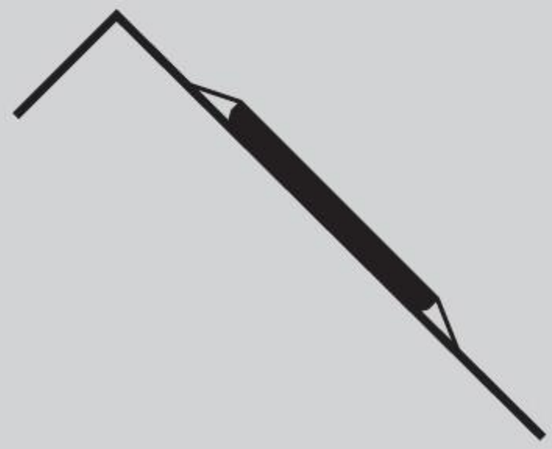
Your Reliable Source for Solar Systems.

MANUAL

Inroof-mounting system

Inroof-collector
IDMK25 / IDMK12



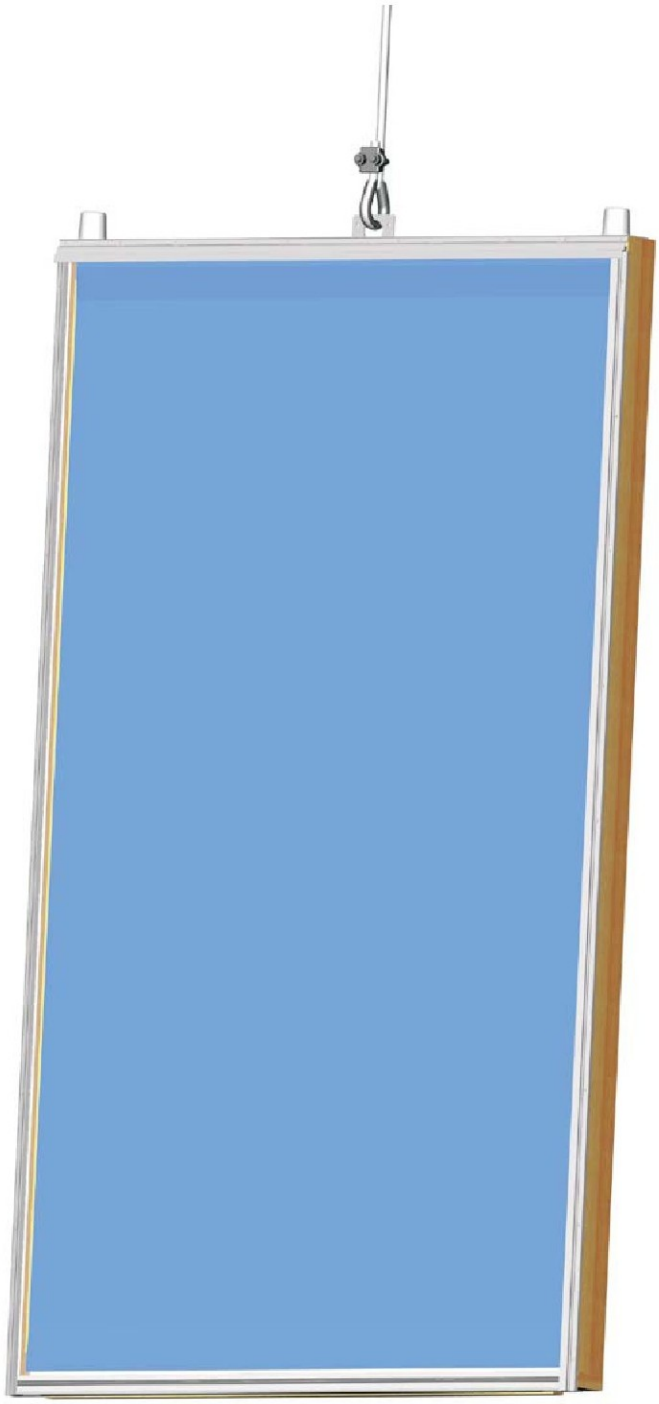
Contents

Safety information

	Safety precautions: Before commencing mounting work on roofs, it must be ensured in all cases that the non-personal fall protection and fall-arrest systems required by DIN 18338 (Roof Covering and Roof Sealing Works) and DIN 18451 (Scaffolding Works) are in place. See also Builders' Protection Ordinance [Bauarbeiterschutzverordnung], Federal Law Gazette 340/1994, paragraphs 7-10! Other country-specific regulations must be observed!		Safety harnesses should be fixed above the users whenever possible. Safety harnesses should only be fastened to sufficiently load-bearing structures or fixing points!
	If non-personal fall protection or fall-arrest systems cannot be installed for technical reasons, all personnel must be secured by means of suitable safety harnesses!		Never use damaged ladders (e.g., wooden ladders with split runners or rungs, or bent or buckled metal ladders). Never try to repair broken runners, rungs or steps on wooden ladders!
	Only use safety harnesses (safety belts, lanyards and straps, shock absorbers, fall arresters) that were tested and certified by authorized testing bodies.		Ensure that ladders are put up safely. Observe the correct leaning angle (68° - 75°). Prevent ladders from sliding, falling over or sinking into the ground (e.g. using wider feet, feet suited to the ground or hooking devices).
	If non-personal fall protection or fall-arrest systems are not provided, working without the use of suitable safety harnesses may lead to falls from heights and therefore cause serious or lethal injuries!		Only lean ladders against secure points. Secure ladders in traffic areas by suitable cordoning.
	Ladders not properly secured against sinking in, sliding or falling over may lead to dangerous falls!		Contact with live electric overhead cables can be lethal.
	Whenever you are near live overhead electric cables where contact is possible, only work if: - it is ensured that they are voltage-free and this is secured for the duration of work. - the live parts are secured by covering them or cordoning them off. - the prescribed safety distances are maintained. Voltage radius: 1m with .....voltages up to 1000V 3m with .....voltages from 1000V to 11000V 4m with .....voltages from 11000V to 22000V 5m with .....voltages from 22000V to 38000V > 5m in case of unknown voltages		Wear protective goggles when drilling and handling evacuated tube collectors (danger of implosion)!
			Wear safety shoes when carrying out installation work!
			Wear cut-proof safety gloves when mounting collectors and handling evacuated tube collectors (danger of implosion)!
	The manufacturer hereby guarantees to take back products identified with an eco-label and to recycle the materials used. Only the heat transfer medium specified may be used!		Wear a helmet when carrying out installation work!

ATTENTION:

Do not lift collectors by the connections or the screw threads!



Assembly instructions

Instructions for installation and transport

The installation may only be carried out by qualified personnel. Please inform yourself about the applicable local norms and regulations before mounting and operating the solar system. Only the supplied material should be used for the installation. Note: Installing a collector array signifies an intervention into an existing roof. Roof coverings, e.g. tiles, shingle and slate, especially in the case of converted and inhabited loft spaces or roofs with less than the minimum slope (with regards to the covering) require additional on-site measures, e.g. sarking, as security against water penetration caused by wind pressure and driving snow. The use of a carrying strap is recommended for transporting the collector. The collector must not be lifted at the connections. Avoid impacts and mechanical action on the collector, especially on the solar glass and the pipe connections.

Structure

The collectors may only be mounted on sufficiently load-bearing roof surfaces and substructures. The structural load-bearing capacity of the roof and the substructure must be tested at the installation site before mounting the collectors. Here, particular attention should be paid to the quality of the timber substructure in terms of the stability of the screw joints necessary for installing the collectors. In particular, it is essential to have the entire collector structure verified at the installation site according to DIN 1055, Part 4 & 5 or according to country-specific regulations in regions with heavy snowfalls (Note: 1m³ powder snow ~ 60kg/1m³ wet snow ~ 200kg) and strong winds. The assessment should also take into account any special features of the particular site that could lead to increased loads (foehn wind, air jets or eddy formations, etc). Collector arrays should always be installed in such a way that any possible snow piles caused by snow trap grids (or the position of the collectors) do not reach the collectors. There must be at least 1m distance from roof ridging or edges.

Lightning protection / Equipotential bonding of the building

It is not necessary to connect collector arrays to the lightning protection of the building (please observe the country-specific regulations). For installations on metal substructures at the installation site, authorized lightning protection specialists must be consulted. The metal tubes of the solar circuit must be connected to the main potential equalization bus by means of a conductor (green/yellow) with a cross-section of at least 16mm² CU (H07 V-U or R). It is possible to ground the collectors to a ground rod. The grounding line must be laid outside the house. The ground rod must also be connected to the main potential equalization bus by a line with the same cross-section as above.

Connections

Depending on the design, the collectors must be connected with one another and/or the connection pipes using screw fittings (1" internal thread) with flat-face sealing. Ensure correct placement of the flat gaskets. If flexible pipes are not used as connectors, precautions must be taken to protect the connection pipes against temperature fluctuations caused by heat expansion (expansion bends/flexible piping). In this case, no more than 6 collectors (IDMK25) may be connected in series. Larger collector arrays must be assembled with expansion bends or flexible members inserted in the links (IMPORTANT: check the pump design). When tightening the connections, always apply counter-pressure with a wrench or another spanner to prevent damage to the absorber.

Collector inclination / General notes

The collector is suitable for angles between 20° (minimum) and 65° (maximum).
The collector should be installed in such a way that rear ventilation is guaranteed - to prevent moisture diffusion in the collector!
Steps must be taken to ensure that water and other contaminants such as dust, etc. are prevented from getting into the collector connections and ventilation holes.

Cleaning

Clean the water drip of the metal frame at least once a year (or more often if necessary) to remove soiling (leaves etc.).

Collector warranty

Warranty claims can only be made if the supplier's own antifreeze is used and maintenance is carried out correctly.

Note

Assembly steps 9-11, 18 and 23-26 apply only to double-row mounting!

Measuring tape

Drill

Cross bit (Pz-2), Torx bit (TX-15)

Hex spanner

Water pump pliers

Angle grinder

Hammer

Installation wrench

Overview of materials

Installation batten 30x40x2450

Attachment bracket

Self-trapping screws 5*60 / 5*40

Connecting bend

Flat gasket

Front corner section right/left or middle

Side piece right/left

Side tin cover strip

Sealed plumping screw 4,5*35

Middle cover strip

Sealed plumping screw 3,9*13

Wooden wedge

Self-trapping screws 6*120

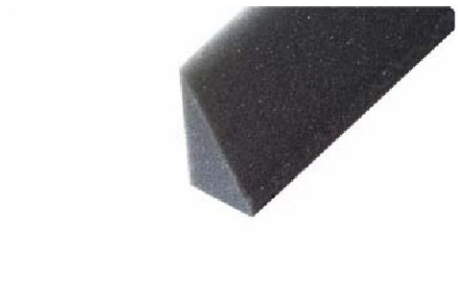
Side piece connector right/left

Middle cover right/left or middle

Rear corner section right/left or middle

Self-trapping screws 4*25

Metal retainer, roofing nail



Foam rubber wedge

Inroof-mounting

1

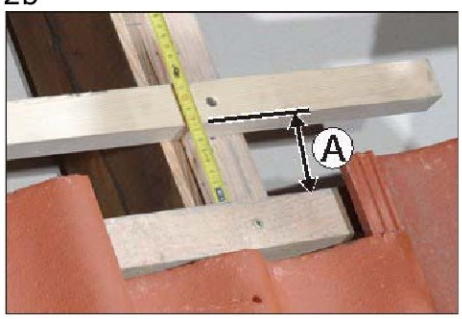
1: Uncover the roof according to the collector surface area

Width: approx. 1.25m per collector + 1.5m
Height: approx. 3.0m for single row installation
Height: approx. 5.0 - 6.0m for double row installation

2a

2a: Attach the installation batten below, self-tapping screws 5*60

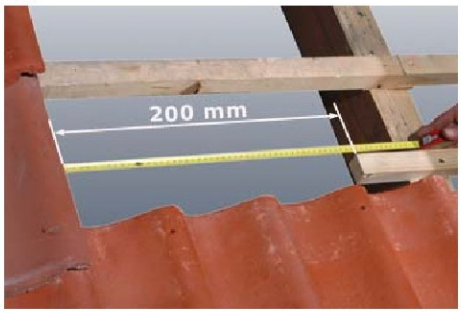
2b



2b: Measurement A = 80mm for tile sheet metal edging

Measurement A = 50mm for shingle and crown tile sheet metal edging

2c



2c: Measurement B = 200mm or tile width + 50mm

3

3: Fasten the attachment bracket on the installation batten as shown on the attachment diagram (page xx), self-tapping screws 5*40

4

4: Set and align collectors on the roof

5

5: Fasten the collectors to the attachment bracket, self-tapping screws 5*40

6

6: Secure the collectors to the upper attachment bracket, 1 bracket in the centre of each collector glass, self-tapping screws 5*40. If necessary, install upper installation batten, self-tapping screws 5*60

7: Hydraulically connect the collectors using short connecting bends

7

8a

8: Connect the roof-integrated connection set (8a/8b). Alternative: Create a CU connection using a soldered connection. Install the sensor with the sensor tube extension at the forward flow.

8b

9a

9: Install the installation batten for the second collector row, self-tapping screws 5*60. Distance between the lower and upper collector row = 200mm

9b

10

10: Fasten the attachment bracket on the installation batten as shown on the attachment diagram (page 38), self-tapping screws 5*40

11a

11: Set and align the second row of collectors (11a), secure them using the lower (11b) or upper attachment bracket, self-tapping screws 5*40. If necessary, install upper installation batten, self-tapping screws 5*60.
Hydraulically connect the second row of collectors as shown in point 7 and 8.

11b

Inroof-mounting

Warning: The collector array must be checked for leaks before installing the metal casing!

12:Slide the front corner section to the left into the required nut of the glass lower bar. Note: Before installing the underside of the metal casing, remove the collectors' lower protection piece!

12

13

13:Slide the front section into the middle

14:Slide the front corner section to the right

14

15

15:Secure the front section on the required positions (stampings) using sealed plumbing screws 4.5*35

Repeat steps 16, 17, 19, 20, 21 and 22 for the second collector row accordingly!

16

16: Install the side pieces on the right and left. Upper edge of the sheet metal flush with the upper edge of the collector

17

17: Secure the side pieces to the roof batten using metal retainers and roofing nails

18

18: Place the metal wedge in the middle between the collector rows and tighten it on the roof structure using self-tapping screws 6*120. Install the side piece connector on the right and left

19

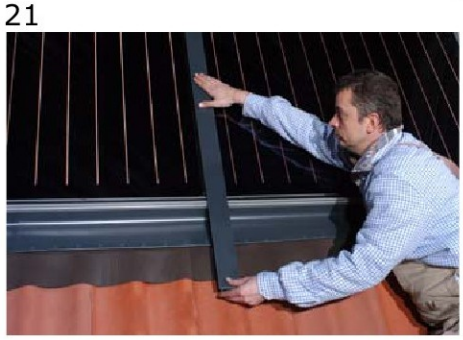
19:Attach the lateral cover strip on the right and left

20

20:Attach the side tin cover strip to the front corner section on the right and left at the collector using sealed plumbing screws 4.5*35

21

21:Push the middle cover strip (between adjacent collectors) from the bottom as far as it can go



22

22:Tighten the middle cover strips using two self-drilling sealed plumbing
screws and the lateral tin cover strip using one self-drilling sealed plumbing screw 3.9*13

23

23:Slide in the middle cover on the left

24

24:Slide in the middle cover to the centre

25

25:Slide in the middle cover on the right

26

26:Tighten the left and right middle cover to the side tin cover strip and the collector on the required position using a self-drilling sealed plumbing screw 4.5*35

27a

27: Place the metal wedge in the middle above the collector and tighten it on the roof structure, self-tapping screws 5*120. Hang the left rear corner section (27b) in the collector.

27b

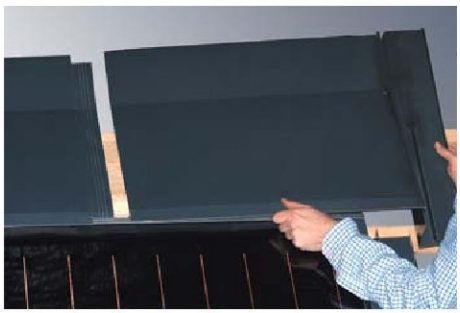
28

28: Tighten the left rear corner section outside of the reinforcing seam on the
wooden wedge, self-tapping screws 4*25

29

29: Hang the middle rear section in the collector and connect the rear left corner section. Tighten the sheet metal outside of the reinforcing seam using a self-tapping screw 4*25.

30



30: Hang the right rear section in the collector and connect it to the middle rear section

31

31: Tighten the rear section on the left and right side to the cover strip and the collector using a sealed plumbing screw 4.5*35

32

32: Laterally secure the right and left rear corner section to the roof batten using metal retainers and roofing nails

33a

33: Glue the foam rubber wedge on the side and the top (applies to sheet metal edgings for tile roofs only!)

33b

34

34: Cover the collector field. If necessary, the tile must be cut to the appropriate size using an angle grinder. The top projecting end of the tile must be 80 and 140mm over the metal edge

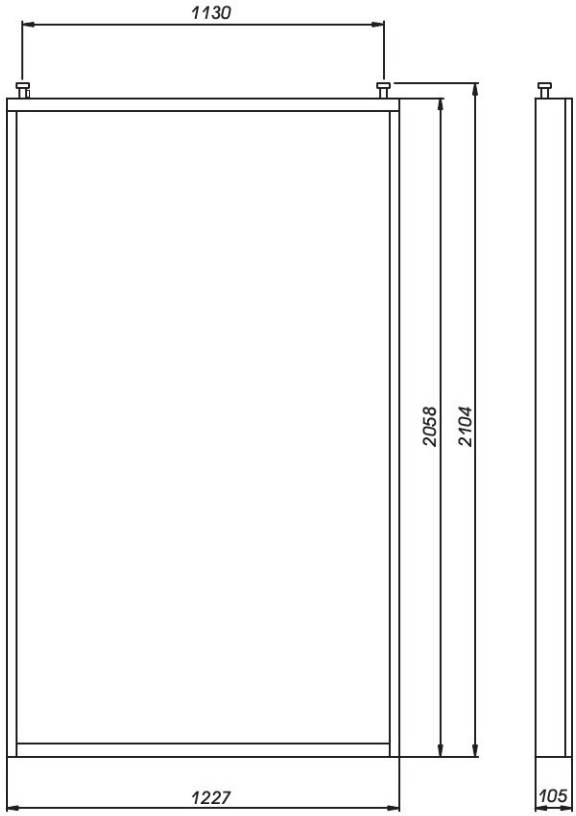
35

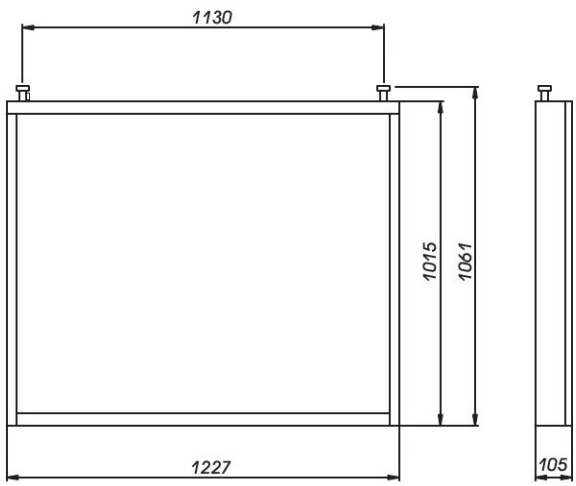
35: Finally, adjust the lead skirting (for sheet metal edging with tile roofs only) to the contour of the tile

36

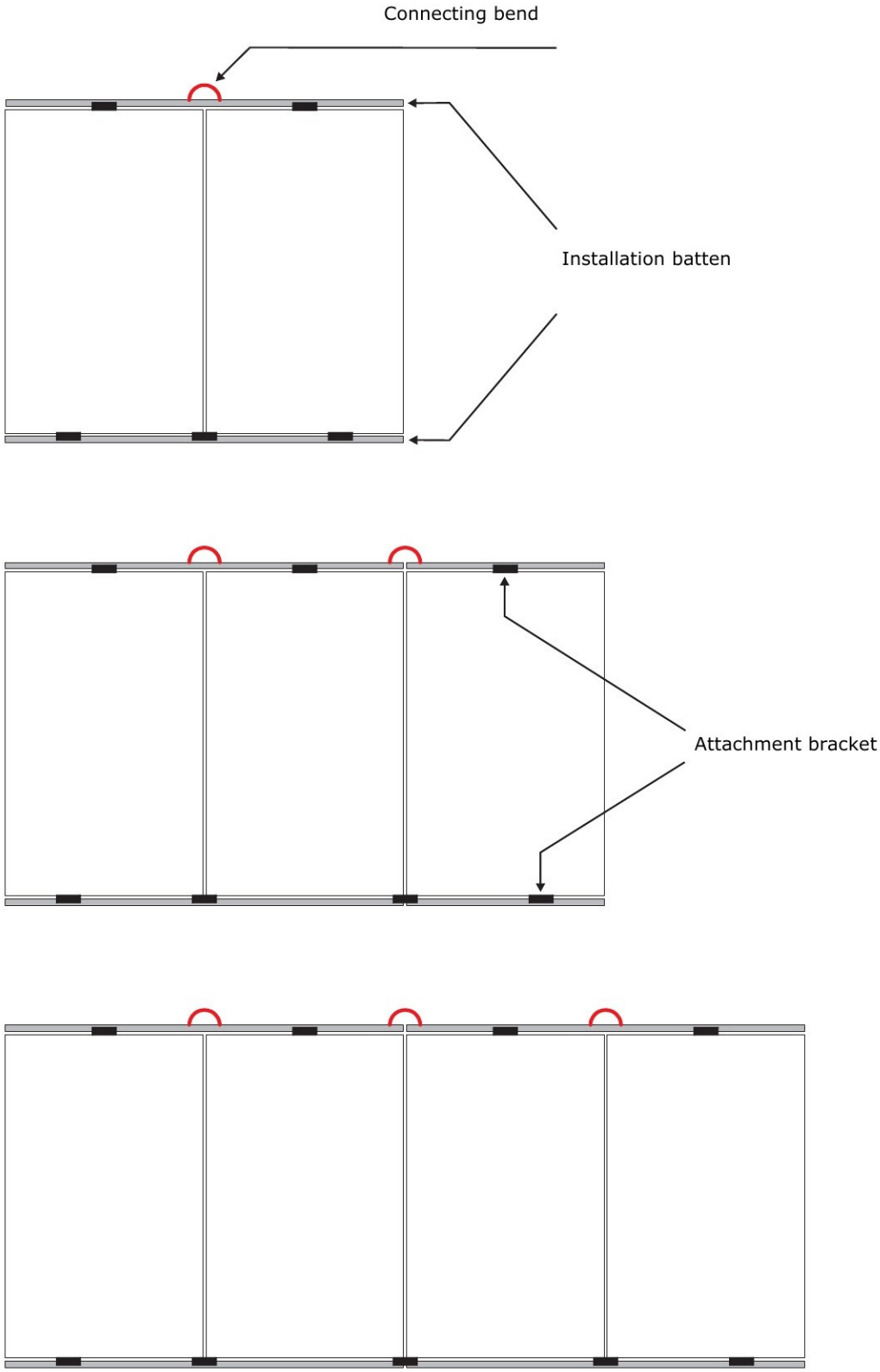
36: Note: When installing the side sections of the plain-tile metal casing, the tiles and metal parts must always be alternately covered!

Technical data		IDMK25	IDMK12			IDMK25	IDMK12
Gross area	m²	2.52	1.25	Weight	kg	49	25
Net area	m²	2.32	1.08	Contents	l	1.7	0.67
Apertur	m²	2.28	1.10	max. Pressure	bar	10	10





Attachment diagram



Flushing and filling

For safety reasons, you should only fill the collectors when there is no direct irradiation from the sun (or cover the collectors). Especially in regions exposed to frost, for flat plate collectors you should use a mixture of (FS) antifreeze with water (40% antifreeze). The solar thermal system should be filled and commissioned within one week of installation, because heat build-up in the collector (array) can damage the flat gaskets in empty systems. If this is not possible, the flat gaskets should be replaced before commissioning to prevent leakage.

Attention: Antifreeze that is not pre-mixed must be mixed with water prior to filling!

Recommended antifreeze for flat plate collectors: TYFOCOR-L

Note: 40% proportion of antifreeze (60%/water) - freezing point: -22° C/solidification point: -26° C
50% proportion of antifreeze (50%/water) - freezing point: -32° C/solidification point: -44° C

It may not be possible to completely empty collectors once they have been filled. For this reason, collectors exposed to frost should only be filled with a water/antifreeze mixture, also for pressure and function tests. Alternatively, the pressure test can also be carried out using compressed air and leak detection spray.

Installing the temperature sensor

The temperature sensor should be installed in the sensor sleeve nearest to the collector array flow. To ensure optimal contact between the sensor and the surrounding environment, the gap between the sensor sleeve and the sensor element should be filled with a suitable conducting compound. All materials used for installing temperature sensors (sensor element, conducting compound, cables, sealing and insulating materials) must be suitably temperature resistant (up to 250° C).

Operating pressure

The maximum operating pressure is 10 bar.

Bleeding

The system must be bled:

- when commissioning the system (after filling the collectors)
- 4 weeks after commissioning
- when necessary, e.g. if there are malfunctions

Warning: Risk of scalding due to steam and hot heat transfer fluid!

Only operate the bleeding valve if the temperature of the heat transfer fluid is **< 60° C**.
When bleeding the system, the collectors must not be hot! Cover the collectors and, if possible, bleed the system in the morning.

Check heat transfer fluid

The heat transfer fluid must be checked every two years with regard to its antifreeze and pH value.

- Check antifreeze using antifreeze tester and replace or refill if necessary!
  Target value is ca. - 25° C and - 30° C depending on climatic conditions.
- Check pH value with a pH indicator rod (target value approx. pH 7.5):
  If the limit pH value is less than ≤ pH 7, replace the heat transfer fluid.

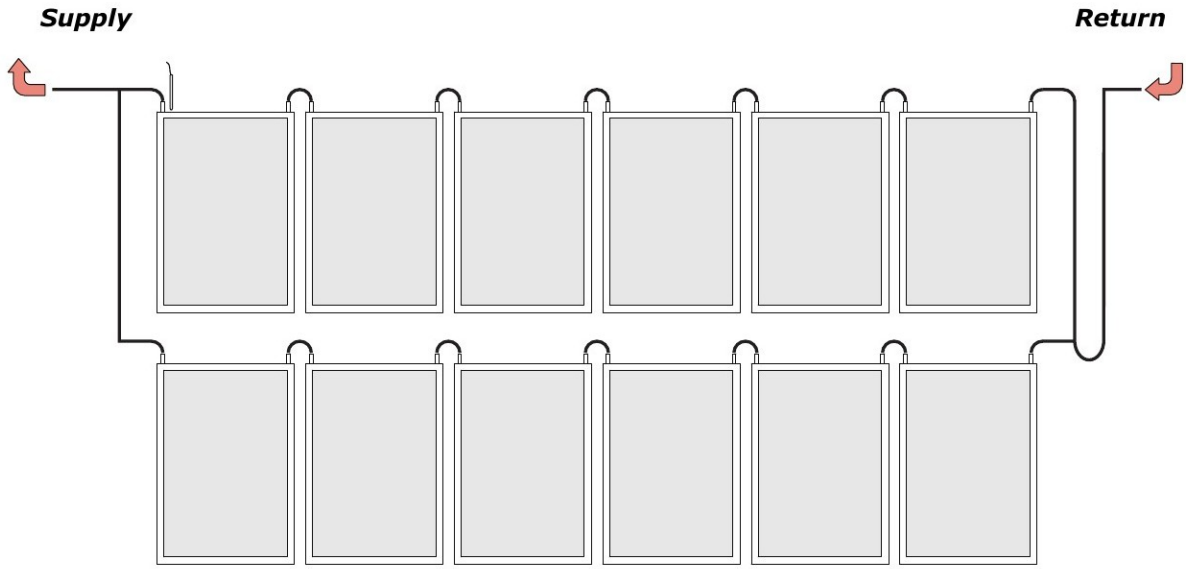
Maintenance of the collector

The collector or the collector array must be inspected visually, once a year, for any damage, leaks and contamination.

Additional recommendations on operation and maintenance can be found in the supplier's general documentation and instructions on commissioning and maintenance.

Connecting the collectors to one another

The diagram below is an example of how the collectors can be connected to one another. However, the actual connection may be different depending on structural conditions. A maximum of 6 collectors may be connected in a series! If a collector panel is made up of more than 6 collectors, the panel must be connected several times in parallel.



Mass flow rate

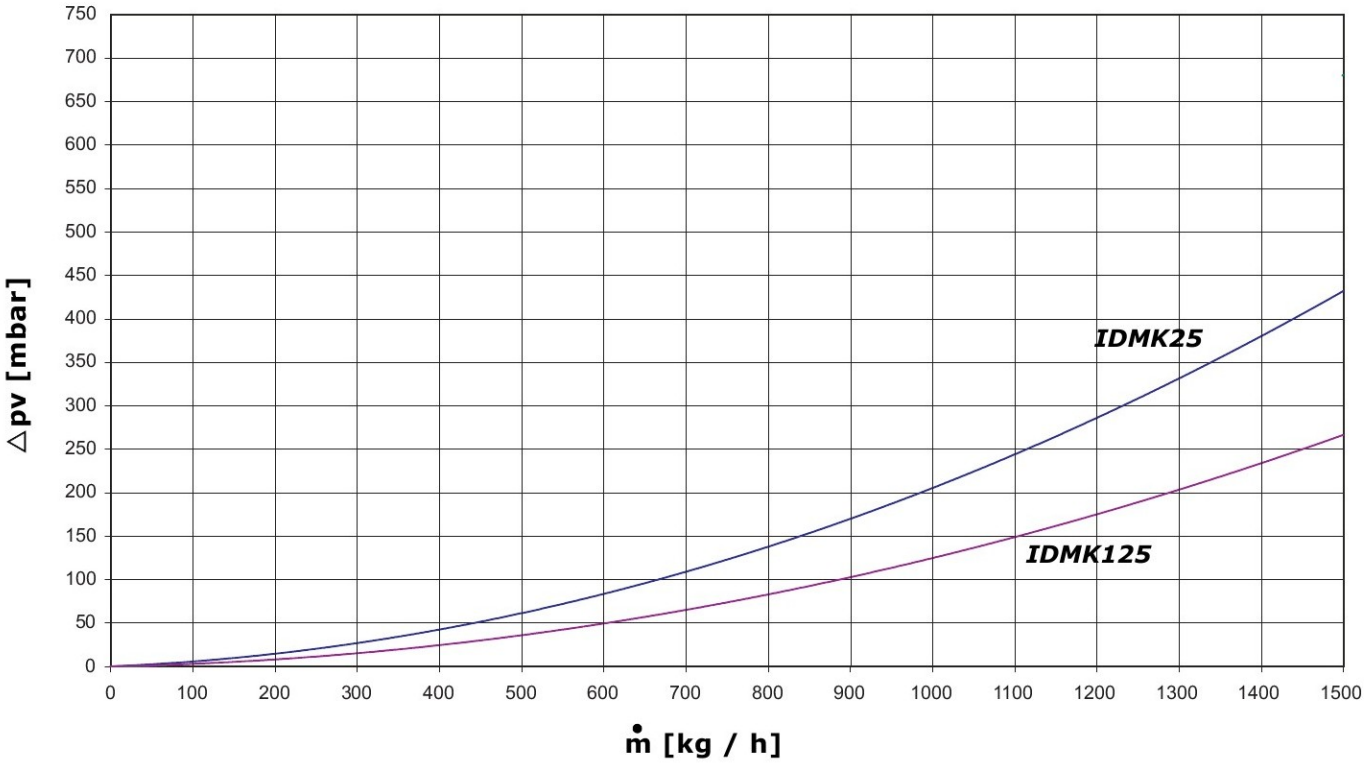
To ensure the performance of the collector, a specific flow rate of 30 l/m²h is to be selected up to a collector panel size of approx. 25m².

Pipe diameters

Dimensions table with a specific flow rate of 30 l/m²h

Collector panel size [m²]	approx. 5	approx. 7.5	approx. 12.5	approx. 25
Pipe diameter / copper [mm]	10 - 12	15	18	22
Pipe diameter / stainless steel corrugated pipe	DN16		DN20	

Pressure loss curve



Pressure loss collector for anti-freeze / water mixture (40% / 60%) at a thermal conducting temperature of 50° C.

Pressure loss curve: $\triangle p = 0{,}0002x^2 + 0{,}00301x$

Mass flow rate [kg/h]	0	50	100	150	200	250	300	350	400	450	500
Pressure loss [mbar]	0	4	8	12	17	21	26	32	38	43	50

Pressure loss collector for anti-freeze / water mixture (40% / 60%) at a thermal conducting temperature of 50° C.

Pressure loss curve: $\triangle p = 0{,}0001x^2 + 0{,}0142x$

Mass flow rate [kg/h]	0	50	100	150	200	250	300	350	400	450	500
Pressure loss [mbar]	0	2	4	6	9	12	15	19	23	27	31

Guarantee and Warranty

No liability is accepted for incorrect use, unauthorized changes to the assembly components, or the resulting consequences.

All information and instructions in this manual refer to the current state of development. Please always use the respective assembly instructions supplied with the collectors.

Figures and illustrations used. Due to the possibility of setting and printing errors, and to the need for continuous technical change, please understand that we cannot accept liability for the correctness of the data.

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