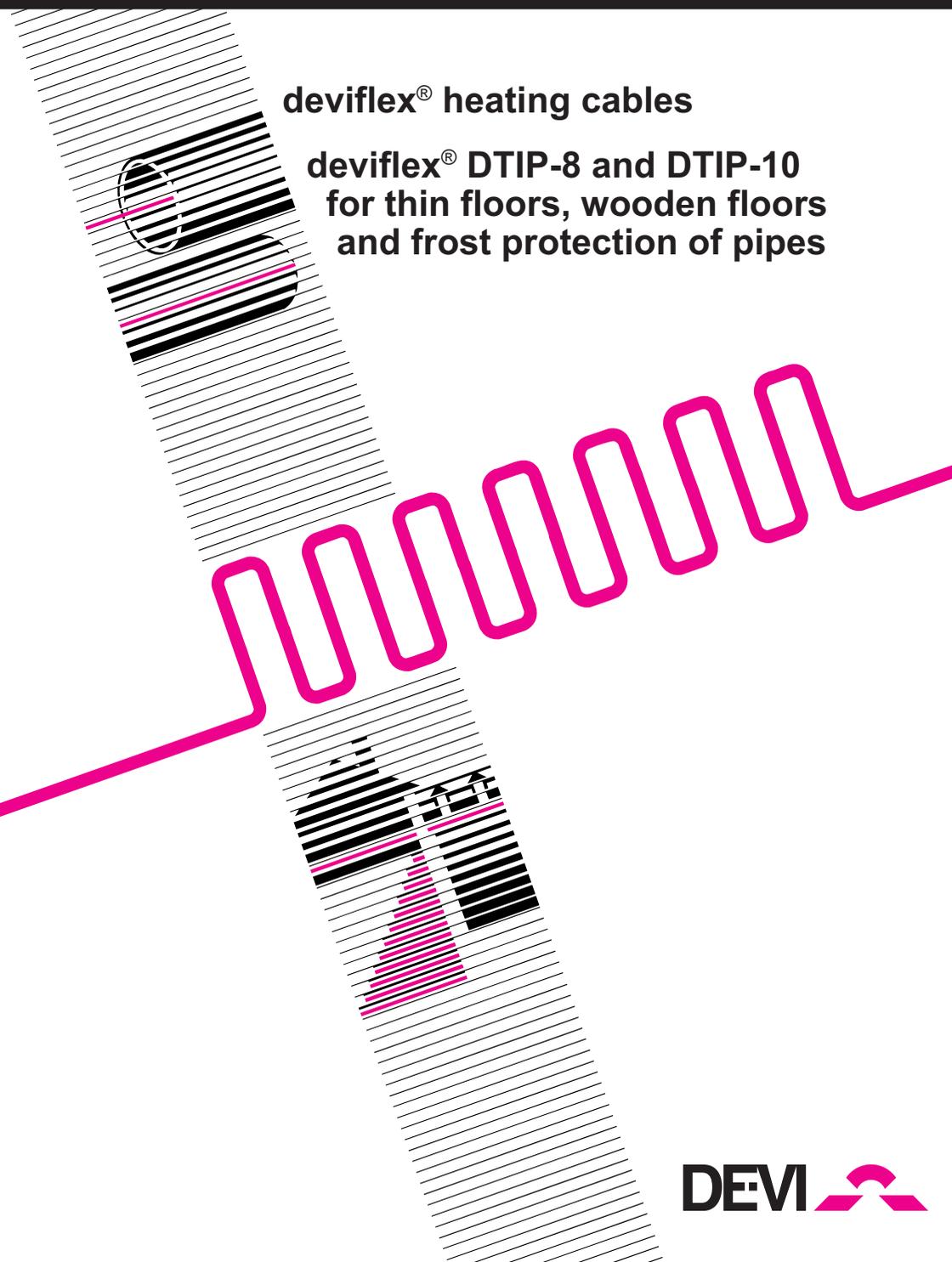


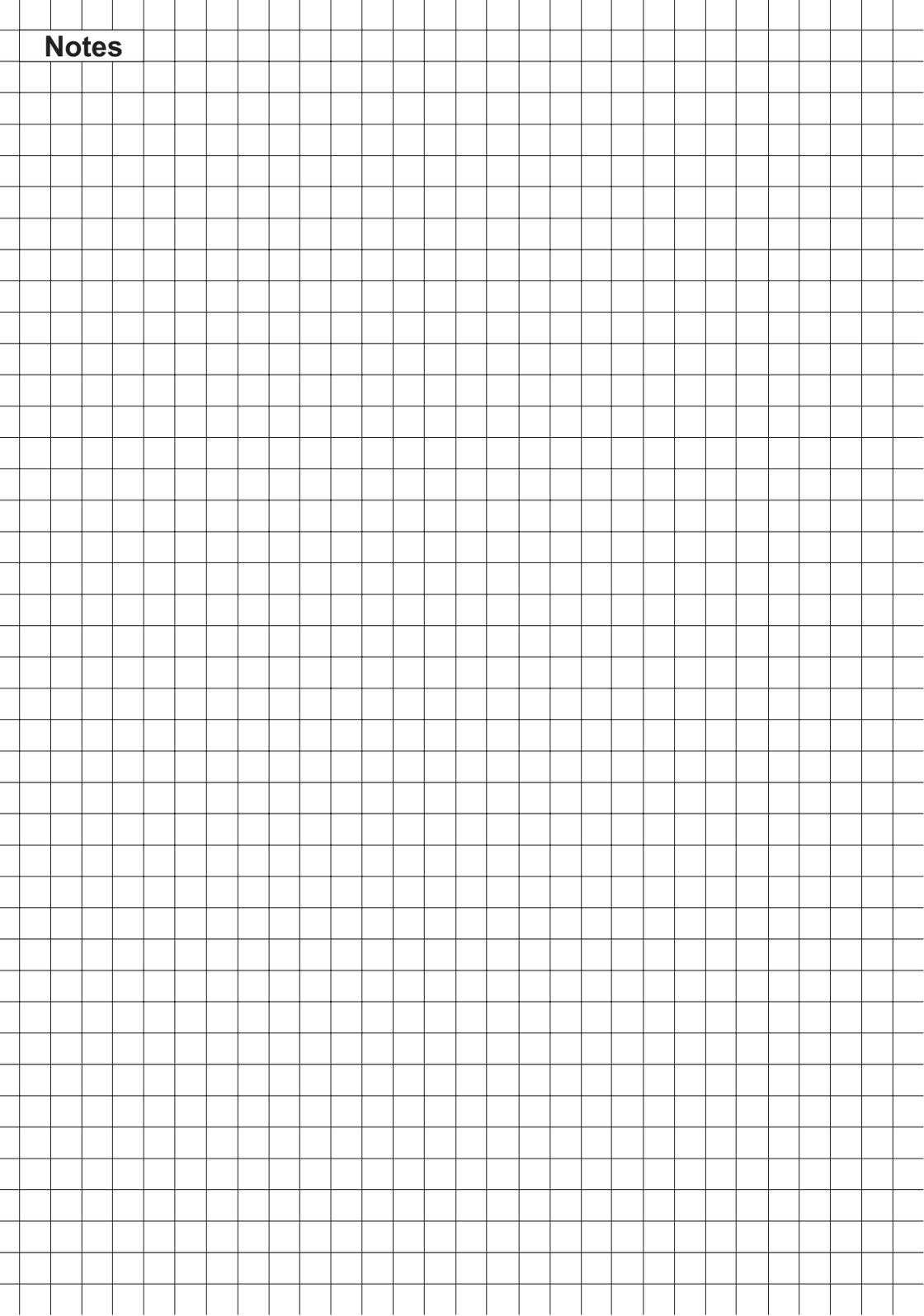
Installation Instructions

deviflex® heating cables

**deviflex® DTIP-8 and DTIP-10
for thin floors, wooden floors
and frost protection of pipes**



Notes



deviflex® DTIP-8 and DTIP-10 heating cables

deviflex® DTIP-8 and DTIP-10 heating cables are used in a wide variety of installation areas. They are especially well suited for comfort heating in wooden floors, or floor renovations, (also called thin floors), where there is a demand for a low building height. They are also used in connection with

frost protection of pipes. These are the three areas that will be covered by this installation instruction. Should you wish for further information concerning other areas of use for these cables, please see the **DEVI** heating compendiums.

Areas of use

Area of use	Normal W/m ²	Max. W/m ²	DTIP-8	DTIP-10	Sensor
Bathrooms	100 - 150	200		X	Floor
Sitting rooms	80 - 100	150		X	room
Wooden floors	60 - 80	80	X	X	combination
Thin floors	100 - 120	150	X	X	combi/floor
Offices	60 - 100	200		X	room
Bedrooms	60 - 100	100		X	room
Hall ways	50 - 100	200		X	room
Basic heat	40 - 60			X	floor
Sports halls	50 - 80			X	ground
Nurseries (plants)	50 - 100	100		X	ground
Work shops	80 - 100	200		X	room
Entry hall	70 - 150	200		X	floor
Freezers	10 - 20		X	X	floor
On pipes	7 - 40		X		wire

IMPORTANT!

- The heating cable must not be cut or subjected to strain around the area of the coupling.
- The cable must be connected by an authorised electrician.

Cable specifications

Cable	deviflex® DTIP-8 and DTIP-10
Type	Twin conductor with screen
Voltage	230 V AC
Effect	8 W/m and 10 W/m
Diameter	Ø 7.4 mm
Cold tail	2.5 m, 3 x 1.5 mm ²
Conductor insulation	XLPE (Polyethylene)
Sheath insulation	PVC 90°C
Max. temperature	65°C

Connections

Live	- Brown
Neutral	- Blue
Earth	- Yellow/green

General installation instructions

When installing heating cables the following should be observed:

1. **The heating cable must only be used in the manners recommended by DEVI and should be properly connected to the main electrical source.**
2. Connection of the heating cable must be done by an authorised electrician.
3. The maximum effect for the different installations and operating effects must be observed.
4. **The heating cable must be protected against excess strain and tension.**
5. The area below the heating cable must be clean and free from sharp objects.
6. The heating cables bending diameter must not be less than 6 x the cables own diameter.
7. The heating cable lines must not touch each other and must not cross.
8. **The heating cables screen must be earthed in accordance with the local electricity laws.**
9. The heating cable must not be cut/shortened or and must not be exposed to strain in the areas of the cold cable coupling.
10. The heating cables Ohm value should be measured after the cable has been laid and after the concrete has been cast. The heating cables Ohm value should be as stated on the coupling label: -5 - +10%.
11. It must be possible to switch off the heating cable. We recommend a **devireg**[®] thermostat (see „Regulation“).
12. It is recommended to draw up a plan, showing where the heating cable as well as the cold tail and end coupling are positioned.

At low temperatures the heating cable can become stiff and difficult to work with. This can be solved by connecting the cable to the mains, *for a brief period of time*.

The heating cable must be rolled out when this is done!

It is not recommended to lay the cable at temperatures below -5°C.

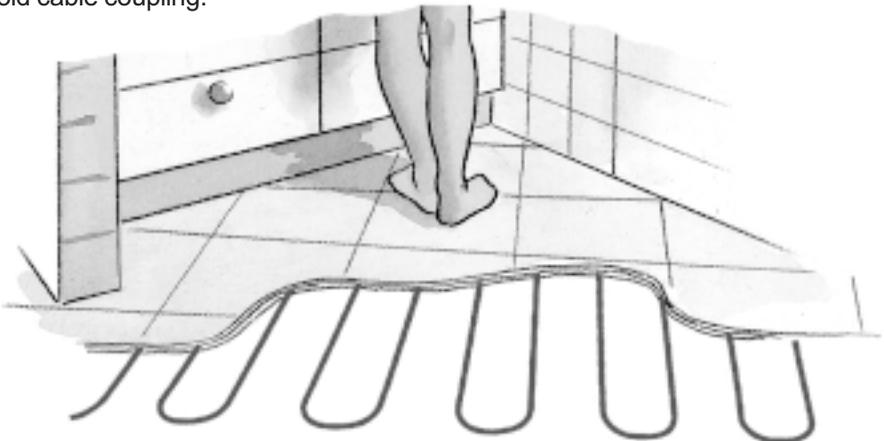


Fig.1

Installation under wooden floors on joists

deviflex[®] heating cables can be used in connection with wooden board floors or laminated wooden floors resting on sleepers. To achieve the best results insulation must be laid below the cables.

The result is a warm, healthy and dry floor which is maintenance free.

Measurements of effect

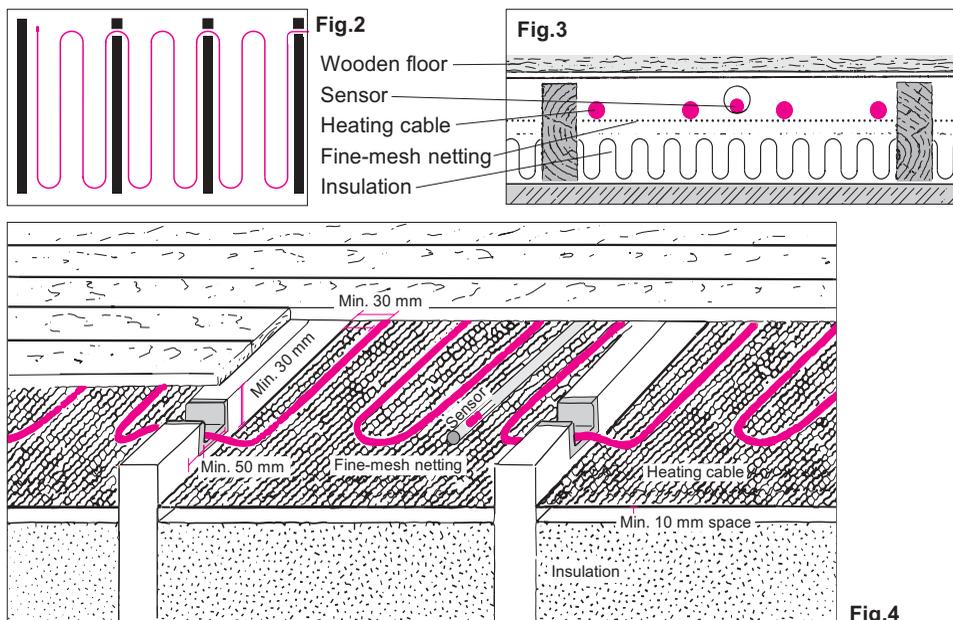
Heating cables for wooden floors must have a maximum effect of 10 W/m with a total effect of maximum 80 W/m². The floor manufacturers' recommendations for maximum floor temperature must always be observed and carried out by means of an effective regulator.

Installation

The **deviflex**[®] heating cables are laid

out on top of wire mesh netting, (chicken wire), which is stretched out and fastened between two sleepers above the insulation.

- The heating cable must not come into contact with the insulation.
- The wire mesh netting is placed so that there is a minimum of 30 mm between it and the underneath of the floor surface.
- The heating cable is laid parallel to the sleepers with a minimum distance of 30 mm from the sleepers.
- The cable is attached to the wire mesh netting at intervals of 30 cm.
- Where the cable crosses a sleeper a path of 30 mm should be cut out of the wood and lined with aluminium foil or a similar fireproof material. There must only be one cable in each path.



The **deviflex**[®] heating cable must be regulated by a thermostat. There must always be installed a

thermostat and floor sensor with a temperature limiting function, i.e. **devireg**[®] 122 or **devireg**[®] 522.

Installation in thin floors (renovation of floors)

deviflex® cables can be used in connection with renovation of floors and where there is a demand for a low building height. The cables can be laid on top of existing wooden or concrete floors. The result is a maintenance free, warm and dry floor.

Measurements of effect

In connection with thin floors the heating cable has a maximum effect of 10 W/m. The total effect should preferably be between 100-120 W/m² depending on the climatic conditions and insulation. The cables C-C distance should not exceed 10 cm as this may result in cold zones on the floor. The floor manufacturers' recommendations for maximum floor temperature must always be observed and carried out by means of using an effective regulator.

Installation

- The heating cable can either be laid on a **devifast** fitting band, wire mesh netting with a diameter of 1 mm, or glued directly onto non-flammable surfaces.
- The cable is secured at 30 cm intervals using a glue gun where necessary.
- A damp proof membrane must always be installed in connection with wet room floors.

- A fire resistant material must be laid between the heating cables and wooden or other flammable floors where the cables are to be laid directly on the floor surface. This could be for example a 5 mm layer of compound, a 6 mm thick plaster board, wire mesh netting with 1 mm diameter and mesh of 20 x 20 mm.

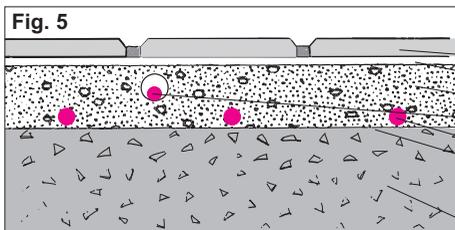
- With regard to the casting of the concrete/concrete compound on the floor the manufacturers instructions must be observed.

The heating cable must be regulated by a thermostat with a room sensor and/or floor sensor.

In connection with comfort heating a floor sensor is used and with total heating a room sensor. In connection with bathrooms always use a floor sensor. Under wood/vinyl a system which can limit the floor temperature should be used. (devireg® 122 / 522).

The maximum temperature under a wooden floor laid directly on concrete is 26°C. The manufacturer of the floor surface should be informed that there will be floor heating for advice concerning glue types etc.

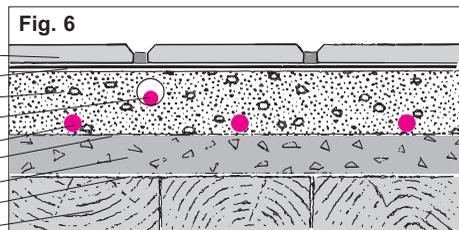
Thin floor on existing concrete floor



- a) Klinkers
- b) Dampproof membrane
- c) Compound

- d) Sensor
- e) **deviflex®** heating cable
- f) **devifast** fitting band

Thin floor on existing wooden floor



- g) Non-flammable material
- h) Fine-meshed netting
- i) Existing floor

Frost protection of pipes

deviflex® cables can be used in connection with frost protection of metal and plastic pipes and as an effective deterrent against paraffin separation in the pipes of oil heaters. We do not recommend an effect larger than 8 W/m when installing cables on pipes.

Measurements of effect

The table below is based on frost protection of pipes down to - 25°C, when the appropriate insulation is used in connection with a **deviflex**® DTIP-8 cable. Also shown are the minimum amount of metres of cable to be used per metre of pipe.

Pipe Dimensions Inches mm		Insulation thickness in mm			
		10	20	30	50
		m heating cable per m pipe/increasing in cm			
1/2"	15	1,5/8	A	A	A
3/4"	20	2,0/5	1,3/11	A	A
1"	26	2,4/5	1,6/9	1,2/17	A
1 1/4"	32	2,8/5	1,9/8	1,6/10	1,2/19
1 1/2"	39	3,3/5	2,2/8	1,8/10	1,3/19
2"	52	3,9/5	2,6/8	2,0/10	1,4/19
2 1/2"	65	4,5/5	3,0/8	2,3/10	1,6/19
3"	78	5,0/5	3,5/8	2,7/10	2,0/19

X/Y

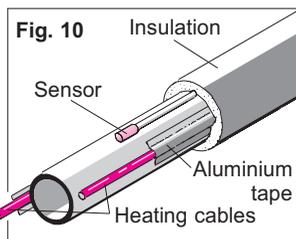
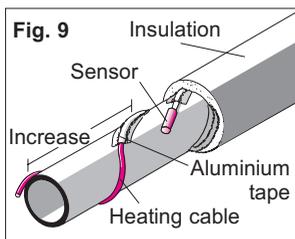
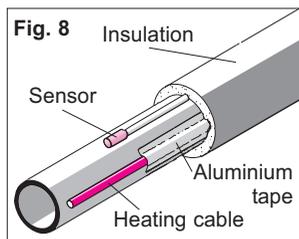
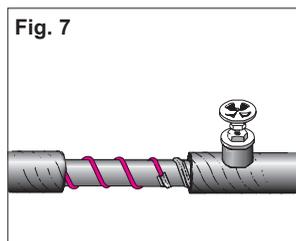
X = metres of heating cable per metre of pipe.
Y = increase in cm (see fig. 9).

A

= 1 straight cable line, i.e. 1 metre cable per 1 metre pipe (see fig. 8).

■

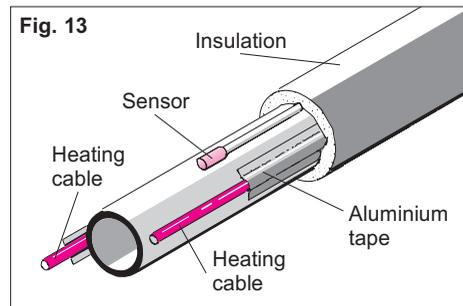
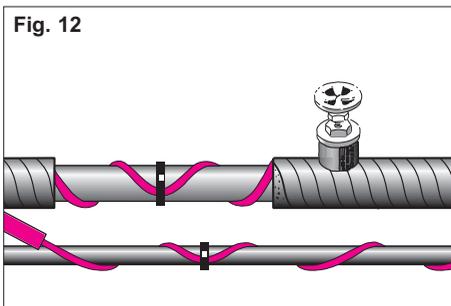
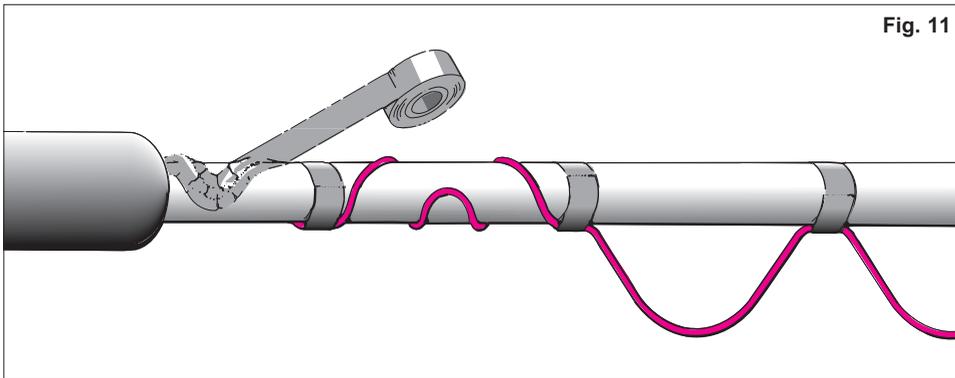
= Possibility of using 2 parallel cable lines instead of winding the cable around the pipe (see fig. 10).



Installations in general

- There must be a close fit between the heating cable and the pipe.
- The heating cables bending diameter must not be less than 6 x its own diameter.
- The heating cables must not be fitted over sharp edges, cross or touch itself. It must also be spared for mechanical strain.
- The full length of the heating cable must be secured with aluminium tape. This also acts as a reflector and prevents the insulation from coming into contact with the heating cable, which may result in overheating.
- The coupling between the heating cable and the cold tail must also be be secured to the pipe with aluminium tape.
- Never use clips which can squeeze the cable.

- Two parallel lines are secured, one on each side of the pipe (see fig. 13).
- Where it is intended that the heating cable should be wound around the pipe - but the pipe is not situated in an easily assessable place, you can choose to use the method shown in fig. 11 +12. First find the correct length of cable in the above table and then alternate between hanging the cable loops first on the left and then on right hand side of the pipe.
- The cable's resistance and insulation must be tested both before and after the pipe has been insulated. The heating cables Ohm value should be as stated on the coupling label: -5 - +10%.
- The heating cable is regulated by a **devireg**® thermostat.



Calculating the C-C distance

There are two ways to calculate the C-C distance, either by using the length of the cable or by using the total effect.

$$C-C = \frac{\text{Sum m}^2 \text{ usable floor space} \times 100}{\text{Cable length}}$$

= C-C distance in cm.

Or

$$C-C = \frac{\text{Effect per metre cable} \times 100}{\text{Effect per m}^2 \text{ usable floor space}}$$

= C-C distance in cm.

Regulation

The optimal control of **deviflex**[®] heating cables is achieved by using **devireg**[®] electronic thermostats. **devireg**[®] thermostats give a quick and effective regulation and take both comfort and economy into consideration.

There are a wide variety of **devireg**[®] thermostats which can be chosen from according to the demands of the individual installation.

The external room sensors and wire sensors have the same Ohm values and can therefore be used ad hoc with the different thermostats. (Ohm value = 15 kOhm/25°C).

Type	Mounting	Temp. range	Sensor A	Sensor B	Night set-back	Colour	Temp. limiter
120	On wall	5-35°C 5-50°C	Wire/ built-in	Wire/	5°C	Polar-white	20-60°C
230	Flush with wall	5-50°C	Wire		5°C	Grey	
520	Flush with wall	5-30°C 5-45°C	Wire/ built-in	Wire	5°C	Polar-white	20-60°C
330	DIN-rails	15-30°C 5-45°C	Wire/ built-in		5°C	Grey	
316	DIN-rails	5-50°C	Wire		0-8°C	Grey	
610	Outdoors splashproof	-10-50°C	Wire			Polar-white	

For choice of thermostats - please see product catalogue!

Sensors and other accessories

- Wire sensors 2.5 m, 6.0 m and 10.0 m.
- Room sensor.
- Remote regulation for thermostats.
- **devitime** 301 timer.
- **devifast** fitting band, 5 m and 25 m.
- Aluminium tape, 38 mm x 50 m rolls with 'WARNING' text.



**Draw up a
plan of the
cable-layout
on this page**

The DEVI Warranty:

You have purchased a **deviheat**[®] system, which we are certain will increase your home comfort and economy.

deviheat[®] provides complete heating solutions with **deviflex**[®] heating cables or **devimat**[®] heating mats, **devireg**[®] thermostats and **devifast** fitting bands.

If, however, contrary to all expectations, a problem should occur with your heating system, we at **DEVI**, with manufacturing units in Denmark, are, as European Union suppliers, subject to general product liability rules, as stated in Directive 85/374/CEE, and all relevant national laws which implies that:

DEVI provides a warranty for **deviflex**[®] heating cables and **devimat**[®] heating mats for a 10 year period and all other **DEVI** products for a 2 year period against defects in material and production.

The guarantee is granted on the conditions that the WARRANTY CERTIFICATE on the overleaf is filled out properly in accordance to instructions and that the defect is inspected by, or presented to, **DEVI** or authorised **DEVI** distributor.

Please note that the wording of the WARRANTY CERTIFICATE must be provided in English or local language with the ISO code for your country in the upper left corner of the front page

of the installation instruction in order to release the warranty.

The obligation of **DEVI** will be to repair or supply a new unit, free of charge to the customer, without secondary charges linked to repairing the unit. In case of defective **devireg**[®] thermostats, **DEVI** reserves the right to repair the unit free of charge and without unreasonable delay to the customer.

The DEVI warranty only covers connections made by authorised electricians and installations performed in accordance with the installation instruction, and does not cover faults caused by incorrect designs supplied by others, misuse, damage caused by others, or incorrect installation or any subsequent damage, that may occur. If **DEVI** is required to inspect or repair any defects caused by any of the above, then all work will be fully chargeable.

The DEVI warranty is void, if payment of the equipment is in default.

At all times, we at **DEVI** will respond honestly, efficiently and promptly to all queries and reasonable requests from our customers.

The above mentioned warranty concerns product liability whereas matters in relation to legislation on sale of goods shall be referred to national law.



Warranty Certificate

The DEVI Warranty is granted to:

Name:

Phone:

Address:

Postal code:

Please Observe!

In order to obtain the **DEVI Warranty**, the following must be carefully filled in. See other conditions on the overleaf.

Cable layout contractor:

Lay-out date:

Electrical Installation by:

Installation date:

Cable length:

Watt:

Stock code:

Cable code:

Joint code:

Application:

- Concrete
 Wooden floor

- Pipes
 Roof and roofgutters

- Ground

Suppliers Stamp:

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