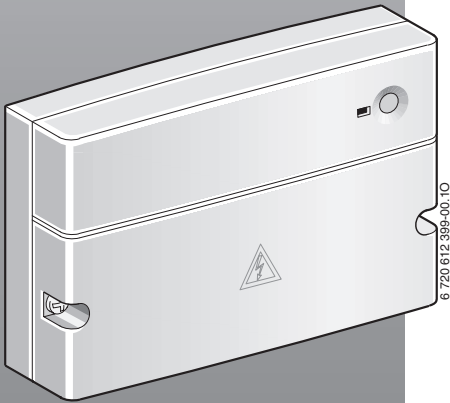


INTELLIGENT SOLAR MODULE ISM 1

FOR USE WITH THE FOLLOWING APPLIANCES AND ACCESSORIES:

CDI SYSTEM BOILER FITTED WITH OPTIONAL INTEGRAL DIVERTER VALVE
FR110 PROGRAMMABLE ROOM THERMOSTAT
FW100 WEATHER COMPENSATION CONTROLLER



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Information regarding this documentation



Hand all documentation enclosed to the user.

1 Symbols and safety precautions

1.1 Symbols



Safety instructions in this document are identified by a warning triangle and are printed on a grey background.

Signal words indicate the seriousness of the hazard in terms of the consequences of not following the safety instructions.

- **Caution** indicates that minor damage to property could result.
- **Warning** indicates that minor personal injury or serious material losses could result.
- **Danger** indicates that serious personal injury could result. In particularly serious cases, lives could be at risk.



Notes are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.

Notes contain important information in cases where there is no risk of personal injury or material losses.

1.2 Safety precautions

- ▶ These instructions must be observed to ensure correct operation.
- ▶ Install and commission the boiler and all accessories in accordance with the associated instructions.
- ▶ Allow only qualified installers to install accessories.
- ▶ Use these accessories exclusively in conjunction with the controllers and boilers listed.
Observe connection diagram.
- ▶ This accessory may require a different voltage. Never connect the low voltage side to the 230 V mains or vice-versa.
- ▶ Before installing these accessories: Isolate voltage supply (230 V AC) to the heating appliance and all additional devices using the bus.
- ▶ In case of wall mounting: Never install this accessory in damp areas.

2 Technical data for the accessory item

2.1 Intended use

This module ISM 1 is designed to control the components of a solar heating system that form part of a general heating system equipped with controllers FW 100 or FR 110.

2.2 Standard package

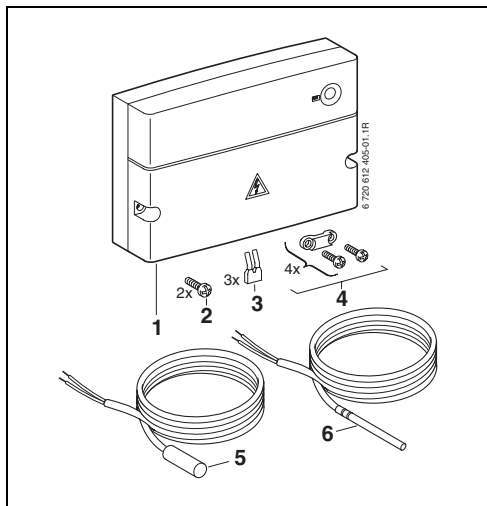


Fig. 1

- 1 ISM 1
- 2 Screws for securing the top section
- 3 Jumper in place of connecting a temperature limiter TB 1
- 4 Strain relief fittings
- 5 Cylinder temperature sensor (T2)
- 6 Collector temperature sensor (T1)

2.3 Technical data

Standard delivery	Fig. 1, page 4
Dimensions	Fig. 2, page 6
Low voltage	
- BUS	15 V DC
- ISM	230 V AC
- controller	10...24 V DC
- pump	230 V AC
max. power consumption	4 A
Control output	2-wire BUS
max. output	
- per connection (R ₁ - R ₃)	120 W
Measuring range, cylinder temperature sensor	0 ... 99 °C
Measuring range, collector temperature sensor	-20 ... 140 °C
perm. ambient temp.	
- ISM	0 ... 50 °C
- System temperature sensor	0 ... 100 °C
- Cylinder temperature sensor	0 ... 100 °C
- Collector temperature sensor	-20 ... 140 °C
Protection level	IP44
	CE

Tab. 1

Measuring values, cylinder temperature sensor (T2)

°C	Ω	°C	Ω
20	14772	56	3723
26	11500	62	3032
32	9043	68	2488
38	7174	74	2053
44	5730	80	1704
50	4608	86	1421

Tab. 2

Measuring values, collector temperature sensor (T1)

°C	Ω	°C	Ω
-20	198400	60	4943
-10	112400	70	3478
0	66050	75	2900
5	50000	80	2492
10	40030	90	1816
15	32000	95	1500
20	25030	100	1344
25	20000	110	1009
30	16090	120	767
35	12800	130	591
40	10610	140	461
50	7166		

Tab. 3

3 Installation

3.1 Installation



DANGER: Risk of electric shock

- Prior to connecting the power supply, isolate the boiler and all other BUS subscribers from the power supply.

3.1.1 Wall mounting

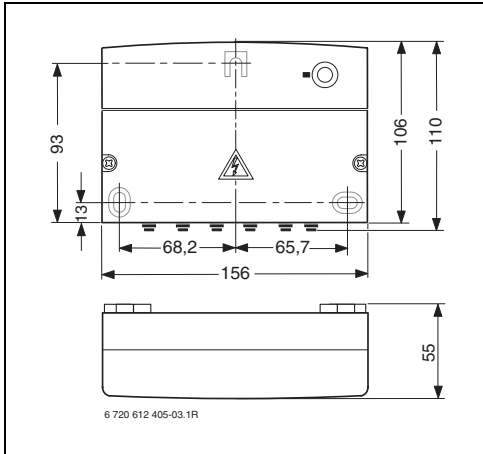


Fig. 2

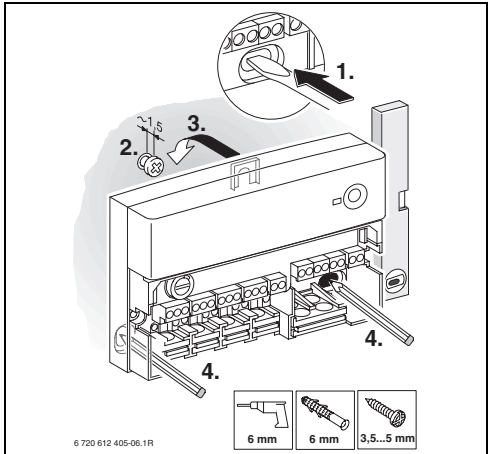


Fig. 4

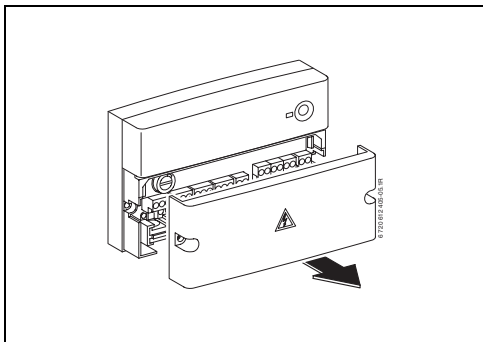


Fig. 3

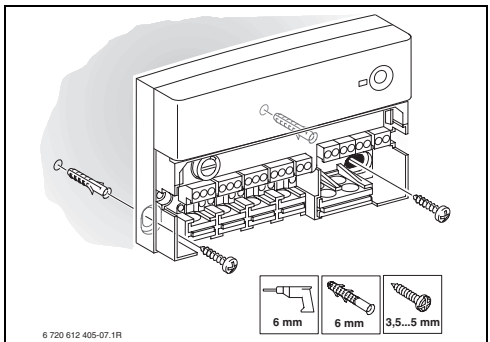


Fig. 5

3.1.2 Mounting on the mounting rail

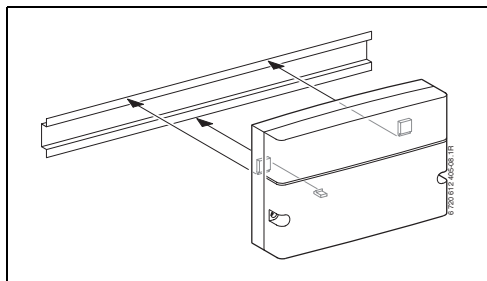


Fig. 6

3.1.3 Removal from the mounting rail

CAUTION: Breaking open the back panel to remove the appliance from the mounting rail reduces the protection level to IP20.

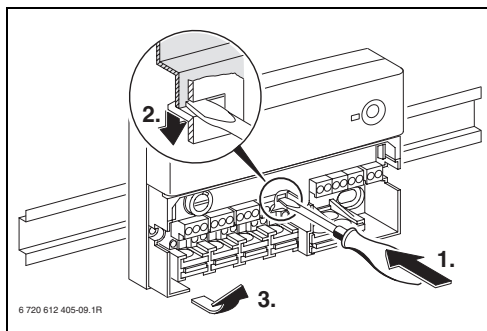


Fig. 7

3.2 Electrical connections

- ▶ Observe current wiring regulations, and use at least cable type H05 VV-... (NYM-I...) for the power connection.
- ▶ Always route cables/leads through the preassembled grommets and apply the strain relief supplied to protect the system against the ingress of dripping water.

3.2.1 Connection - low voltage section with BUS connection

Permissible cable length between the Heatronic 3 with BUS capability and the ISM...:

Cable length	Cross-section
≤ 80 m	0.40 mm ²
≤ 100 m	0.50 mm ²
≤ 150 m	0.75 mm ²
≤ 200 m	1.00 mm ²
≤ 300 m	1.50 mm ²

Tab. 4

- ▶ To avoid inductive interference, lay all bus cables separately to lines of 230 V or 400 V (minimum spacing 100 mm).
- ▶ In case of external inductive interference, shield the cables. This ensures that the cables are shielded from external interference (e.g. heavy current cables, overhead wires, transformer stations, radio and television set, amateur radio stations, microwave ovens etc).

- ▶ When sensor leads are extended, apply the following lead cross-sections:

Cable length	Cross-section
≤ 20 m	0.75 mm ² ... 1.50 mm ²
≤ 30 m	1.00 mm ² ... 1.50 mm ²
≥ 30 m	1.50 mm ²

Tab. 5



To safeguard the splashproof rating (IP): Route cables so that the cable sheath protrudes at least 20 mm into the cable grommet (→ Fig. 8).

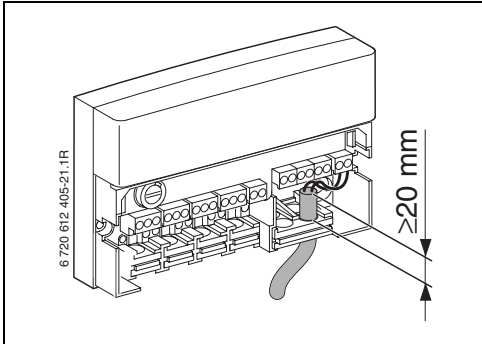


Fig. 8

3.2.2 230 V AC connection

- ▶ Only use electric cable of similar quality.
- ▶ Never connect additional control circuits that regulate other system components to the outputs.



Never exceed the maximum power consumption of the system components as specified (→ chapter 2.3 on page 4).

When connecting several electrical devices:

- ▶ Protect the electrical devices with a separate isolator that provides a minimum contact separation of 3 mm, if the maximum power consumption exceeds the specified value (e.g. fuse, isolator).

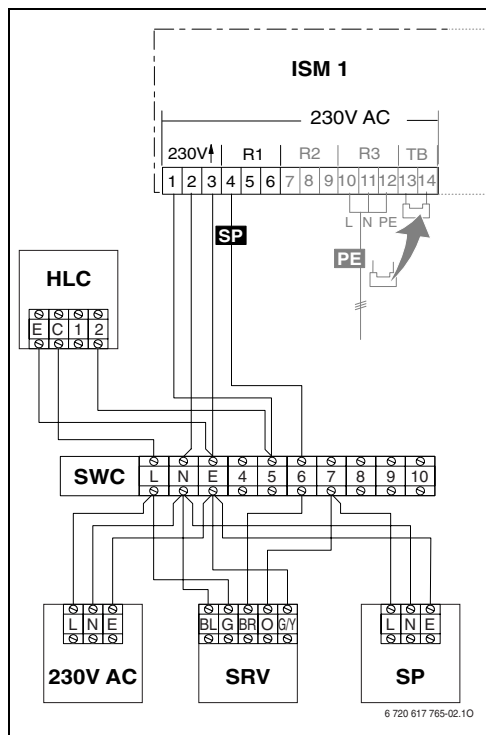


Fig. 9 Electrical connection of Solar Wiring Centre

HLC	High limit control
ISM 1	Module for standard solar heating systems
PE	Circulation pump for thermal disinfection (Option E)
R1...3	Connection for pump or diverter valve
SP	Solar circuit pump
SRV	Solar return two port valve
SWC	Solar wiring centre
TB	Temperature limiter

3.3 Installation of supplementary accessories to protect an unvented domestic hot water cylinder

- ▶ Install supplementary accessories in accordance with legal requirements and the installation instructions supplied.

- HLC
- SRV
- SWC

May be supplied by the unvented domestic hot water cylinder manufacturers, please refer to the installation instructions, otherwise are available at plumber's merchants.

3.4 Connection diagram

Module ISM 1 enables the creation of a standard solar heating system (system 1, solar DHW heating) with thermal disinfection option for the solar cylinder



Pump PE only for thermal disinfection.

Fig. 10 on page 10 shows the connections required for this at module ISM 1.

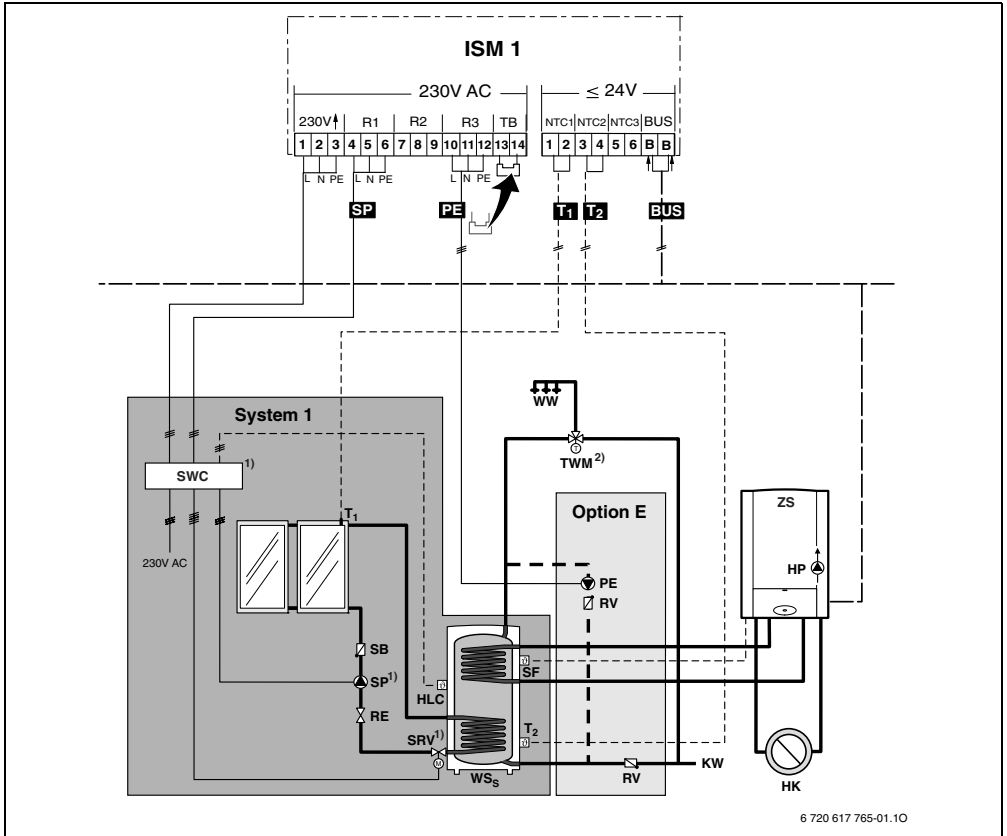


Fig. 10 System 1 with option E

- | | | | |
|-----------------|--|-----------------------|--|
| HK | Heating circuit | SP | Solar circuit pump |
| HLC | High limit control | SRV | Solar return two port valve |
| HP | Heating circuit pump | SWC | Solar wiring center |
| ISM 1 | Module for standard solar heating systems | System 1 | Solar cylinder for solar DHW heating |
| KW | Cold water connection | T₁ | Collector temperature sensor |
| NTC1...3 | Temperature sensor connection | T₂ | Cylinder temperature sensor, bottom (solar cylinder) |
| Option E | Thermal disinfection of solar cylinder (optional hydraulical connection) | TB | Temperature limiter |
| PE | Circulation pump for thermal disinfection (Option E) | TWM | Thermostatic DHW mixer |
| R1...3 | Connection for pump or diverter valve | WW | DHW connection |
| RE | Flow rate adjuster with indicator | WS_S | Solar DHW cylinder |
| RV | Non-return valve | ZS | Solar boiler with optional built-in diverter valve |
| SB | Gravity brake | 1) | Electrical Connection (→ Fig. 9) |
| SF | Cylinder temperature sensor (boiler) | 2) | Instal as close to the cylinder hot water outlet as possible |

4 Commissioning



CAUTION: A fault condition could arise if power is supplied to the BUS before all components are connected.

- ▶ Connect all BUS subscribers prior to supplying the BUS with power.

5 Fault mode

The operating display indicates the operating state of accessories.

Faults are indicated in the controller display or that of the respective remote control.

Operating display	ISM response	Fault/Remedy
constantly OFF	–	Switch ON power. Replace fuse (→Fig. 11).
		HLC on unvented domestic hot water cylinders is open circuit. Reset and investigate cause of operation. If water is also seen discharging from any of the cylinder safety valves, a suitably qualified installer should be contacted immediately.
flashing	Controlled emergency mode: The ISM tries to respond to the fault with an alternative control strategy.	The system yield is largely maintained. Nevertheless, the fault should be remedied, not later than during the next service.
constantly ON	Standard mode	not a fault

Tab. 6

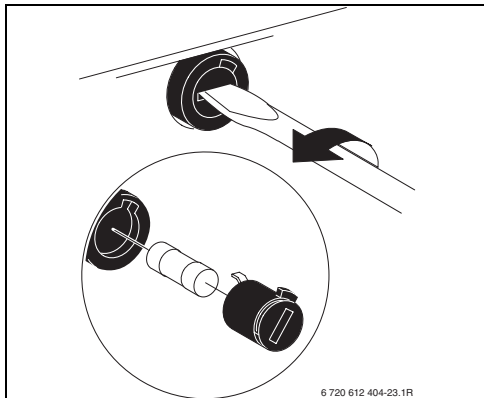


Fig. 11



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