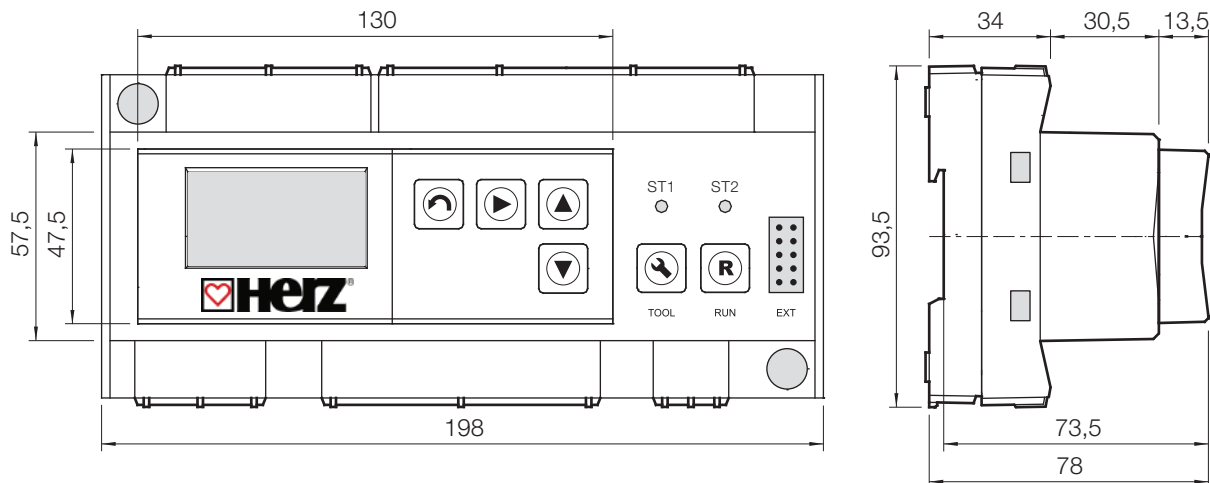


HERZ-Microprocessor Controller XF-5000

Data sheet for Microprocessor F 7793 50, Issue 0216

☑ Dimensions in mm



☑ Description

HERZ Microprocessor Controller XF-5000 is designed for the automating and management of thermo technical, thermo energy and technological systems as a freely programmable logic controller. It comes with a set of pre-programmed applications for heating, cooling, ventilation and air-conditioning systems. The user can also take advantage of the user-friendly software tools and develop a regulating program for specific needs and save it in the controller's internal memory.

The controller can be used in its basic form or with additional modules, which increase the number and type of digital input/output signals, analogue inputs and outputs and available communication protocols. Optional functional keyboard and graphic LCD screen enable an overview of the current measured values, input of setpoint values and "manual" control of electric actuators. Information is organized on two sets of screens. The controller can be used either with an optional console or operator panel.

The first set consists of the INFO screens which show system information (measured and set values, input and output, statuses, alarms, etc.). INFO screen layout and contents can vary in accordance with the currently active application. During the compilation of user-created programs, the user himself creates corresponding INFO screens. The second set consists of standard MENU screens where user can see and change set values, input and output status, date and time, communication parameters, currently active application, user interface language, etc. A password protection is integrated for prevention of unauthorized access.

Set values are permanently stored in controller's internal memory. Time-dependent applications (heat reduction, closed timeinterval and time-sequence applications, scheduled change of set values) are enabled by built-in real time clock.

MBUS master communication with external MBUS power supply module enables direct connection with max. 4 devices equipped with MBUS slave port (heat meters, circulating pumps and similar "smart" devices). The controller can be connected to the supervisory control and data acquisition systems (SCADA) using one of the available communication interfaces (RS232, RS485, Ethernet). Built-in standard communication protocols enable the controller to be integrated into any of the major SCADA systems and full compatibility with the standard software development tools. By adding optional communication modules, the device can be connected to BACnet, LonTalk, CAN, PROFINET, Profibus or other communication networks.

For all installations, the local and international rules and standards have to be followed.

☑ Models

F 7793 50 HERZ- Microprocessor Controller XF-5000 with power supply 230 V AC

Technical data

Power supply	230V AC +/- 10%, 50 Hz
Power consumption	max. 15 W
Output load	max. 0.5 A / 250 V
Display	graphical 128 x 64 pixel, monochrome
Protection class	IP 40
EMC certificates	EN 61000-6-2 2008, EN 61000-6-3 2008, EN 61000-6-4 2008
Working temperature	0 - 50 °C
Working humidity	max. 75% rH
Weight	0,5 kg
Installation	DIN rail 35 mm

Connections

4 analogue inputs	0/4 - 20 mA
4 analogue inputs	0/2 - 10 V
5 analogue inputs	Pt1000
8 digital inputs	24 V DC, optically isolated
4 analogue outputs	0 - 10 V
8 digital outputs	4 relays and 4 SSR
MBUS master communication port	
RS232/RS485 communication port	
Ethernet communication port	
USB communication port	
EXT connector for connection with modules	

The microcontroller HERZ gives a possibility to connect sensors type PT 1000 directly, without additional modules. If there is a need to connect NTC sensor, additional modules (e.g. F 7793 34) with NTC inputs have to be used.

Configuration software

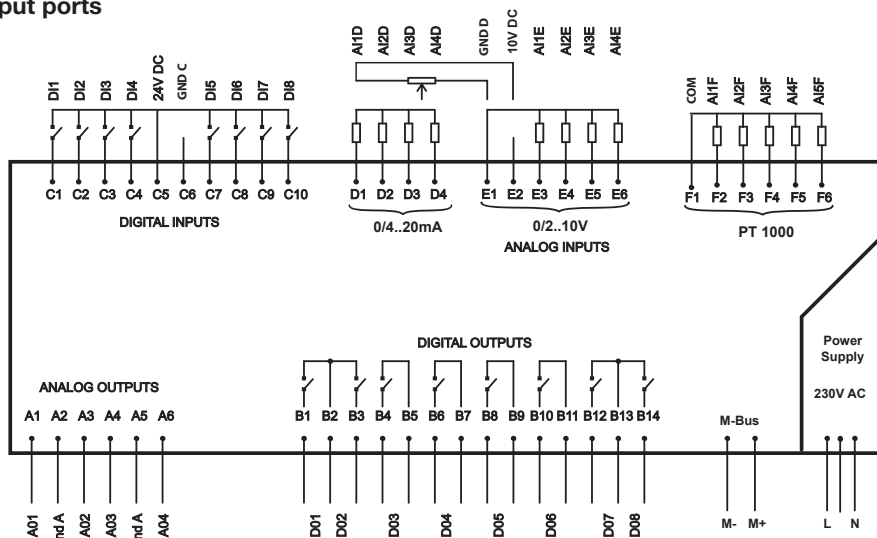
Software programming tools can be installed on the standard PC configuration without any additional demands. User-friendly graphic editor enables users to design applications by dragging and dropping software objects, linking them and setting their parameters.

Software objects, available to the user while designing applications for the controller, are divided into the following libraries:

- input-output objects
- numeric objects
- logic objects
- time objects
- control objects

Graphic editor is intuitive, user-friendly and time efficient. All software object connections are verified during the design process. The editor is also used for INFO screen creation, assigning the names of the signals displayed on the MENU screens, defining the set-point ranges etc. User designed applications are stored on the PC's hard drive and transferred to the controller via USB interface. After this process the applications can be activated.

Input and output ports

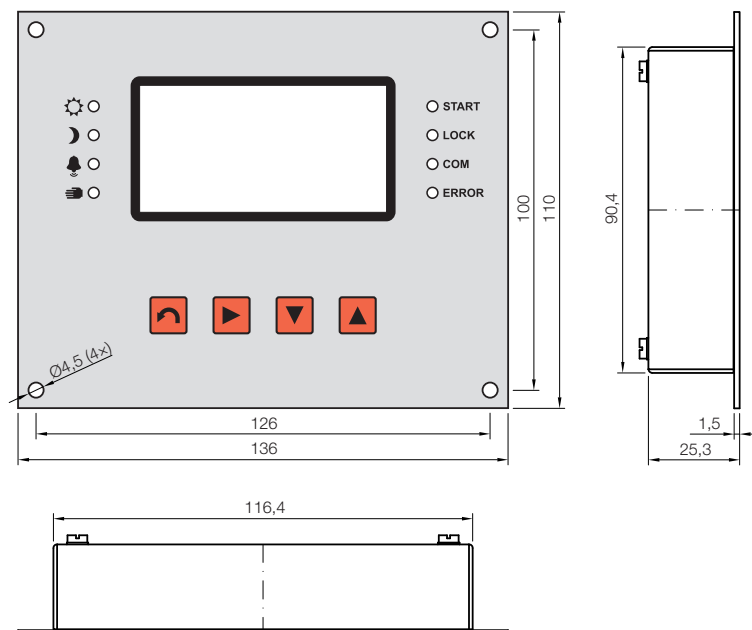


☑ Optional accessories

F 7793 31	Operator console
F 7793 61	Operator panel XF-OP1
F 7793 32	Module XDI with 4 additional digital inputs
F 7793 34	Module XAI 4.1 with 9 additional analogue inputs
F 7793 35	Module XAI 4.2 with 9 additional analogue inputs
F 7793 36	Module XAI 4.3 with 9 additional analogue inputs
F 7793 38	Module XDO with 8 additional digital outputs
F 7793 40	GPRS module for wireless data transfer
F 7793 4x	Pipe temperature sensor PT 1000
F 7793 5x	Duct temperature sensor PT 1000
F 7793 60	Outdoor temperature sensor PT 1000
F 7791 0x	Room temperature sensor PT 1000

☑ Operator panel XF-OP1, F 7793 61 (optional)

Dimensions in mm



Description

The Operator panel XF-OP1 is used as microprocessor controller's external console. It has been designed for installation on a door of an electric cabinet where the microprocessor controller has been installed. The Operator panel is being used as an alternative to regulator's local console, which is attached directly to the regulator and thus can not be used simultaneously. The connection with the controller is established by the 1,5 meter long associated cable which has RJ45 connectors on both ends. The corresponding connection housings (CON connectors) are on the regulator and the operator panel. The Operator panel receives power from the controller so no additional wiring is needed.

On the operator panel a 3,2" monochromatic graphic display with 128 x 64 pixels resolution, 4 push buttons with same functions as on the local console (view of the INFO and MENU screens) and 8 LED lights for signalisation and alarm statuses are installed.

The function of some LED lights depends on the active application of the controller, while others have predefined purposes. LED "LOCK" is on while the changing of the values for regulation, communication and manual handling is disabled, and is off when the user password that enables those functions is entered. LED "COM" is on at moments when data is transferred through the regulator's COM communication connector, which is intended for the connection for remote monitoring and control systems. LED lights "ALARM" and "ERROR" are in red colour while others are in green.

The display turns off after 30 seconds since the last button has been pressed and is turned on again by pressing any of the push buttons.

Technical data

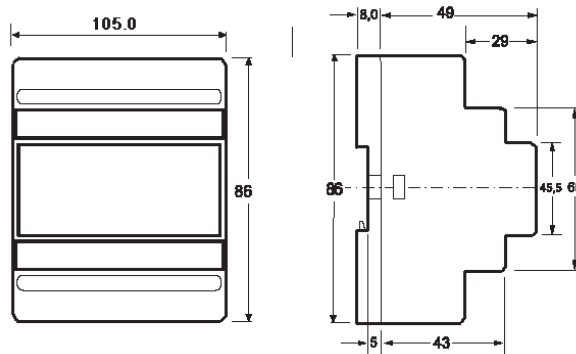
Connection with the controller	RJ54 connector (rear)
Standard cable length	1,5 m
Graphic display	128 x 64 pixels; 3,2"
Surrounding temperature	0 - 55 °C
Surrounding humidity	0 - 75% (without condensation)
Level of protection	IP40
Weight	0,3 kg

Installation

The Operator panel is installed on the front door of the electric cabinet through a open slot and tightened with four M4 screws (which are not included) according to installation measurements.

☑ Digital input module XDI, F 7793 32 (optional)

Dimensions in mm



Description

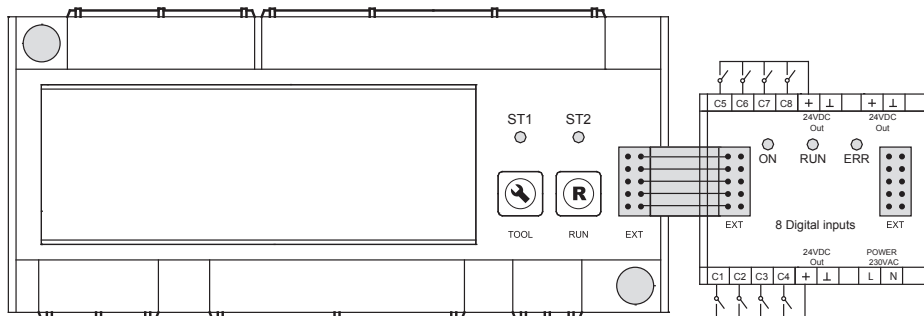
Digital input module XDI is designed to accept digital signals in automated systems, air conditioning, heating, cooling and the process industry. It is used as a module to increase the number of digital inputs of the microprocessor controller and therefore can't be used independently.

The module can accept 8 digital inputs. It is possible to connect up to max. 3 modules to the microprocessor controller. On the front panel there are three LED indicators "ON" (presence of voltage), "RUN" (normal operation), "ERR" (module fault) and "EXT" connector (the connection to the controller and other module expansions).

Technical data

Power supply	230V/AC $\pm 10\%$
Connection with controller	EXT cable connector
Discrete input	24 V / DC
Max. input power	5 mA
Galvanic isolation of inputs	5,0 kV
Number of inputs	8
Working temperature	0 - 50 °C
Enclosure dimensions	EN50022 (105 x 86 x 57mm)
Housing material	Lexan 940, Noryl VO1550

Mounting and connection with controller

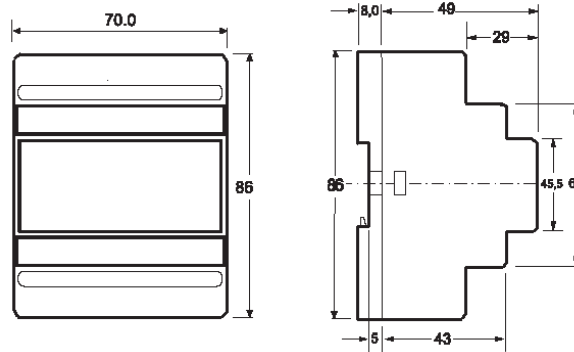


The digital input module is installed on 35mm DIN rail to the built in measures.

All modules are mounted next to another and in close proximity of the microprocessor regulator to the order given in the user's guide.

☑ **Analogue input module XAI, F 7793 34 - 36 (optional)**

Dimensions in mm



Description

The analogue input module XAI is designed to accept analog signals in automated systems, air conditioning, heating, cooling and the process industry. It is used as a module to increase the number of analogue inputs of the microprocessor controller and therefore can't be used independently.

The module can accept analogue input signals from PT 1000, NTC, current and voltage transmitter depending on the type of the analogue input modul.

Only one module can be connected to the microprocessor controller. On the front panel there are three LED indicators "ON" (the presence of voltage), "RUN" (normal operation), "ERR" (module fault) and an "EXT" connector (the connection to the controller and other module expansions).

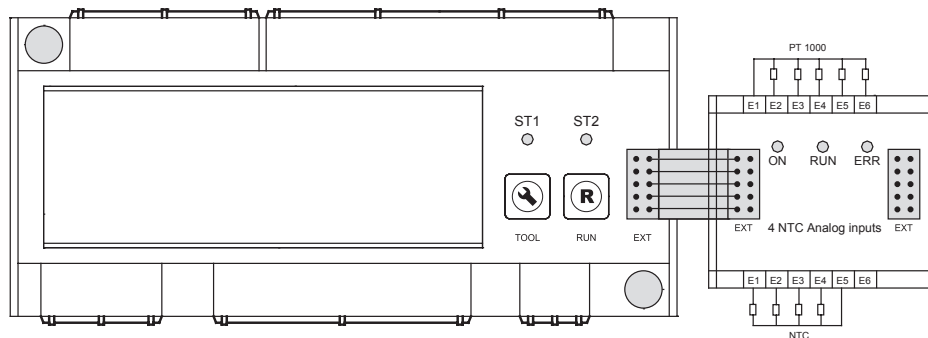
Type overview

F 7793 34 (XAI 4.1)	5 PT 1000 inputs, 4 NTC inputs
F 7793 35 (XAI 4.2)	5 PT 1000 inputs, 4 inputs 0/4 - 20 mA
F 7793 36 (XAI 4.3)	5 PT 1000 inputs, 4 inputs 0/2 - 10 V

Technical data

Power supply	5 V / DC from microprocessor controller
Connection with controller	EXT cable connector
Input type	NTC (2200 Ohm at 25 °C), PT 1000, 0/2 - 10 V, 0/4 - 20 mA
Sample resolution	12 bit
Number of inputs	9
Working temperature	0 - 50 °C
Enclosure dimensions	EN50022 (70 x 86 x 57mm)
Housing material	Lexan 940, Noryl VO1550

Mounting and connection with controller

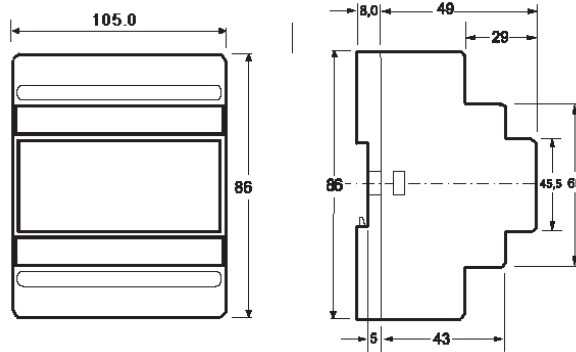


The analogue input module is installed on 35mm DIN rail to the built in measures.

All modules are mounted next to another and in close proximity of the microprocessor regulator to the order given in the user's guide.

☑ Digital output module XDO, F 7793 38 (optional)

Dimensions in mm



Description

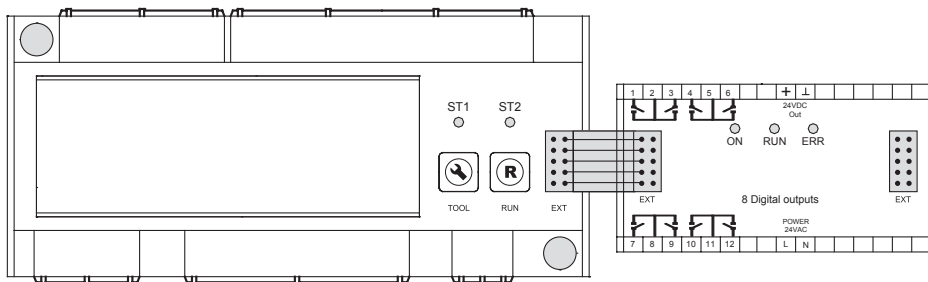
The digital output module XDO is designed to control the work of electric drives 220 V/AC or 24 V/AC directly or through a relay/contactor in automated systems, air conditioning, heating, cooling and the process industry. It is used as a module to increase the number of digital outputs of the microprocessor controller and therefore can't be used independently.

The module has 8 digital relay type outputs. Only one module can be connected to the microprocessor controller. On the front panel there are three LED indicators "ON" (the presence of voltage), "RUN" (normal operation), "ERR" (module fault) and an "EXT" connector (the connection to the controller and other module expansions).

Technical data

Power supply	230V/AC ±10%
Connection with controller	EXT cable connector
Output type	Relay
Output loads	max. 8 A
Galvanic isolation of outputs	5,0 kV
Number of outputs	8
Working temperature	0 - 50 °C
Enclosure dimensions	EN50022 (105 x 86 x 57mm)
Housing material	Lexan 940, Noryl VO1550

Mounting and connection with controller



The digital output module is installed on 35mm DIN rail to the built in measures. All modules are mounted next to another and in close proximity of the microprocessor regulator to the order given in the user's guide.

☑ GPRS module F 7793 40 (optional)

Description

The GPRS modem is applied in Supervisory Control and Data Acquisition systems (SCADA) for data transfer between microprocessor controllers or PLC and supervisory working stations, using public GSM mobile network. It is an industrial communication device for serial data transfer in peer-to-peer or star configurations.

GPRS service is available on the whole territory covered by GSM network of any GSM service provider. The system is protected from unauthorized access by using private APN (Access Point Name) and generates low costs, because the data traffic is monitored based on the amount of transferred data instead of the connection time.

This device could be configured to work in master or slave mode. As a master modem the module establishes a connection with slave modems using a dynamic IP route selection from memorized route tables, while slave modems have a fixed route of the master modem. Whole configuration work is done within any terminal program in modem command mode. Data transfer is done without any control codes.

Four LED diodes ("ON", "GSM", "RDY", "BSY") indicate different device states. All wire connections are configured with plug / unplug connectors. Installation of the device is by standard DIN rail 35mm.

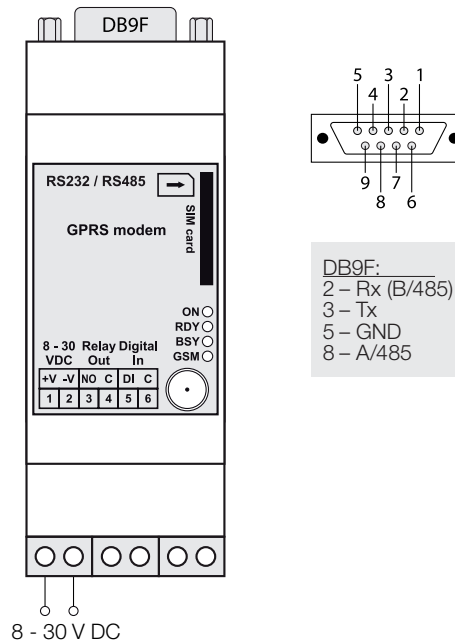
Note:

The GPRS modem has to communicate with fixed IP addresses in VPN GPRS networks. Due to this, it is necessary that the user contacts the local GSM mobile network operator and acquire an appropriate SIM card.

Technical data

Power supply	8 - 30 V / DC
Power consumption	standby 0.2 W, max. 0.3 W
Frequency	900/1800 MHz
Output power	class 4 (2 W at 900 MHz), class 1 (1 W at 1800 MHz)
Antenna	50 Ω, SMA connector
Connectors	plug in connector with 5 mm grid
Communication interface	RS458 / RS232 (DCE configuration), DB9F
Digital input / output	1 / 1
Working temperature	0 - 55 °C
Working humidity	0 - 75% (without condensation)
Level of protection	IP40
Enclosure dimensions	33 x 85 x 58 mm (without clamps and connections)

Mounting and connection

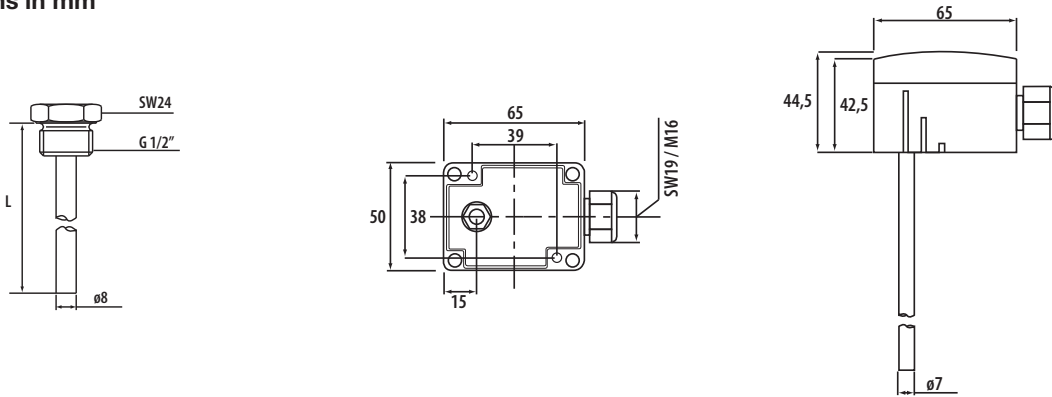


The GPRS module is installed on 35mm DIN rail to the built in measures.

All modules are mounted next to another and in close proximity of the microprocessor regulator to the order given in the user's guide.

☑ Pipe temperature sensor F 7793 4x (optional)

Dimensions in mm



Type overview

Order Nr.	Tube length L
F 7793 41	120 mm
F 7793 42	225 mm
F 7793 43	300 mm
F 7793 44	375 mm

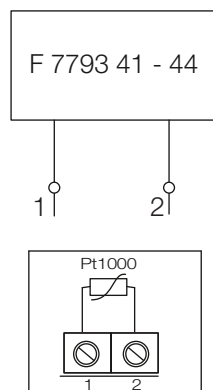
Description

The pipe temperature sensor is used for measuring the temperature of fluids in pipes, containers etc.

Technical data

Sensor element	Pt1000
Measuring range	-50 °C ... +160 °C
Nominal pressure	PN 16
Level of protection	IP65 (according to EN 60529)
Connection	G 1/2"
Housing material	PA6, pure white RAL 9010
Tube material	Nickel-plated brass
Cable inlet	Pg 11
Power supply	5 V / DC
Accuracy	±(0.15 - 0.2%)

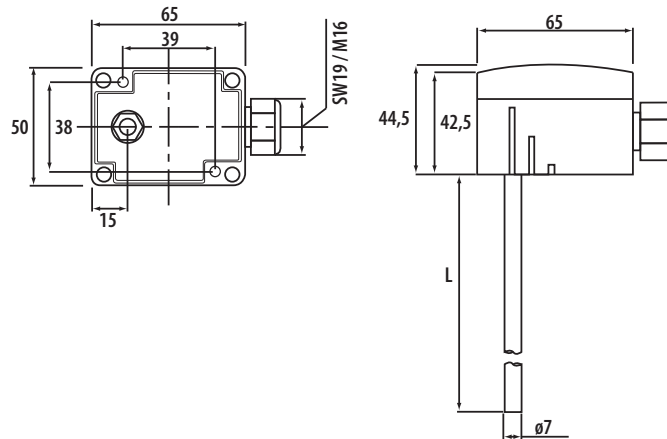
Wiring diagram and mounting instructions



The pipe temperature sensor is mounted in pipes or containers. It should be installed in the pipe against the flow direction. The pipe joint should be sealed with teflon sealing material. In the case of a horizontal installation, the cable connection must be faced down. If the sensor has already been mounted, than the sensing element can be replaced without removing the whole sensor. Connection terminals are for wires up to 1.5 mm² according to the wiring diagram through Pg 11 cable screw fittings. The maximum wire length is 100 m.

☑ Duct temperature sensor F 7793 5x (optional)

Dimensions in mm



Type overview

Order Nr.	Tube lenght L
F 7793 51	240 mm
F 7793 52	392 mm

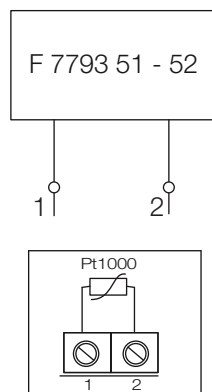
Description

The duct temperature sensor is used for temperature measuring of air inducts for heating, ventilation and air conditioning plants.

Technical data

Sensor element	Pt1000
Measuring range	-50 °C ... +160 °C
Level of protection	IP65 (according to EN 60529)
Housing material	PA6, pure white RAL 9010
Tube material	Stainless steel 1.4571
Cable inlet	Pg 11
Power supply	5 V / DC

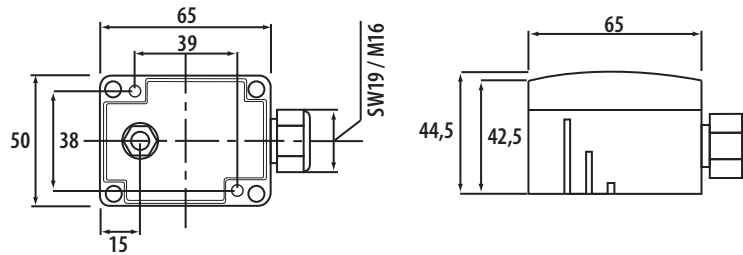
Wiring diagram and mounting instructions



The duct temperature sensor should be mounted in the middle of the air duct. The duct flange is installed on the air ducts with two screws through $\varnothing 3,2$ mm holes on the flange. In case of horizontal installation, the cable connection must be faced down. If the sensor has already been mounted, than the sensing element can be replaced without removing the whole sensor. Connection terminals are for wires up to 1.5 mm² according to the wiring diagram through Pg 11 cable screw fittings. The maximum wire length is 100 m.

Outdoor temperature sensor F 7793 60 (optional)

Dimensions in mm



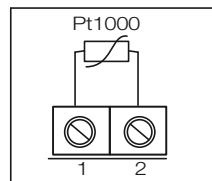
Description

The outside temperature sensor is used for measuring the outdoor temperature in e.g. weather-compensated heating, ventilation and air conditioning systems.

Technical data

Sensor element	Pt1000
Measuring range	-50 °C ... +90 °C
Level of protection	IP65 (according to EN 60529)
Housing material	PA6, Pure white RAL 9010

Wiring diagram and mounting instructions



The outside temperature sensor is installed on an outdoor wall with two screws through the $\varnothing 4.5$ mm holes on the housing bottom side. Connection terminals are for wires up to 1.5 mm² according to the wiring diagram through Pg 11 cable screw fittings. The maximum wire length is 100 m. The Sensor should not be exposed directly to sunlight and should not be installed above windows, ventilation outlets or other heat sources at minimum 2.5m above land surface.

☑ Room temperature sensor F 7791 0x (optional)

Description

The room temperature sensor with a potentiometer is used for measuring and setting of the room air temperature or for both separately, depending on the type. The knob on the front allows the change of a room temperature in a given range. A 10 k Ω potentiometer is used as an element for setting and adjusting the temperature.

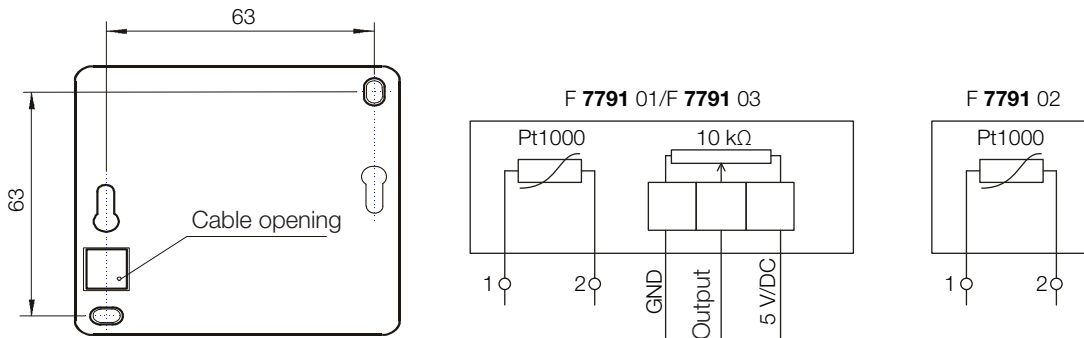
Type overview

F 7791 01	Sensor for measuring and adjusting of the room temperature
F 7791 02	Sensor only for measuring of the room temperature
F 7791 03	Sensor only for adjusting of the room temperature

Technical data

Sensing element	Pt1000
Measuring range	-20 °C ... +60 °C
Setting range	10 °C ... +30 °C
Setting element	Potentiometer
Potentiometer nominal resistance value	10 k Ω
Level of protection	IP50 (according to EN 60529)
Housing material	ABS - white

Wiring diagram and mounting instructions



The housing base is installed by using two $\varnothing 4$ mm screws through the holes on the back of the housing. Sensor connection cable PP00 2 x 0,75 mm² and PPY 3 x 0,75 mm² of the potentiometer, are placed inside the housing through the cable opening and are connected according to the electrical connection scheme. The room temperature sensor should be mounted away from direct heat sources. The maximum allowed cable length is 100 meters.

Please note: all schemes are indicative in nature and do not claim to be complete.

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