TFC Group

Fifty Years of Excellence

1974- 2024 | Heating and Electrical Control Solutions

Optimum WiFi Products

CONNECT is the OPTIMUM range of WiFi Time Switches. These products are remotely programmable via the user's home WiFi hub and a Smartphone app. Via the app they can be programmed for a timed switching sequence on a 24 hour or 7 day basis. They control a volt free switch with a resistive rating of 16 ampere (single channel devices). There is a manual override button on all devices, and they can be manually overridden via the app, whether the user is in WiFi range, or remotely if the smartphone has a data signal.

Additional WiFi switches can be added to the system - a standard WiFi router has capacity for up to 15 devices.

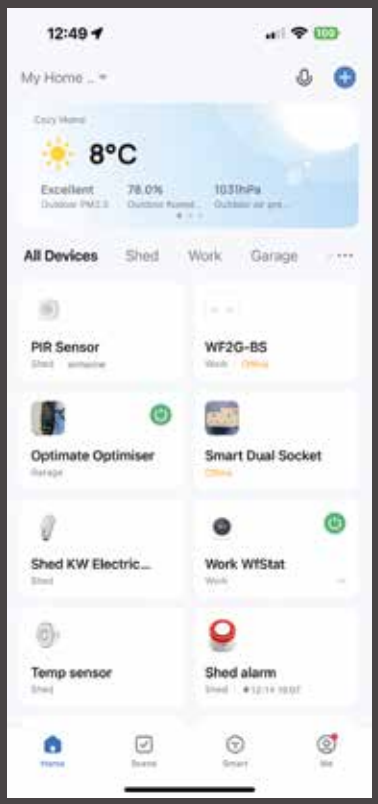
Devices are also compatible with Amazon Alexa & Google Home. Security is military grade A.E.S. Encryption, with dynamic key allocation and an HTTPS encrypted channel.

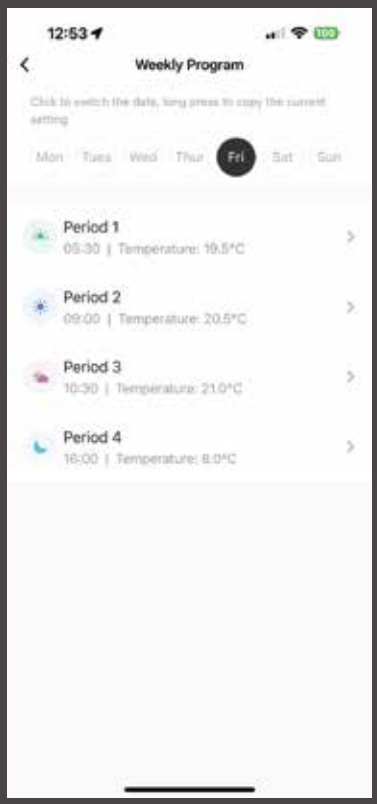
24/7 Worldwide Operation

NO Gateway Required

Vibe² WiFi Programmable Thermostat - Class IV Control

Product Code OP-WFSTAT - See Page 55





Home Heating

Home Appliances

Water Heating

Lighting

WiFi Socket Box Time Switch
Product Code OP-SBWF01
See Page 47

WiFi 2 Channel Time Switch
Product Code OP-SBWF02
See Page 47

WiFi 3 Channel Time Switch
Product Code OP-SBWF03
See Page 47

WiFi Universal Boiler Module
Product Code OP-BM/IHTWF01
See Page 49

WiFi DIN-Rail Timeswitch
Product Code OP-DRWF01
See Page 53

Single Advanced Smart Plug
Product Code OP-WFUSB
See Page 54

Product Highlights from **TFC Group**

Cert No: RS 30178

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Digital Fused Spur Timer
Product Code OP-DFST

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One Button Boost Timer
Product Code OP-EBT2

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Energy Saving
Circulation Pump E.E.I ≤ 0.20
Product Code APUMPHE

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Magnetic Filter
Product Code TRADE03

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Wirerite - 16 way junction box
Product Code WIR16JB

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2 x Corner Radiator Valves
Product Code MRVC

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Vibe RF ProgrammableThermostat Class IV Control
Product Code OP-TPISTAT

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TRV with Lockshield
Product Code TRV4PACK-B

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TFC Group

Heating and Electrical Control Solutions

This year TFC celebrates our 50th year

"An anniversary is a celebration of passion, hard work, and the extraordinary individuals who have contributed to our shared success."

"As we celebrate our anniversary, let's remember that the secret to our success lies not just in our products, but in the passion and dedication of our team."

"An anniversary is not just a milestone; it's a testament to the enduring values, principles, and culture that define who we are as a company."

"An anniversary is a celebration of milestones, achievements, and the incredible individuals who have made our company what it is today."

Our purpose is to deliver excellence!

The year was 1974, and our founder Mike Grice an entrepreneur, financed by Geoffrey Granter of United House and the original Harp Heating. The first products were supplied by Ocean who granted an exclusive agreement to distribute in the UK. Mike, later sold the business to Mike Bradford a well-known name in the controls industry. Mike having worked for many years for Honeywell realised that as times were getting more difficult, there was a need for a supplier that could provide great service, good quality products available in lower volumes, better prices and a fast response.

So, since it was the 1980's and everything seemed possible at the time, Mike decided to start to offer this kind of service and products with the financial help of Dieter Grasslin!

The original idea was to create a complete range of heating controls that offered the absolute best selection of price and quality available. Over the years the company and product range has evolved but never have we lost focus on the need to provide high service and quality to our customer.

In April of 2017, we announced our plans to launch the Optimum range of controls. Why did we do that? With a faster moving industry and legislation changing at a steady pace, we needed to be in a much stronger position to bring new innovative product that meets these new demands into the market place more quickly, and our separation from the old German company allowed this to happen.

In April 2024 the business was acquired by Primaflow Ltd, regardless of our structure or where we've manufactured, our goal has always been and will always be to make TFC the best place for customer service.

What We Live By

At TFC we have 10 Core Values that are more than just words, they're a way of life. We know that companies with a strong culture and a higher purpose perform better in the long run. As we continue to grow, we strive to ensure that our culture remains alive and well. Check out our core values and see if they speak to you.

Our 10 Core Values

The Tower brand is synonymous within the heating industry for 5 decades. Originally known as Tower Flue Components, as a major supplier and today we believe the only UK based manufacturer of terminal flue guards. The product range has developed over the years to encompass an in-depth offering of heating and electrical control products.

The brand is well recognised for supplying a good value for money range of products and services. Tower is well known also as an OEM supplier of these products for the Independent wholesale and merchant markets.

The national merchants have always had the purchasing power to demand an own brand range, however with lower volumes it was prohibitive for some of the smaller independents. Tower, took the decision some 10 years ago to offer this bespoke service to independent customers who were looking to add value, margin and protection from the internet, with the help of Tower they have been successful in achieving this.

Tower hope that this kind of focus and opportunity will continue to keep us at the fore-front of the independents mind.

Central Heating Programmers

Room Thermostats

Motorised Valves

Actuators

Valves & Motors

Fire Valves

Air Separators

Central Heating Chemicals

Filters

Scale Inhibitors

Compliance Packs

Thermostatic Radiator Valves

Circulating Pumps

Safety Guards

Junction Boxes

Multi Core Flex

Room Thermostat

Product Code STTRSL

The Tower STTRSL is a dial-type mechanical room thermostat for regulation of room temperature, and includes a useful neon indicator to show when the heating is ON. With neutral housing to blend in to any style of decor.

Designed for wall mounting, with 60mm fixing centres for back-box compatibility, and suitable for in-wall or surface run wiring connection. The thermostat cover incorporates four breakouts for surface-run conduit. The temperature regulation mechanism is the well-proven sealed bellows system.

- 10 (3) A @ 230 VAC µ
- Volt-free contact
- For mains or low voltage applications (Lamp will not function on low voltages)
- Range: 10°C to 30°C
- For wall mounting
- In-wall or surface-run wiring

Combi Room Thermostat
Product Code STTRS1

Specifications

- Raised dial for ease of use
- Temperature control Range: +10°C to +30°C
- Switch contacts SPDT, Volt free
- Switch rating: 10A (3A) at 230V AC
- Switch differential: 0.5°C
- Ambient temperature 40°C maximum
- Class II insulation • 2 wire connection
- Suitable for heating or cooling system
- Suitable for combination boilers • Class 1

Frost Thermostat
Product Code STTRFSN

- Raised dial for ease of use
- Temperature control Range: -5°C to +15°C
- Switch contacts SPDT, Volt Free
- Switch rating: 10A (3A) at 230V AC
- Switch differential: 0.5°C
- Ambient temperature 40°C maximum
- Class II insulation
- 2 wire connection
- Suitable for heating or cooling systems
- Class 1

Tamper-proof Thermostat
Product Code STTPRS

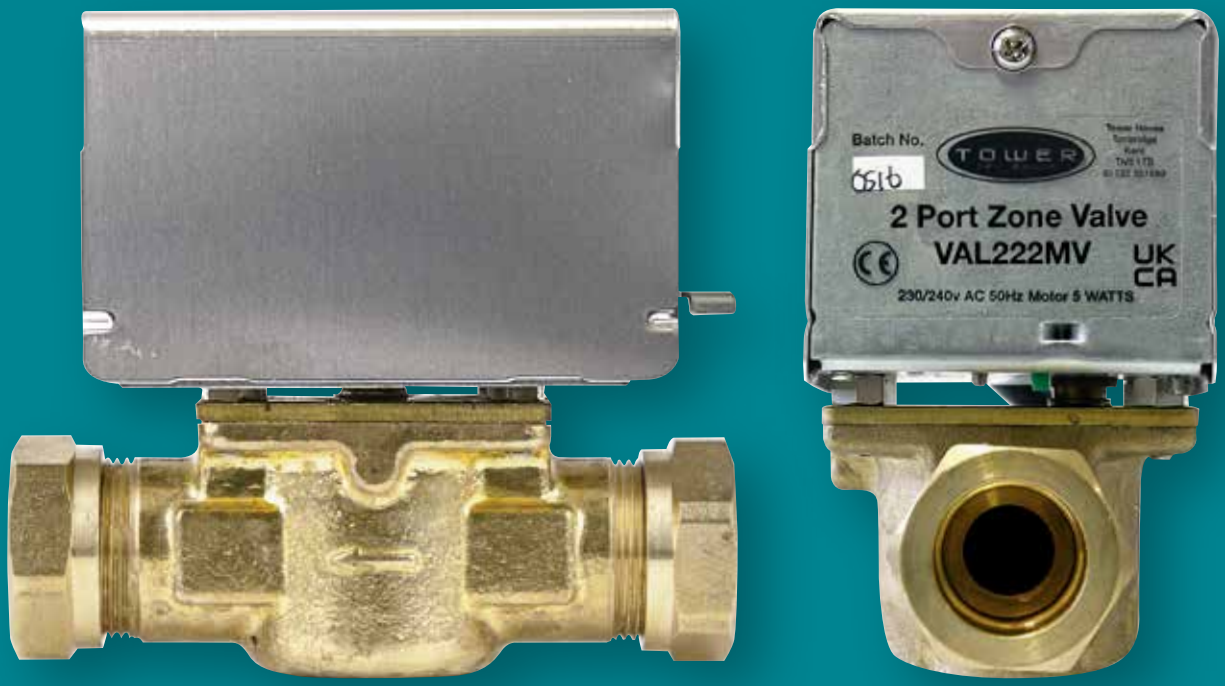
- 10 (3) A @ 230 VAC µ
- Volt-free contact
- For mains or low voltage applications
- Range: 10°C to 30°C
- For wall mounting
- In-wall or surface-run wiring
- Tamper proof cover

Pipe & Cylinder Thermostat
Product Code PCS

- Designed to mount on water pipes and hot water cylinders
- Range: +10°C to +90°C
- Rating: 16 (4) Amps at 250V AC
- Switch type: Single pole / double throw
- Differential: 5°C
- IP40 protected

22mm 2 Port Motorised Zone Valve

Product Code VAL222MV



The VAL222MV is a 2 port spring return zone valves with 22mm compression fittings and an auxiliary switch. This is for general purpose flow control applications or central heating systems. When correctly wired with an appropriate room thermostat, cylinder thermostat and programmer the valve will control the water flow from the boiler to hot water and from boiler to central heating.

- Two port 22mm
- Switch rating: 3 Amp
- Supply voltage: 240V AC
- Brass geared synchron motor
- Industry standard cable colours
- Manual open for commissioning
- 4rpm for greater control
- Honeywell equivalent: V4043

28mm 2 Port Motorised Zone Valve

Product Code VAL228MV

Specifications

- Two port 28mm
- Switch rating: 3 Amp
- Supply voltage: 240V AC
- Brass geared synchron motor
- Industry standard cable colours
- Manual open for commissioning
- 4rpm for greater control
- Honeywell equivalent: V4043

22mm Motorised Mid Position Valve

Product Code VAL322MP

- 3 Port Mid-Position 22mm
- Switch rating: 3 Amp
- Supply voltage: 230V AC
- Brass geared synchron motor
- Industry standard cable colours
- Manual open for commissioning
- 4rpm for greater control
- Honeywell equivalent - V4073A

28mm Motorised Mid Position Valve

Product Code VAL328MP

- 3 Port Mid-Position 28mm
- Switch rating: 3 Amp
- Supply voltage: 230V AC
- Brass geared synchron motor
- Industry standard cable colours
- Manual open for commissioning
- 4rpm for greater control
- Honeywell equivalent - V4073A

2 Port Zone Valve & Mid Position Actuators

Product Codes A2PORT & A3MID

- Replacement valve actuator
- Can be fitted without draining the system
- Fits 22mm & 28mm valve body
- Brass geared synchron motor
- Suitable for replacement on Honeywell body
- A2PORT: 4rpm for greater control
- A3MID: 4rpm for greater control

22mm Automatic Bypass Valves

Angled

Product Code ABBV1

Straight

Product Code ABBV1ST

The Tower auto bypass valve (ABBV1) should be fitted where a boiler bypass is required – typically this is the case when a system is equipped with thermostatic radiator valves (TRV's), and to allow pump overrun operation after zone valves have closed down.

TRV's slowly close down as each radiator raises the room temperature. To overcome flow restriction as TRV's close down, the ABBV1 is adjusted to the required set point. As the system resistance increases due to TRV's closing, the ABBV1 allows flow to increase, in order to maintain the required pre-set system differential pressure. The regulation provided will reduce system noise that can result from TRV's or zone valves closing, eliminate pump impeller wear that can result from high flow resistance, and enhance the life of the boiler's heat exchanger by ensuring minimum flow rate at all times.

- Regulates heating system differential pressure
- High capacity flow, up to 50 litres per minute
- Differential pressure range: 0.1 to 0.6 bar
- 22mm compression fittings
- Reduces system noise
- Lockable set pressure
- Constant flow through boiler
- Equivalent to Honeywell DU144 & DU145
- 110°C max working temperature

Synchronous Valve Motor

Product Code SYNABOXED

Specifications

- Universal synchronous motor
- 6W, 4rpm, 230V AC
- Fits ACL, Drayton, Honeywell, Tower, Landis & Steafa,
- Satchwell
- Brass geared motor

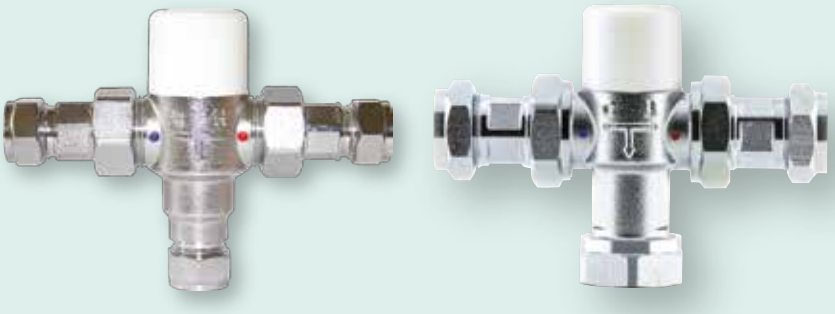
22mm Pressure Reducing Valve

Product Code PRVG

- Diameter - 22mm
- Max Flow Temperature - 80°C
- Max Inlet working pressure - 16 bar
- Pressure Setting - Min 1 bar / Max 6 bar
- Pressure Gauge Reading - 0-10bar/140psi
- Pressure Gauge Connection - 1/4"BSP
- Includes 15mm Reducer Kit
- WRAS Approved

15mm & 22mm Mixing Valves

Product Codes TMV & TMV22MM



- Designed to blend the hot and cold water supplies to a maximum set temperature
- Chrome plated with compression fittings
- Removable 600um (0.6mm) filters and single non-return valves on inlets
- Outlet temperature: +35°C to 50°C • Accuracy: +/- 2°C
- Maximum hot temperature: 85°C
- Supply temperature Hot: 52-62°C
- Supply temperature Cold: 5-20°C
- Minimum supply pressure: 0.2 bar dynamic
- Maximum supply pressure: 10 bar static, 5 bar dynamic
- Maximum dynamic pressure: 2 bar (between hot & cold)

Bypass Valve

Product Code BPV

- Adjust working pressure: 0.1- 0.5 bar
- Working temperature range: 0-95 °C
- Product size: 22mm Compression
- Finish: Nickel plated

Hot Water Expansion Vessels

Product Codes EV8, EV12, EV19, & EV24

8 Litre Expansion Vessel
Product Code EV8
Diameter: 200mm, Height: 340mm

12 Litre Expansion Vessel
Product Code EV12
Diameter: 270mm, Height: 340mm

19 Litre Expansion Vessel
Product Code EV19
Diameter: 270mm, Height: 410mm

24 Litre Expansion Vessel
Product Code EV24
Diameter: 270mm, Height: 460mm

Brackets
Code EVBR8
Bracket fits EV8

EVBR12-24
Bracket fits
EV12, EV19 & EV24

- Material: Steel
- Connection: 1-inch
- Working Pressure: 10 Bar
- Temperature Range: -10 to 99°C

Experience the power of efficient heating with our hot water expansion vessels, tailored for your closed-water heating system. These vessels ensure constant pressure and stability, managing the expansion and contraction of water as it heats and cools. Equipped with a dual-chamber design that accommodates both air and water, they serve as an overflow tank for additional hot water, effectively normalizing system pressure. Opt for our Tower hot water expansion vessels and elevate your heating system's performance and reliability.

Selection and Sizing:
The correct sizing and selection of expansion vessels are crucial for optimal system performance. Incorrect specifications can lead to frequent pump failures and other system malfunctions. For precise sizing and additional technical guidance, we recommend consulting with a qualified heating engineer or professional to ensure the best fit and performance.

- Crucial Component: Essential for maintaining constant pressure within your heating system.
- Shock Absorber: Manages water expansion and contraction efficiently as temperatures change.
- Dual Chamber Design: Simultaneously accommodates air and water, enhancing pressure management.
- Overflow Tank: Provides additional hot water capacity, helping to stabilize system pressure.
- System Stability: Acts as a buffer against pressure fluctuations, maintaining system integrity.
- Adaptable Design: Engineered to integrate seamlessly with both modern and traditional heating systems.
- Efficient Performance: Capably manages water expansion, which can vary between four and nine percent.
- Reliable Operation: Delivers dependable performance, even in compact vessel configurations.
- Nitrogen Pre-charged Vessel: Each vessel is pre-charged with nitrogen to optimize the maintenance of pressure over time.

22mm / 28mm Air Separator

Product Code AIR22 / AIR28

Specifications

- Available in 22mm or 28mm
- Reduces noise in the system
- Widely specified and used by BRITISH GAS
- Reduces pump failure
- Easy to install
- Automatically and progressively eliminate air from the system
- Solder connections

Air Separator with Cold Feed

Product Code AIR22CF

- Available in 22mm
- Cold feed
- Reduces noise in the system
- Widely specified and used by BRITISH GAS
- Reduces pump failure
- Easy to install
- Automatically and progressively eliminate air from the system
- Solder connections

Shock Arrestor

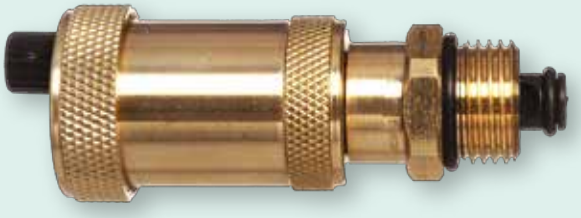
Product Code SA1/2

- Capacity: 0.16 litres
- Vessel pre-charge: 3 to 3.5 bar
- Max. Operating Pressure: 10 bar
- Connection: BSP Parallel thread
- Size: 1/2"
- Diameter: 78 mm
- Height: 110 mm
- Potable: Yes

WRAS APPROVED PRODUCT

Auto Air Vent

Product Code AAV



- Max. Working pressure: 10 bar
- Working temperature range: 0-95 °C
- Product size: 1/2" BSP
- Finish: Brass

500ml NSF System Inhibitor

Product Code TRIPCON1

- Prevents scale, corrosion, hydrogen gassing, boiler noise and micro-biological growth
- For best results the system should be flushed with Tower Cleanser prior to adding Inhibitor
- For open vented systems fill via header tank
- For sealed systems fill via a radiator
- 500ml is sufficient for treating 100 litres of water (a typical domestic system of up to 10 radiators)

NSF CIAS

NSF is recommended by all major boiler manufacturers.

500ml System Cleanser
Product Code TRIPCON2

Specifications

- Used for commissioning new systems or as a sludge remover for existing systems, including those containing aluminium
- For open vented systems fill via header tank
- For sealed systems fill via a radiator
- 500ml is sufficient for treating 100 litres of water (a typical domestic system of up to 10 radiators)

500ml System Descaler & Silencer
Product Code TRIPCON4

- Designed to reduce boiler noise in central heating systems caused by limescale deposits on the boiler heat exchange
- Suitable for all types of systems including those containing aluminium
- For open vented systems fill via header tank
- For sealed systems fill via a radiator
- 500ml is sufficient for treating 100 litres of water (a typical domestic system of up to 10 radiators)

500ml System Leak Sealer
Product Code TRIPCON5

- Designed to seal inaccessible leaks and weeping joints
- Reduces pressure loss in sealed systems
- Does not cause blockages in circulator pumps or air vents
- Can eliminate damp patches under screed (avoiding costly repairs)
- Effective within 1 to 24 hours of normal operation when a soft seal will form
- 500ml is sufficient for treating 100 litres of water (a typical domestic system of up to 10 radiators)

500ml Inhibitor
Product Code TT01

- Prevents bacterial contamination in domestic heating systems
- For open vented systems fill via header tank
- 500ml is sufficient for treating 100 litres of water (a typical domestic system is up to 10 radiators)

500ml Cleanser
Product Code TT02

- Used for commissioning new systems or as a sludge remover for existing systems, including those containing aluminium
- For open vented systems fill via header tank
- For sealed systems fill via a radiator
- 500ml is sufficient for treating 100 litres of water (a typical domestic system of up to 10 radiators)

Energy Saving High Efficiency Circulation Pump

Product Code APUMPHE

The APUMPHE is equipped with permanent-magnet motor and differential pressure controller, capable of automatically and continuously adjusting motor performance to meet the actual needs of the system. When the pump is working, the pump is controlled according to the principle of "Proportional Pressure Control (BL)" or "Constant Pressure Control (HD)." In these two control modes, the pump performance and corresponding power consumption will be regulated according to the heat demand of the system.

Easy installation and start-up
Provided with self-adaptive mode AUTO (Initial setting). In most cases, the motor pump needs no adjustment and can be readily started and automatically adjusted to meet the actual needs of the systems.

- E.E.I ≤ 0.20
- ERP Compliant
- Easy installation and start-up
- Low energy consumption
- Suitable for domestic heating systems
- Proportional Pressure Control setting
- Constant Pressure Control setting

Dimensions: Height 130mm x Width 130mm x Depth 130mm

Energy Saving High Efficiency Bronze Bodied Pump

Product Code BRZPUMPHE

The BRZPUMPHE is equipped with permanent-magnet motor and differential pressure controller, capable of automatcally and continuously adjusting motor performance to meet the actual needs of the hot water system. When the pump is working, the pump is controlled according to the principle of “Proportional Pressure Control (BL)” or “Constant Pressure Control (HD)” In these two control modes, the pump performance and corresponding power consumption will be regulated according to the hot water demand of the system.
Easy installation and start-up

Provided with self-adaptive mode AUTO (Initial setting). In most cases, the motor pump needs no adjustment and can be readily started and automatically adjusted according to the hot water demand of the system.

- E.E.I ≤ 0.20
- ERP Compliant
- Standard 1 1/2" fittings
- Max Head: 6m
- Low-noise
- Maintenance-free
- Strong bronze body
- Max Head: 6m
- Max Power: 45w
- Voltage: 230V
- Joint type: Screw G1
- Frequency: 50Hz. AC power
- Max system pressure= 1.0Mpa
- Certificate: CCC, CE, GS, RoHS, ISO9001: 2000

Dimensions
Height 130mm x Width 130mm x Depth 130mm

Applications:
Air-conditioning system
Industrial and domestic hot water re-circulation system

Commercial Grade Circulation Pump

Product Code TPS25/80

- Powerful 245 watt motor
- High-quality materials for durability and longevity
- Compact design for easy installation in a variety of heating systems
- Compatiblewith a range of pipework configurations
- Efficient and reliable operation at 1.1amps and 230 volts
- Suitable for both domestic and commercial applications
- Simple installation
- Maximum flow rate: 6m³ per hour
- Maximum head rating of 8 metres
- 10 bar maximum operating pressure
- 1 ½ BSP connection
- 230v, 50Hz power voltage supply
- Water Temp: 2°C to 110°C
- Port to port: 180mm
- Faceplate to centre of pipework: 130mm

22mm / 28mm Magnetic Filter

Product Code TRADE03 / TRADE03-28MM

Improved to 12,000 gauss magnetic field

- Removing iron, nickel and cobalt particles in the water
- Providing consistent protection for the boiling system
- Extending longevity of the system
- Saving energy by 6% per annum
- Reducing carbon emission
- Saving maintenance cost
- No extra operating cost
- Easy to install and clean
- Max flow rate: 6.9 M^3/h

- Filter volume: 530ml
- Working pressure: 3 bar
- Maximum pressure: 6 bar
- Max Dynamic Pressure: 1.5 bar
- Maximum temperature: 90°C
- Magnetic field of rod: **12,000 gauss**
- Body: Glass fibre reinforced nylon
- Connection 2 x ball valves - 22mm/28mm compression
- Weight: 1.48Kg

28mm Ball Valve

Product Code TRADE-28mm

28mm compression fitting ball valves for TRADE03 filter

O-Rings

Product Code O-RING

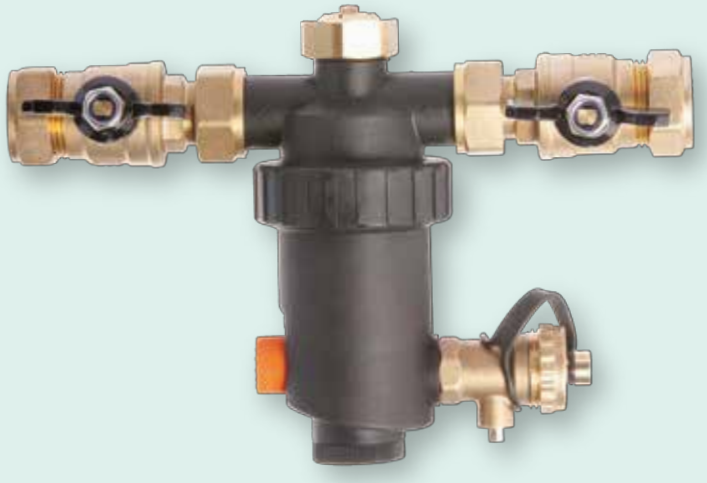
O-ring set for TRADE03 filter (3 per set)

Specifications

- Works as a dual filter to maximise the life expectancy of your boiler whilst maintaining fuel efficiency
- Removes magnetic and non-magnetic particles
- Removes Iron, Nickel and Cobalt particles in the water
- Rare neodymium 10,000 gauss magnet
- Saves energy by up to 6% per annum
- Provides consistent protection for the boiler system
- Extends the lifetime of the system
- Reduces carbon emissions
- Saves maintenance cost

22mm Micro Filter

Product Code MFILT



PACK INCLUDES:

- TRADE03 - 22mm Magnetic Filter
- ILS2 - 15mm Magnetic Inline Scale Inhibitor
- TT01 - 500ml Inhibitor
- TT02 - 500ml Cleanser

Compliance Pack Hard Water

Product Code TRADE04

PACK INCLUDES:

- TRADE03 - 22mm Magnetic Filter
- TT01 - 500ml Inhibitor
- TT02 - 500ml Cleanser

Compliance Pack Soft Water

Product Code TRADE05

Hard Water Protection Pack

Product Code PPHW

Specifications

PACK INCLUDES:

- TRADE03 - 22mm Magnetic Filter
- SA1/2 - Shock Arrestor
- ILS2 - 15mm Magnetic Inline Scale Inhibitor
- TT01 - 500ml Inhibitor
- TT02 - 500ml Cleanser

Soft Water Protection Pack

Product Code PPSW

PACK INCLUDES:

- TRADE03 - 22mm Magnetic Filter
- SA1/2 - Shock Arrestor
- TT01 - 500ml Inhibitor
- TT02 - 500ml Cleanser

Electrolytic Inline Scale Inhibitor

Product Code ILS2

- Maximum working pressure: 10 bar at 20°C
- Service life - up to 10 years
- Saves energy costs
- No chemicals or power needed
- Easily installed
- No moving parts
- No maintanence required
- 15mm compression fittings
- 1 year replacement guarantee

Thermostatic Radiator Valve

Product Code TRV2

Thermostatic valves are typically used for regulating the fluid flow to the radiators of central heating systems. They are provided with a regulating element which automatically controls the opening of the valve to keep the ambient temperature of the room where they are installed constant at the set value.

The number on the valve corresponds to a specific air temperature. Once you have selected a number, the thermostatic valve will maintain this temperature. This prevents unwanted temperature rises and achieves considerable energy savings. The quality is up to the requirement of EN215 and BS7556 standard.

- Angled body
- Fully reversible
- For flow or return
- Vertical or Horizontal head
- Range: +7°C to +28°C
- Easy fit to suit 10-15mm
- Liquid sensor
- Chrome plate body
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure: 10bar
- Supplied with reducers

TRV with Lockshield
Product Code TRVPACK

Specifications

- Angled body
- Supplied with lockshield
- TRV fully reversible
- For flow or return
- Vertical or Horizontal head
- Range: +7°C to +28°C
- Easy fit to suit 10-15mm
- Liquid sensor
- Chrome plate body
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure: 10bar
- Supplied with reducers

TRV with Lockshield
Product Code TRVPACKST

- Straight body
- Supplied with lockshield
- TRV fully reversible
- Flow direction arrow on valve body
- Vertical or Horizontal head
- Range: +7°C to +28°C
- Easy fit to suit 10-15mm
- Liquid sensor
- Chrome plate body
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure: 10bar
- Supplied with reducers

TRV with Drain-off Lockshield
Product Code TRVPACKDO

- Angled body
- Supplied with drain-off lockshield
- TRV Fully reversible
- For flow or return
- Vertical or Horizontal head
- Range: +7°C to +28°C
- Easy fit to suit 10-15mm
- Liquid sensor
- Chrome plate body
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure: 10bar
- Supplied with reducers

Specifications

Chrome TRV with Lockshield

Product Code TRVPACKCH

- Angled body
- Supplied with lockshield
- TRV fully reversible
- For flow or return
- Vertical or Horizontal head
- Range: +7°C to +28°C
- Easy fit to suit 10-15mm
- Liquid sensor
- Chrome plate body
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure: 10bar

ChromeTRV with Lockshield

Product Code TRVPACKSTCH

- Straight body
- Supplied with lockshield
- Flow direction arrow on valve body
- Vertical or Horizontal head
- Range: +7°C to +28°C
- Easy fit to suit 10-15mm
- Liquid sensor
- Chrome plate body
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure: 10bar

TRV4 with Lockshield

Product Code TRV4PACK

- Supplied with lockshield
- Can mount on flow or return
- TRV Fully Reversible
- Vertical or horizontal head
- Range 7°C to 28°C
- Liquid sensor
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure 10 bar

TRV4 with Drain-off Lockshield

Product Code TRV4PACKDO

Specifications

- Supplied with drain-off lockshield
- TRV Fully Reversible
- Vertical or horizontal head
- Range 7°C to 28°C
- Liquid sensor
- Frost protection setting
- Standard 1/2" tail
- Maximum working pressure 10 bar
- Can mount on flow or return

TRV with Lockshield

Product Code TRV4PACKST

- Finish - Chrome
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Flow direction arrow on valve body

Corner TRV with Lockshield

Product Code TRV4PACKC

- Finish - Chrome
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Can mount on flow or return

Specifications

- Finish - Anthracite
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Can mount on flow or return

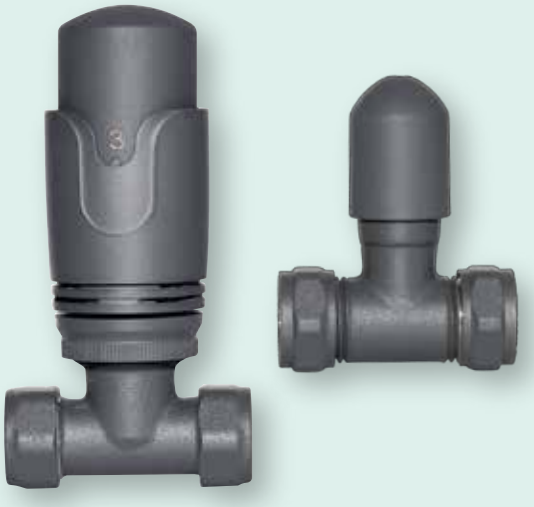
TRV with Lockshield

Product Code TRV4PACKAN

- Finish - Anthracite
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Flow direction arrow on valve body

TRV with Lockshield

Product Code TRV4PACKSTAN



- Finish - Anthracite
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Can mount on flow or return

Corner TRV with Lockshield

Product Code TRV4PACKCAN

TRV with Lockshield

Product Code TRV4PACK-B

TRV with Lockshield

Product Code TRV4PACKST-B

Corner TRV with Lockshield

Product Code TRV4PACKC-B

Specifications

- Finish - Black
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Can mount on flow or return

- Finish - Black
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Flow direction arrow on valve body

- Finish - Black
- Max. Working pressure: - 10 bar
- Max. Flow temperature: - 110°C
- Max. Pressure drop: - 46 Ft. W.G.
- Max Differential pressure: - 1.0 bar
- Temperature Range: - 7°C to 28°C
- Position 3: - 20°C
- Position *: - Frost Protection
- Can mount on flow or return

Specifications

2 x Corner Radiator Valves

Product Code MRVC

- Finish - Hand Polish High Quality Chrome
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

2 x Modern Angled Radiator Valves

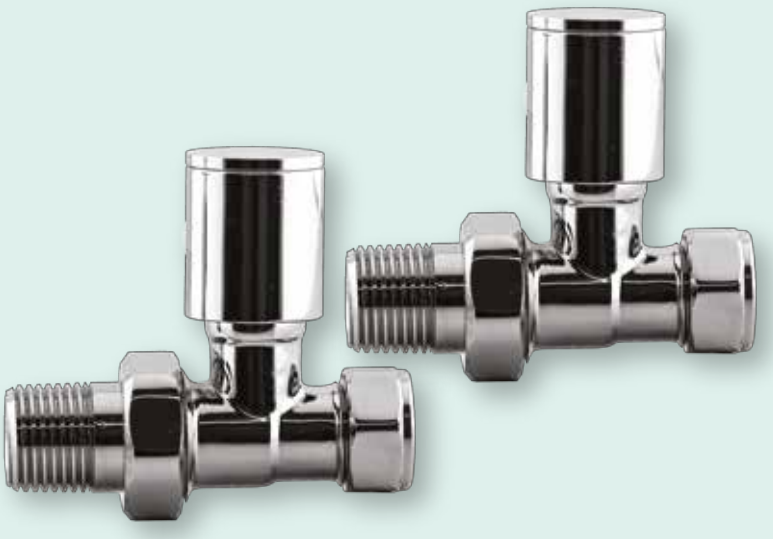
Product Codes MRVM

- Finish - Hand Polish High Quality Chrome
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

2 x Modern Straight Radiator Valves

MRVMST

- Finish - Hand Polish High Quality Chrome
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm



2 x Corner Radiator Valves

Product Code MRVC-A

Specifications

- Finish - Anthracite
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

2 x Modern Angled Radiator Valves

Product Code MRVM-A

- Finish - Anthracite
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

2 x Modern Straight Radiator Valves

Product Code MRVMST-A

- Finish - Anthracite
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

Specifications

2 x Corner Radiator Valves

Product Code MRVC-B

- Finish - Black
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

2 x Modern Angled Radiator Valves

Product Codes MRVM-B

- Finish - Black
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

2 x Modern Straight Radiator Valves

MRVMST-B

- Finish - Black
- Max Flow Temperature - 120°C
- Max Working Pressure - 10bar
- Radiator Connection - 1/2"BSP
- Pipe Work Connection - 15mm

Radiator Lockshield
Product Code LS1

Specifications

- Body can be mounted either vertically or horizontally
- Bi-directional flow
- Can be used with Tower radiator thermostat TRV2
- 15mm compression fittings
- Supplied with 1/2" tailpiece
- Supplied with witches hat for lockshield application
- Robust high quality chrome finish
- Dual function - can be used as lockshield or wheel head

Radiator Drain-off Lockshield
Product Code LS1DO

- Built in drain-off port
- Body can be mounted either vertically or horizontally
- Bi-directional flow
- Can be used with Tower radiator thermostat TRV2
- 15mm compression fittings
- Supplied with 1/2" tailpiece
- Supplied with witches hat for lockshield application
- Robust high quality chrome finish
- Dual function - can be used as lockshield or wheel head

Radiator Lockshield
Product Code LS1ST

- Body can be mounted either vertically or horizontally
- Bi-directional flow
- Can be used with Tower radiator thermostat TRV2
- 15mm compression fittings
- Supplied with 1/2" tailpiece
- Supplied with witches hat for lockshield application
- Robust high quality chrome finish
- Dual function - can be used as lockshield or wheel head

Pipe Shroud & Collar Kits

200mm Black Kit - Code PS200B

300mm Black Kit - Code PS300B

200mm Anthracite Kit - Code PS200A

300mm Anthracite Kit - Code PS300A

200mm Chrome Kit - Code PS200C

300mm Chrome Kit - Code PS300C

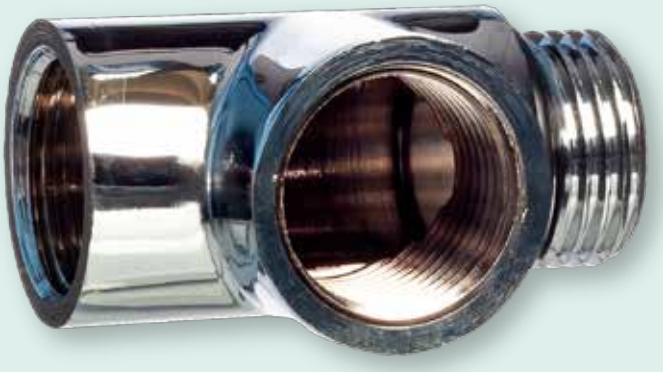
Are you tired of unsightly plumbing ruining the aesthetic of your home? Look no further! Our Plastic Pipe Shrouds and Collars provide the perfect solution to conceal exposed pipework, giving your home a neat and sophisticated appearance. Perfect for new builds or existing homes undergoing refurbishment or extension, our Pipe Covers save you time and money while elevating your décor.

The installation process is incredibly simple, with no need to disassemble your pipework. Just clip the collar onto your pipe, and you're done! There is no mess, no scratches or scuffs.

- Wraps around 15mm pipes
- Product lengths 200mm & 300mm
- Covers unsightly radiator tails and pipework
- Easy to trim and fit
- Collars avoid having to make good around pipework
- Can be fitted to existing pipework
- Pack contains 2 x equal length pipe shrouds & 2 x collars

Towel Rail T-Piece Chrome

Product Code TPC-C



Towel Rail T-Piece Anthracite

Product Code TPC-A

Towel Rail T-Piece Black

Product Code TPC-B

Specifications

- High-Quality Material: Made from durable brass, ensuring long-lasting use.
- Standard Connection: G1/2 connection for compatibility with most installations.
- Durable Coating: Resistant to chipping, scratching, and fading.
- Efficient Design: Allows heating element through straight connections and thermostatic radiator valve (TRV) to the angled connection.
- Aesthetic Appeal: Enhances bathroom decor with polished and sleek designs.
- Supplied with G1/2 threaded blanking plug.

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- Aesthetic Appeal: Enhances bathroom decor with polished and sleek designs.
- Supplied with G1/2 threaded blanking plug.

Specifications

Push Fit Stem Elbow Chrome

Product Code ELB1

- Universal 15 mm x 10 mm 90° push-fit stem elbow
- Fits most makes of thermostatic radiator valve
- Brass with chrome finish
- Compatible with copper & plastic 10mm pipe
- Supplied in pairs

Push Fit Stem Elbow Anthracite

Product Code ELB1-A

- Universal 15 mm x 10 mm 90° push-fit stem elbow
- Fits most makes of thermostatic radiator valve
- Brass with anthracite finish
- Compatible with copper & plastic 10mm pipe
- Supplied as singles

Push Fit Stem Elbow Black

Product Code ELB1-B

- Universal 15 mm x 10 mm 90° push-fit stem elbow
- Fits most makes of thermostatic radiator valve
- Brass with black finish
- Compatible with copper & plastic 10mm pipe
- Supplied as singles

Push Fit Stem Elbow Chrome

Product Code ELB2

Specifications

- Universal 15 mm x 15 mm 90° push-fit stem elbow
- Fits most makes of thermostatic radiator valve
- Brass with chrome finish
- Compatible with copper & plastic 15mm pipe
- Supplied in pairs

Push Fit Stem Elbow Anthracite

Product Code ELB2-A

- Universal 15 mm x 15 mm 90° push-fit stem elbow
- Fits most makes of thermostatic radiator valve
- Brass with anthracite finish
- Compatible with copper & plastic 15mm pipe
- Supplied as singles

Push Fit Stem Elbow Black

Product Code ELB2-B

- Universal 15 mm x 15 mm 90° push-fit stem elbow
- Fits most makes of thermostatic radiator valve
- Brass with black finish
- Compatible with copper & plastic 15mm pipe
- Supplied as singles

Specifications

Chrome Straight Push-Fit Connectors

Product Code STC1

- Universal 15 mm x 10 mm straight push-fit connector
- Fits most makes of thermostatic radiator valve
- Brass with chrome finish
- Compatible with copper & plastic 10mm pipe
- Supplied in pairs

Anthracite Straight Push-Fit Connectors

Product Code STC1-A

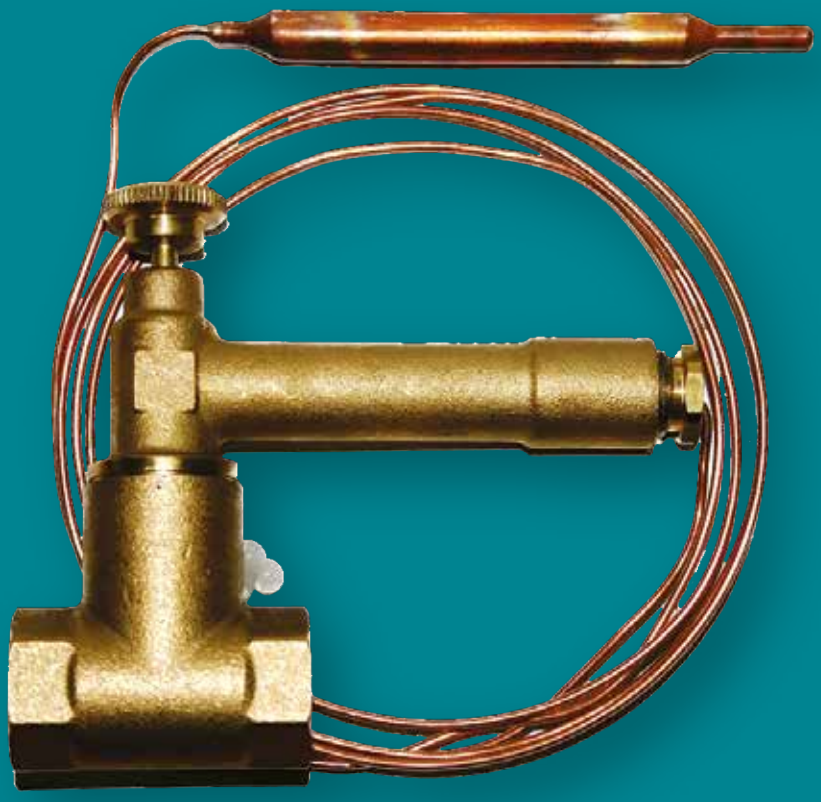
- Universal 15 mm x 10 mm straight push-fit connector
- Fits most makes of thermostatic radiator valve
- Brass with anthracite finish
- Compatible with copper & plastic 10mm pipe
- Supplied as singles

Black Straight Push-Fit Connectors

Product Code STC1-B

- Universal 15 mm x 10 mm straight push-fit connector
- Fits most makes of thermostatic radiator valve
- Brass with black finish
- Compatible with copper & plastic 10mm pipe
- Supplied as singles

Remote Access Fire Valves



RAF Valve - 90°C 1.5m
Product Code TPX06

RAF Valve - 90°C 3m
Product Code TPX07

RAF Valve - 90°C 6m
Product Code TPX08

RAF Valve - 90°C 9m
Product Code TPX09

One good reason for installing a Fire Valve in your house if you have a furnace that burns either fuel oil or liquified petroleum gas is to be safe and minimise the risk of fire.

Oil fired boilers are a blend of electrical and mechanical components developed to produce a fire that is very carefully managed to heat your home to the temperature you desire, regardless of how cold it gets outside.

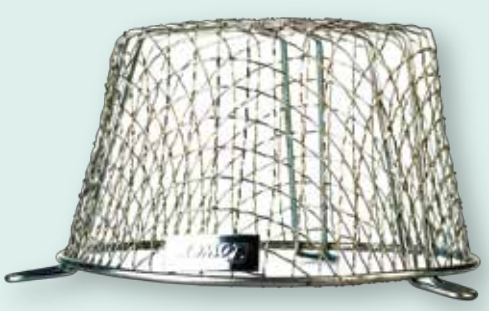
If any one of the many components fails within the oil fired boiler it could possibly result in the fire escaping the confines of the boiler and damage your property.

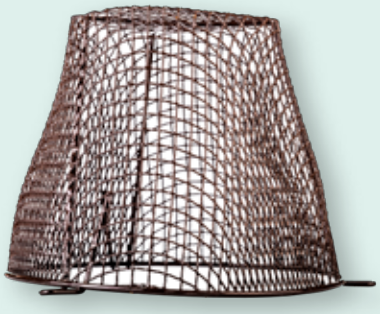
A Fire Valve will stop the fire escaping.

- Minimizes the risk of a fire due to overheating
- Works with oil or liquified petroleum gas
- Compatible with Bio Oil burners
- Valve is installed in the fuel line to stop supply
- Connects to the temp sensor by capillary tube
- Sensor trigger point 90°C
- Sleep easy knowing you are protected

OFCERT Licence

Zinc, Plastic Coated and Stainless Steel Guards





10 x 4.5" (255 x 115mm)

Zinc Coated Product Code CGDK1

Plastic Coated Product Code CGDK1BR

11 x 6.5" (280 x 165mm)

Zinc Coated Product Code CGDK3

Plastic Coated Product Code CGDK3BR

Stainless Steel Product Code CGDK3SS

7 x 4" (178 x 102mm)

Zinc Coated Product Code CGDK4

Plastic Coated Product Code CGDK4BR

Stainless Steel Product Code CGDK4SS

11.5 x 9" (290 x 230mm)

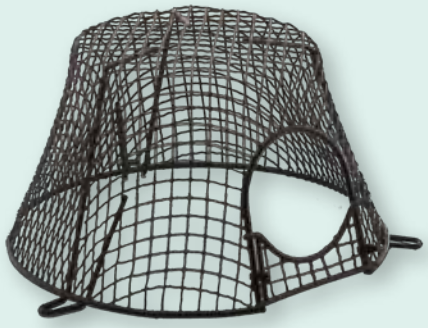
Not available in Zinc Coated

Plastic Coated Product Code CGDK6BR

Stainless Steel Product Code CGDK6SS

- Zinc plated, Brown plastic coated or Stainless steel finish
- Easy to install
- Widely specified and used by BRITISH GAS
- Zinc guards – suitable for non-condensing gas boilers
- Plastic coated guards – suitable for condensing gas boilers
- Stainless steel guards – suitable for condensing & non-condensing oil and gas boilers

High Level - Plume Management Guards



High Level (Plume Management) Circular Terminal Guard

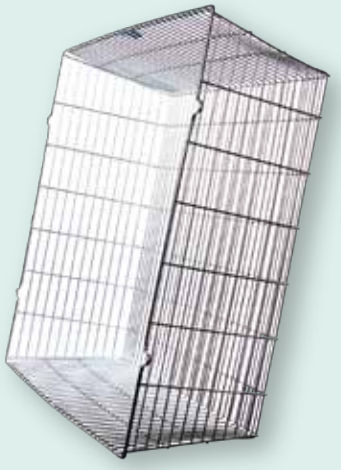
- Easy to install
- Widely specified and used by BRITISH GAS
- Suitable for condensing gas boilers
- Brown plastic coated
- Now with additional mesh to enclose inlet.

10 x 4.5" (255 x 115mm) - Code CGDK1HLBRM

11 x 6.5" (280 x 165mm) - Code CGDK3HLBRM

11.5 x 9" (290 x 230mm) - Code CGDK3HLBRM

Rectangular Guards



- Zinc plated
- Easy to install
- Widely specified and used by BRITISH GAS
- Suitable for non-condensing gas boilers
- Equally suitable for guarding light fittings
- 28w2D bulkheads
- 400w son
- 500w TH fittings and more

9" x 8" x 5" (230 x 200 x 130mm) - Code TGD090805

11 x 11 x 10.5" (280 x 280 x 267mm) - Code TGD1111105

11 x 11 x 10.5" (280 x 280 x 267mm) - Code TGD1111105JS
- JS 500 finish

11 x 11 x 10.5" (280 x 280 x 267mm - Code TGD1111105SS
- Stainless steel finish

11 x 11 x 10.5" (280 x 280 x 267mm - Code TGD1111105BR
- Brown plastic coated

14 x 14 x 8" (355 x 355 x 200mm) - Code TGD141408

14 x 14 x 13" (355 x 355 x 330mm) - Code TGD141413BR
- Brown plastic coated

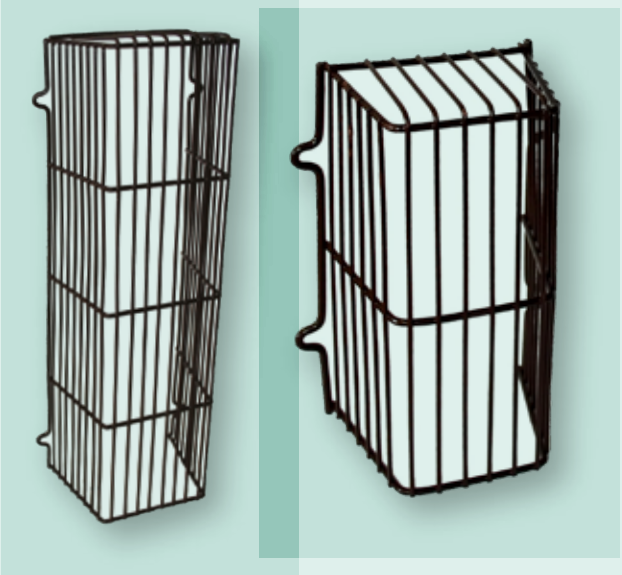
16 x 16 x 7" (400 x 400 x 180mm) - Code TGD161607

18 x 16 x 10" (460 x 406 x 250mm) - Code TGD181610

18 x 18 x 8" (460 x 460 x 200mm) - Code TGD181808

20 x 20 x 8" (508 x 508 x 200mm) - Code TGD202008

Boiler Overflow Guards



- Safety guard against boiler overflow
- Designed for your safety

16 x 4 x 4" (400 x 102 x 102mm) - Code TGDOF1644

8 x 4 x 3" (204 x 102 x 76mm) - Code TGDOF843

HM Government

The Building Regulations 2010

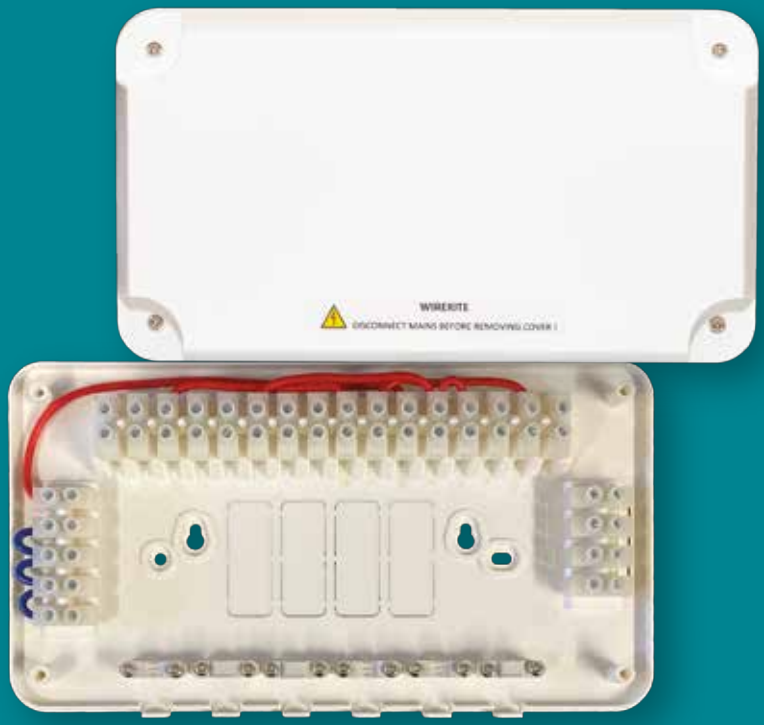
Sanitation, hot water safety and water efficiency

b. downward discharges at low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.

APPROVED DOCUMENT **G**

Wirerite - 16 way junction box

Product Code WIR16JB



- Adequate room for S-plan or Y-plan wiring
- Pre-wired links for easy installation
- 4 pre-linked neutral terminals
- 4 pre-linked earth terminals
- 4 knockouts for in-wall wiring
- 6 knockouts with cable restraints for surface wiring

6 Way Junction Box

Product Code JB6W

- Designed to facilitate the interconnection of heating controls in conjunction with Tower Multi Core Flex
- For use as an intermediate connection box

12 Way Wiring Centre

Product Code WIR12JB

3 Core Multi Colour Flex

Product Code FLX35075

Tower multi-core flex allows the interconnection of heating controls, since multi-core connections are required between devices, e.g. 5-core from programmer, or motorised valve. Standard flex is p.v.c. Insulated.

- Specifically designed for heating installations
- 50 metre reels; 0.75mm C.S.A. stranded copper
- Conforms to BASEC colour coding

4 Core Multi Colour Flex

Product Code FLX45075

- Specifically designed for heating installations
- 50 metre reels; 0.75mm C.S.A. stranded copper
- Conforms to BASEC colour coding

5 Core Multi Colour Flex

Product Code FLX55075

- Specifically designed for heating installations
- 50 metre reels; 0.75mm C.S.A. stranded copper
- Conforms to BASEC colour coding

6 Core Multi Colour Flex

Product Code FLX65075

- Specifically designed for heating installations
- 50 metre reels; 0.75mm C.S.A. stranded copper
- Conforms to BASEC colour coding

Specifications

- Designed to facilitate the interconnection of heating
- controls in conjunction with Tower Multi Core Flex
- For use as a heating system wiring centre

OPTIMUM

A premium range of heating and electrical control equipment. The Optimum range was created and designed by our team based in Kent, United Kingdom.

The key focus and direction of the design team, led by John Todd, with forty years of experience in the industry, was the accuracy and precise detail required, to ensure a product that met the highest quality standards expected in a competitive market.

A background of supporting some of the major boiler manufacturers across Europe since 1980 has given the company an understanding of what is required to provide consistently reliable quality products. Notwithstanding this approach, product quality is constantly reviewed based on market experience and feedback.

Albeit the Optimum brand is relatively new, it has already created a name within the trade, OEM and national merchant sector, for innovative design and quality.

Although the focus has been on quality and design, we also continue to recognise that cost remains a key attribute. Our sourcing strategy maximises opportunities to obtain premium products that are engineered for best cost advantage.

OPTIMUM

WiFi Time Switches

Socket Box Time Switches

Immersion Heater Timers

Economy 7 Timer

Universal Time Switches

Synchronous Timer Modules

Plug-in Time Switches

Room Thermostats

Motorised Valves

Actuators

Designed by TFC Group in the UK

OPTIMUM

24 Hour Socket Box Timer

Product Code OP-SBST

OP-SBST is a captive-tappet 24-hour time switch. Each tappet operates for 15 minutes. The timer is suitable for installation on a surface or in-wall pattress box. The 24 hour dial controls a volt-free changeover switch, with a resistive rating of 16 amperes.

- Designed to mount directly over a single pattress
- 24 Hour
- 15 Minute tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Captive tappets
- Timed / OFF / Constant selection
- Volt free SPDT contacts
- Temperature rating: -20T55

LED
• UPTO •
100W

7 Day Socket Box Timer

Product Code OP-SBSW

Specifications

- Designed to mount directly over a single pattress
- 7 Day
- 2 Hour tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Captive tappets
- Timed / OFF / Constant selection
- Volt free SPDT contacts
- Temperature rating: -20T55

LED • UPTO • 100W

Digital Socket Box Timer

Product Code OP-SBSDIGI

- Designed to mount directly over a single pattress
- 24 Hour / 7 Day programming
- 16 Amp resistive, 2.5 Amp inductive
- Minimum setting 1 minute
- Timed On/Off or Advance selections
- 24 memory spaces
- Day group programming
- Rechargeable NiMh cell gives over 2 months running reserve
- Volt free SPDT contacts
- Temperature rating: -20T45

LED • UPTO • 100W

WiFi Socket Box Time Switch

Product Code OP-SBWF01

- Socket box mounting
- Switching capacity 16 (4) Amps
- Communications: Wi-fi ISM 2.4ghz; Wlan 802.11 b/g/n
- Programme Capacity: 15 on / 15 off
- Programme Functions: On/Off - Countdown - Random - Repeat
- Power Consumption: 1va @ 230v 50hz
- Resistive Load: 16 Amperes
- Inductive Load: 4 Amperes (Cos Ø 0.6)
- Temperature Rating: -10T55
- Accuracy: Internet Synchronised
- Min. Timed Switching: 1 Minute
- Manual Override: On / Timed / Off

LED • UPTO • 100W

WiFi 2 & 3 Channel Time Switch

Product Codes OP-SBWF02 & OP-SBWF03

* Programmes can be distributed unevenly e.g. ch1-9, ch2-4, ch3-2

- Socket box mounting
- Communications: Wi-fi ISM 2.4ghz; Wlan 802.11 b/g/n
- Programme Capacity: 15 on / 15 off
- Programme capacity shareable*
- Power Consumption: 1va @ 230v 50hz
- Resistive load: 5 Amperes per channel
- Inductive Load: 2 Amperes (Cos Ø 0.6)
- Temperature Rating: -10T55
- Accuracy: Internet Synchronised
- Min. Timed Switching: 1 Minute
- Manual Override: On / Timed / Off

LED • UPTO • 100W

24 Hour Immersion Heater Timer

Product Code OP-IHTGPT

OP-IHTGPT is a 24 hour immersion heater time switch, suitable for surface mounting. The timer controls a volt-free changeover switch, with a resistive rating of 16 amperes. Pre-fitted (removable) link for mains switching.

- General purpose timeswitch for surface mounting
- 24 Hour
- 15 Minute tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Captive tappets
- Timed / OFF / Constant selection
- Volt free SPDT contacts (remove link)
- Earth park terminal and cable clamps
- Temperature rating: -20T55

LED
• UPTO •
100W

7 Day Immersion Heater Timer

Product Code OP-IHTGPW

Specifications

- General purpose Timeswitch for surface mounting
- 7 Day
- 2 Hour tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Captive tappets
- Timed / OFF / Constant selection
- Volt free SPDT contacts (remove link)
- Earth park terminal and cable clamps
- Temperature rating: -20T55

LED • UPTO • 100W

Digital Immersion Heater Timer

Product Code OP-IHTDIGI

- General purpose Timeswitch for surface mounting
- 24 Hour and 7 day programming
- 16 Amp resistive, 4 Amp inductive
- Minimum setting: 1 minute
- Timed / Advance on/off
- 24 On/Off programs
- Rechargeable NiMh cell gives over 2 months running reserve
- Volt free SPDT contacts (remove link)
- Earth park terminal and cable clamps
- Temperature rating: -20T45

LED • UPTO • 100W

WiFi Universal Boiler Module

Product Code OP-BM/IHTWF01

See Page 60 for boiler compatibility

Make Your Boiler WiFi For Minimal Cost

- Surface mount / Boiler module
- Switching capacity 16 (4) Amps
- Communications: Wi-fi ISM 2.4ghz; Wlan 802.11 b/g/n
- Programme Capacity: 15 on / 15 off
- Functions: On/Off - Countdown - Random - Repeat
- Power Consumption: 1va @ 230v 50hz
- Resistive Load: 16 Amperes
- Inductive Load: 4 Amperes (Cos Ø 0.6)
- Temperature Rating: -10T55
- Accuracy: Internet Synchronised
- Min. Timed Switching: 1 Minute
- Manual Override: On / Timed / 0

Economy 7 Timeswitch

Product Code OP-ECOSAVE

- Multi Tariff Timer with Boost
- Tamper proof timer cover
- Easy to set tappet segments
- Timed control for use of off-peak electricity
- 15 - 120 minute boost control with "ON" indicator light
- Rated voltage: 230V AC ~ 50Hz
- Max current: 16A resistive, 2A inductive
- Max Wattage 3.5K
- Temperature rating: -10T40

24 Hour Universal Time Switch

Product Code OP-TS111.1

OP-TS111.1 is a captive-tappet 24-hour time switch. Each tappet operates for 15 minutes. The timer is suitable for surface, panel and din-rail mounting. The 24 hour dial controls a volt-free changeover switch, with a resistive rating of 16 amperes.

- Single channel
- Synchronous without reserve
- Daily programme
- 15 Minute tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Volt free SPDT contacts
- Incandescent lamp load 1300w
- Surface, flush and DIN rail mounting
- Temperature rating: -20T55

LED
• UPTO •
100W

See page 62 for technical data for all universal time switches

24 Hour Universal Time Switch

Product Code OP-TS111.2

Specifications

- Single channel
- Synchronous without reserve
- Daily programme
- 15 Minute tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Volt free SPDT contacts
- Incandescent lamp load 1300w
- Panel Mounting
- Temperature rating: -20T55

LED • UPTO • 100W

7 Day Universal Time Switch

Product Code OP-TS171.1

- Single channel
- Synchronous without reserve
- Weekly programme
- 2 Hours tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Volt free SPDT contacts
- Incandescent lamp load 1300w
- Surface, flush and DIN rail mounting
- Temperature rating: -20T55

LED • UPTO • 100W

24 Hour Quartz Reserve Time switch

Product Code OP-TS211.1

- Single channel • Quartz with reserve
- Daily programme
- 15 Minute tappet intervals
- 16 Amp resistive, 8 Amp inductive
- Running reserve 150 hours
- Battery charging duration 70 hours
- Volt free SPDT contacts
- Incandescent lamp load 1300w
- Surface, flush and DIN rail mounting
- Temperature rating: -20T55

LED • UPTO • 100W

24 Hour / 7 Day Digital Universal Time Switch

Product Code OP-TS371.1

- 24 Hour and 7 Day programming
- 16 Amp resistive, 4 Amp inductive
- Minimum setting: 1 minute
- Timed / Advance / On / Off
- 24 On / Off programs
- Temperature rating: T45
- Volt free SPDT contacts
- Rechargeable NiMh cell gives over 2 months running reserve
- Surface, flush and DIN rail mounting
- Temperature rating: -20T45

LED • UPTO • 100W

Digital Fused Spur Timer

Product Code OP-DFST

The OP-DFST is a digital fused-spur time switch. The timer is suitable for pattress box mounting. The 7 day programming logic controls a mains-linked switch, with a resistive rating of 13 amperes. There is an inbuilt rechargeable cell to keep the timer running in the event of a loss of mains power. The output can be disconnected by an integrated double-pole isolator switch; the load is protected by a replaceable BS1362 13 Ampere cartridge fuse, within a removeable caddy.

- Digital fused spur timer
- 24 ON/OFF programmable periods
- 13 Ampere switch rating
- Manual override
- Double-pole isolation
- BS 1362 pre-fitted 13Amp fuse
- Pattress box mounting

One Button Boost Timer

Product Code OP-EBT2

The OP-EBT2 is a two hour electronic, one-button boost timer with visual indicator. There are four pre-set timed outputs. Suitable for installation on a surface or in-wall pattress box. The electronic timer controls an internally linked output relay, with a resistive rating of 16 amps. An earth park terminal is provided. Surface-run cord outlet with cable restraint. Press up to 4x to select boost output, press again to cancel.

- 2 Hour electronic Boost Timer
- Socket-box mounting
- Selectable boost- 15min, 30min, 1Hr & 2Hr
- Blue lit visual indicator
- 230v input & output
- Resistive load 16 amperes
- Quartz regulated accuracy (typically +/- 1.0s)
- Temperature rating: -10T45

Single Module Digital Din-Rail Timer

Product Code OP-DIN

Specifications

- Voltage: 230V AC 50/60Hz
- Colour: White
- Pack Qty: 1
- Dimensions: H90 x W18 x D55mm
- Settings: 6 ON + 6 OFF Programmes
- Display: Digital
- Max Load: 16A Resistive, 2A Inductive
- Battery Backup: 100 Hours
- Programming: 7 day or 24 hour

24 Hr Synchronous Timer Module

Code OP-FM1STUH0

- Plug in compatibility with leading boiler manufacturers
- Synchronous timer module with manual override
- Daily programme
- 15 minute tappet intervals
- 16 amp resistive
- 8 amp inductive
- Volt free SPDT contacts
- Incandescent lamp load 1300W
- Timer module without enclosure
- Temperature rating: -20T85

24 Hr Synchronous Timer Module

Code OP-FM1STU00

- Plug in compatibility with leading boiler manufacturers
- Synchronous timer module with NO manual override
- Daily programme
- 15 minute tappet intervals
- 16 amp resistive
- 8 amp inductive
- Volt free SPDT contacts
- Incandescent lamp load 1300W
- Timer module without enclosure
- Temperature rating: -20T85

FM Module Panel Mount Housing

Code OP-HOUSINGP

- FM Module Panel Mount Enclosure

Specifications

- DIN rail mount, 2 modules
- Switching capacity 16 (4) Amps
- Communications: Wi-fi ISM 2.4ghz;
- Wlan 802.11 b/g/n
- Programme Capacity: 15 on / 15 off
- Programmes: On/Off - Countdown - Random - Repeat
- Power Consumption: 1va @ 230v 50hz
- Min. Timed Switching: 1 Minute
- Manual Override: On / Timed / Off

LED • UPTO • 100W

WiFi DIN-Rail Timeswitch

Product Code OP-DRWF01

- Maximum Current: 13A
- Input Voltage: 220-240V
- Max Load Power: 2990W
- Wireless Type: Wi-Fi 2.4GHz
- Smart Life WIFI control - Take control anytime, anywhere.
- Timing and countdown
- Voice control via Alexa or similar Smart Speaker
- Energy Metering Function

Single Smart Plug with Built-In Energy Meter

Product Code OP-WFP

- Maximum Current: 13A
- Input Voltage: 220-240V
- Max Load Power: 2990W
- Wireless Type: Wi-Fi 2.4GHz
- Smart Life WIFI control
- Timing and countdown
- Voice control via Alexa or similar Smart Speaker
- Energy Metering Function

Double Smart Plug with Built-In Energy Meter

Product Code OP-WFD

- Maximum Current: 13A
- Input Voltage: 220-240V
- Max Load Power: 3120W
- Wireless Type: Wi-Fi 2.4GHz
- USB and Type-C Output - (5V 2.4A).
- Smart Life WIFI control
- Timing and countdown
- Voice control via Alexa or similar Smart Speaker
- Separate Intelligent Control

Single Advanced Smart Plug

Product Code OP-WFUSB

Room Thermostats Specifications

Vibe² WiFi Programmable Thermostat
Class IV Control
Product Code OP-WFSTAT

BOILER PLUS

- Class IV control, +2% to system efficiency
- Capacitive touch controls
- Programmable thermostat
- Volt-free output < 10A
- Automatic frost protection
- Receiver 230V 50Hz
- Set-point range: 5° - 35°C
- 868 MHz operating frequency
- WiFi ISM 2.4GHz - WLAN 802.11 b/g/n
- Temperature regulation:
  Selectable On/Off, Optimising, T.P.I

Vibe RF ProgrammableThermostat
Class IV Control
Product Code OP-TPISTAT

BOILER PLUS

- Class IV control, +2% to system efficiency
- Capacitive touch controls
- Programmable thermostat
- Volt free output contacts
- Switching capacity 10A resistive
- Automatic frost protection • Receiver: 230V 50Hz
- Set-point range: 5° - 35°C
- 868 MHz operating frequency
- Selectable On/Off, Optimising or T.P.I regulation

22mm Motorised Mid Position Valve

Product Code OP-MID

The OP-MID is a 3 port spring return mid-position valve with 22mm compression fittings and 230V AC switched output. These are for use on fully pumped systems which when correctly wired with an appropriate room thermostat, cylinder thermostat and programmer will control the water flow from the boiler to either hot water only, heating only, or to both simultaneously.
Supplied with protective plastic covering on the actuator to avoid scratches during shipping/installation and is easily removed once the installation is complete.

- 3 Port Mid-Position 22mm
- Supply voltage 220-240V AC 50Hz
- Power consumption 6W
- Cable length one metre
- Operating temperature range: +5°C to +88°C
- Max. Differential pressure = 1 Bar
- Max. Static pressure 10.0 Bar
- Max. Ambient temperature 52°C
- 4rpm for greater control
- Brass geared synchronous motor

28mm Motorised Mid Position Valve

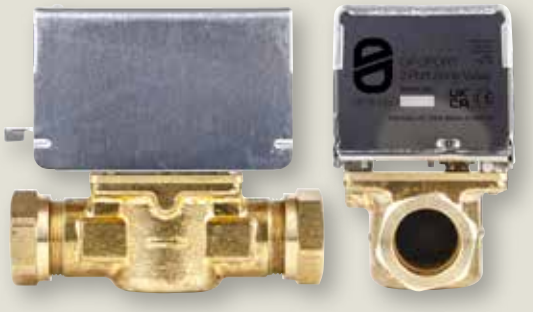
Product Code OP-MID28

Specifications

- 3 Port Mid-Position 28mm
- Supply voltage 220-240V AC 50Hz
- Power consumption 6W • Cable length one metre
- Operating temperature range: +5°C to +88°C
- Max. Differential pressure = 1 Bar
- Max. Static pressure 10.0 Bar
- Max. Ambient temperature 52°C
- 4rpm for greater control
- Brass geared synchronous motor

22mm 2 Port Motorised Zone Valve

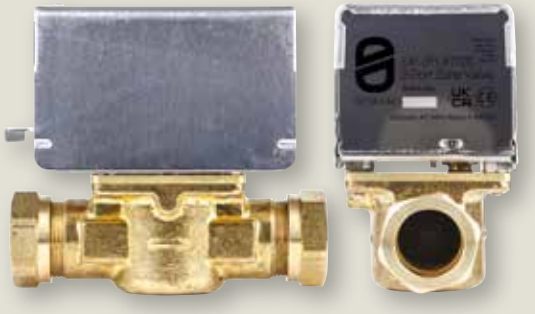
Product Code OP-2PORT



- 2 Port 22mm
- Supply voltage 220-240V AC 50Hz
- Power consumption 6W • Cable length one metre
- Operating temperature range: +5°C to +88°C
- Max. Differential pressure = 1 Bar
- Max. Static pressure 10.0 Bar
- Max. Ambient temperature 52°C
- 4rpm for greater control
- Brass geared synchronous motor

28mm 2 Port Motorised Zone Valve

Product Code OP-2PORT28



- 2 Port 28mm
- Supply voltage 220-240V AC 50Hz
- Power consumption 6W • Cable length one metre
- Operating temperature range: +5°C to +88°C
- Max. Differential pressure = 1 Bar
- Max. Static pressure 10.0 Bar
- Max. Ambient temperature 52°C
- 4rpm for greater control
- Brass geared synchronous motor

2 Port Zone Valve & Mid Position Actuators

Product Codes OP-2PORTH & OP-MIDH

- Interchangeable with Honeywell
- Supply voltage 220-240V AC 50Hz
- Power consumption 6W • Cable length one metre
- Operating temperature range: +5°C to +88°C;
- Max. Ambient temperature 52°C
- OP-2PORTH: 4rpm motor for greater control
- OP-MIDH: 4rpm motor for greater control
- Brass geared synchronous motor

Mechanical Boiler time controls

FM/1 series

Since the late 1980's, TFC Group has been the leading supplier of mechanical timer modules to the UK boiler industry. In the region of 20 million timers have been supplied to the principal UK boiler manufacturers in the intervening period. Hence there is a spares market at a rate of tens of thousands per annum.

There are four basic variants of the standard 230V 50Hz product, available within TFC's Optimum range of time controls.
All timers shown are synchronous motor driven mechanical timers with: 24 hour dial, 96 x 15 minute tappets and manual override (fix ON / Auto / fix OFF). All have nominally rated 16 Ampere volt-free changeover contacts.

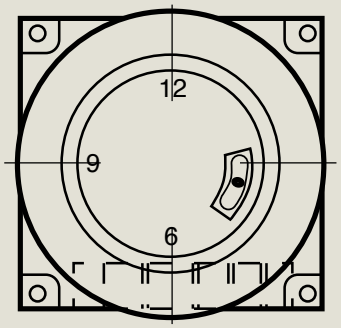
Variants are with or without clock hands, and with tab terminals rotated to match the boiler control interface connection, according to the manufacturer and/or boiler model.

Replacement Timers for Baxi, Potterton, Alpha & Ideal Boilers

BAXI POTTERTON ideal HEATING Alpha HEATING INNOVATION

Standard

Product Code OP-FM1STUH0



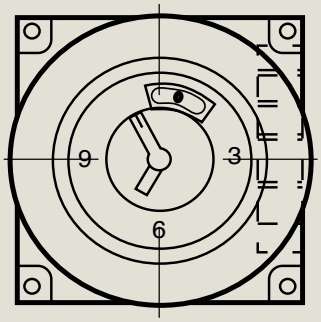
Specifications

Suits all installations with standard tab terminal connection,
230V 50Hz supply to terminals 1 & 2,
Volt-free switching terminals 3, 4 & 5
Baxi part code 247206
Fits Baxi Platinum, Duo-Tec, Gold
Main 24HE, 30HE
Potterton 80E, 105E, Performa 24 & 28

LED • UPTO • 100W

W9

Product Code OP-FM1STUZH-09

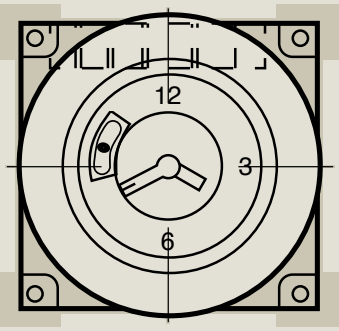


Suits all installations with R.H. tab terminal connection,
230V 50Hz supply to terminals 1 & 2,
Volt-free switching terminals 3, 4 &5
Baxi part code 7658276
Fits Baxi 200 & 400 combi boilers

LED • UPTO • 100W

W18

Product Code OP-FM1STUZH-18

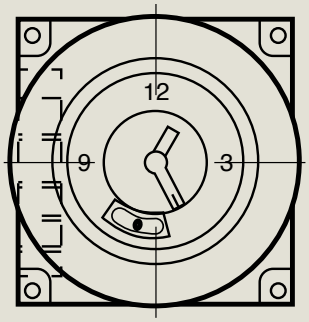


Suits all installations with vertical tab terminal connection,
230V 50Hz supply to terminals 1 & 2,
Volt-free switching terminals 3, 4 &5
Fits Ideal combination boilers:
UIN204839 - Logic and Logic+
UIN201168 - Esprit and Excel
UIN208445 Vogue

LED • UPTO • 100W

W27

Product Code OP-FM1STUZH-27



Suits all installations with L.H. tab terminal connection,
230V 50Hz supply to terminals 1 & 2,
Volt-free switching terminals 3, 4 &5
Alpha part code: 6.1000201
Fits all Alpha combi boilers
Baxi part code 7212341
Fits Baxi Eco Blue combi boilers

LED • UPTO • 100W

Connection of WiFi devices to 5GHz WiFi router:

Many WiFi products – including Optimum WiFi devices – are configured to use the long-established 2.4GHz WiFi frequency. Since 2016, some new WiFi routers come with both 5GHz & 2.4GHz, with a single SSID set with a shared name. WiFi devices can connect with the 5GHz network if close to the router, or the 2.4GHz network if further away – 5GHz is faster but has a reduced range compared to 2.4GHz. Most routers will have a configuration set to use 5GHz as the preferred connection. If you try to connect to an Optimum WiFi device and can't (the connect function goes full circle and then fails), your mobile may be connected to the 5GHz network. You will need to go into the Admin page of the router. You may need to refer to the router documentation, or contact your service provider for help with this. Separate the channels and re-name the 2.4GHz/5GHz networks with different names e.g. add 2g or 5g to the end of each SSID respectively. Re-connect your phone to WiFi, selecting the re-named 2.4GHz network. You should now be able to set up the WiFi controls in the usual fashion.

Once the WiFi controls are set up in this way, control of WiFi devices is possible whether the mobile is connected to 5GHz or 2.4GHz. That's because the input from your mobile is actually sending data to the server, which is then relaying the control commands or programming changes back to the WiFi device via your router, and because the WiFi router is dual-band, it can address devices connected to either the 5GHz or 2.4GHz networks.

If this fails, please check your Firewall settings have no security features enabled to prevent new devices connecting. You may need to refer to the router documentation, or contact your service provider for help with this.

Volt-free switching:

A thermostat or timer with 'volt-free contacts', or 'volt-free switching', operates a switch that opens and closes its contacts, but no voltage or current will flow. When a product has volt-free contacts, the installing electrician must ensure that the correct voltage (to be switched) is connected to the 'common' contact of the switch. This voltage, once connected to common, will then be fed to the circuit to be controlled, via the normally open contact. Wiring connected to the common contact must be suitably rated for the load current. The advantage of such an arrangement is that e.g. a mains-powered timer can switch a non-mains circuit, such as a low voltage alarm or lighting circuit.

Switching lighting loads:

Lighting can be a problematic load because of very high inrush current compared to the running current requirement. This particularly applies to high efficiency fluorescent, and other types of HID lamps as well as LED lighting. This is because these types of luminaires frequently have starter gear or a transformer that uses power factor correction on the start-up circuit. This can cause an inrush current that is hundreds of times higher than the running current and overloads the contacts. Although this may only exist for 5 or 10 milliseconds, it is enough time to tack weld the output contacts. If you are connecting a timer to a lighting load you may need to switch the lighting circuit with a contactor. If in doubt contact our technical support line.

Is my mid-position valve faulty if it stays in the heating position after the system shuts down?

No, the valve will remain in that state until power is removed or hot water is called for. The synchronous motor is rated for running in a continuously stalled state.

The valve will feel hot to the touch, as the energy of the stalled motor is dissipated through the valve body. This is normal and the valve is designed to operate in this way.

To avoid this happening.... Set the Hot water to go into demand after the heating has switched off.

Can I change the actuator head of my Tower or Optimum motorised valve without draining down the heating system?

Yes. All Tower and Optimum motorised valves have replaceable motorised actuators.

OP-BM/IHTWF01, OP-FM1STUH0 & OP-FM1STU00 Boiler Compatibility

WiFi Universal Boiler Module OP-BM/IHTWF01 and 24 Hr Synchronous Timer Modules OP-FM1STUH0 & OP-FM1STU00 are compatible all combi boilers that have a 230V 24 hour mechanical timer, including:

Alpha: E-Tec and E-Tec Plus 28 & 33, Intec 40GS2

Baxi: 200 Combi – 224 & 228, 400 Combi – 424 & 428, 600 Combi – 624, 630 & 636 (wired as external control), 600 Combi LPG – 624 & 630 (wired as external control), Duo-Tec Combi – 24, 28, 33, 40 & 28 LPG, Platinum Combi – 24, 28, 33 & 40, EcoBlue Advance Combi – 24, 28, 33 & 40

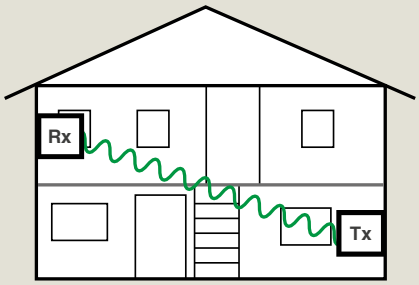
Potterton: Assure Combi – 25, 30 & 36 (wired as external control), Promax Combi – 24, 28 & 33, Gold Combi – 24, 28 & 33, Titanium Combi – 24, 28, 33 & 40,

Ideal: Logic & Vogue Combi boilers, pre 2016 models only (with mains-operated built-in timer), Independent Combi boiler, pre 2016 model only (with mains-operated built-in timer)

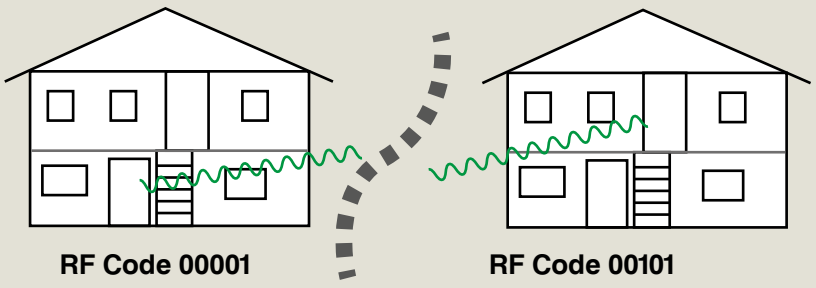
RF signal strength

Radio frequency controls use very low-power radio waves to communicate. In conventional brick-built properties with wooden suspended floors, these devices can communicate reliably over a typical range of 20 – 30 metres: more than enough for most properties. In properties with reinforced concrete construction, or foil-backed plasterboard, these feature present a partial block to radio waves. Siting of radio frequency transmitter and receiver under these circumstances may require some consideration. See the diagram for additional information:

Radio Frequency Controls - Range, Coding & Signal Attenuation



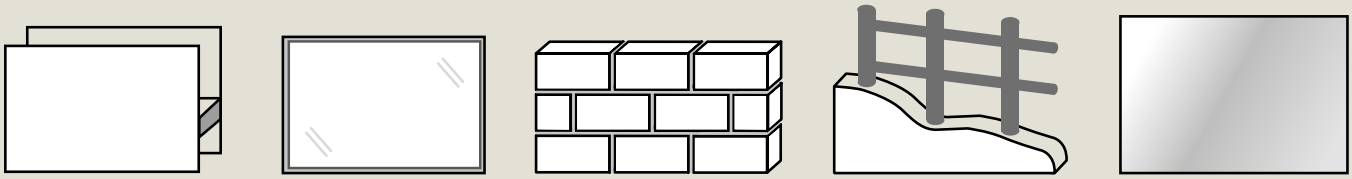
Recommendation: Limit obstacles to a maximum of 2 walls plus 1 ceiling



Different codes ensure that adjacent RF systems on the same frequency do not conflict

Approximate reduction in RF signal stength after passing through different materials

Note: Large kitchen appliances or mirrors in the line-of-sight between Tx and Rx will weaken or bock signals



Stud Partition
5 - 20%

Glass
10 - 30%

Brick & Morter
10 - 40%

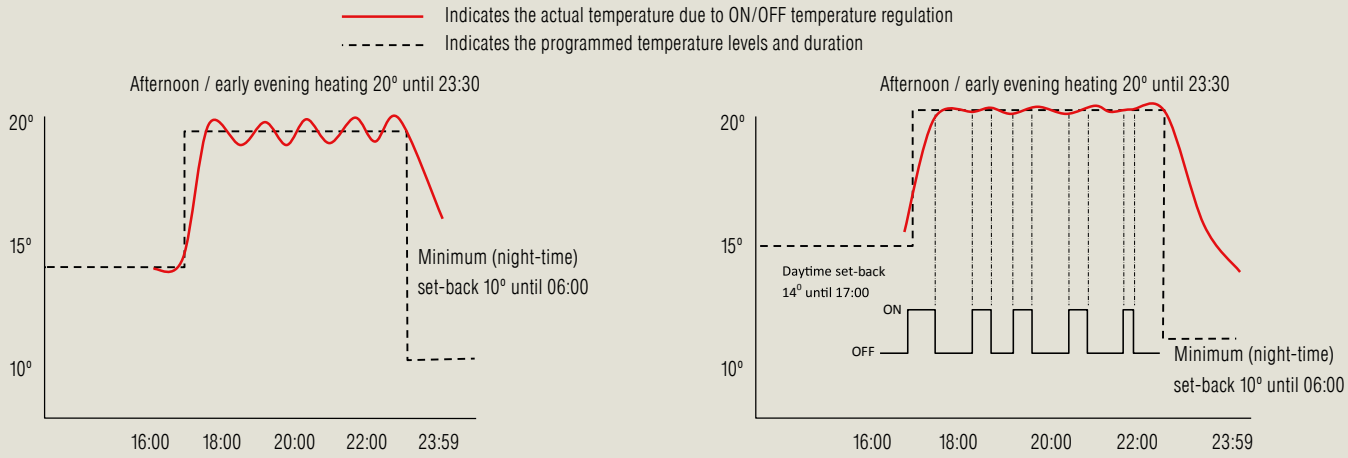
Re-inforced Wall
40 - 80%

Solid Metallic Surface
90 - 100%

The OPTIMUM VIBE can be set to provide any of Two-point, Optimising or T.P.I. temperature regulation.

A T.P.I. temperature control is recognised within the scope of the European Ecodesign Directive as a 'Class IV' device, contributing 2% towards the efficiency of a heating system. The UK Depart-ment for Business, Energy and Industrial Strategy published criteria for controls which recognises that devices with 'automation and optimisation' fulfil an enhanced requirement of control putting them into their 'Boiler Plus' control category.

The differences between Two-point and T.P.I. temperature regulation are explained below.



Two-point temperature regulation

T.P.I. temperature regulation

Two-point temperature regulation switches the heating ON and OFF when the thermostat recognises that the temperature has risen below and above the set point by a fixed value (the differential), e.g. 0.5 or 1.0°C. The effect of two-point temperature regulation is to deliver an average temperature which equals the set value, but the actual temperature is swinging above and below the set point, as there is no other logic or control apart from the differential value, which cannot be reduced below 0.5°C. When the temperature is above the set point, energy is being wasted. In addition, the room(s) being heated will alternately feel too hot, and then too cold, so comfort is reduced.

When T.P.I. regulation has been selected, the heating will be switched On and Off according to an algorithm, which works out the best way to regulate the temperature as closely as possible to the set point. When a building is heated, the temperature starts to increase. If the heating is switched off, the temperature will continue to increase for a short time, due to the remnant heat in the system, which has to pass from the radiators into the rooms. T.P.I. (Time proportional / Integral) temperature regulation technique is designed to work with this characteristic, to avoid over - and under - shooting the set temperature.

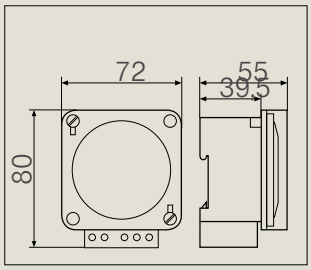
In practise, this means that the thermostat will switch the heating On, and monitor the rate of rise of temperature, until the temperature starts to approach the set point. Before the tempera-ture reaches the set point, the thermostat will switch the heating Off, allowing the remnant heat to make - up the difference. The thermostat will continue to switch the heating On and Off in an anticipatory fashion, in order to keep the actual temperature as close as possible to the set point. The result is that the actual temperature will avoid the over - under - shooting which results from the ON/OFF regulation technique. The benefit to the occupants is that energy is not wasted, and the temperature is more comfortable. According to the Building Research Establishment*, energy cost savings can be between 6 and 10% compared to a thermostat using a simple ON/OFF temperature control method.

* **source:** BRE Report September 2017 "Compensation and TPI Heating Controls"

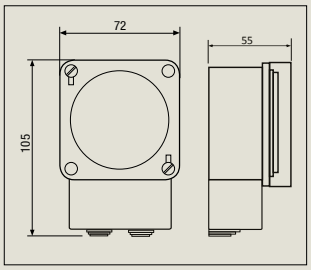
	OP-TS111.1 OP-TS171.1	OP-TS111.2	OP-TS211.1
Dimensions H x W x D (mm)	105 x 72 x 55	72 x 72 x 55	105 x 72 x 55
Distributor cut-out (mm)	66 x 66	66 x 66	66 x 66
Dimensions of front frame (mm)	72 x 72	72 x 72	72 x 72
Fitting depth (mm)	39.5	39.5	39.5
Weight (g) approx.	155	155	155
Nominal voltage	220-240 V AC / 50 Hz	220-240 V AC / 50 Hz	230 V AC
Power consumption at 230 V~ (AC)	1VA	1VA	2VA
Current output			
– relay	changeover contact, potential-free	changeover contact, potential-free	changeover contact, potential-free
Switching current AC			
– ohmic load (VDE, IEC)	16 A / 250 V AC	16 A / 250 V AC	16 A / 250 V AC
– inductive load cos. φ 0.6	8 A / 250 V AC	8 A / 250 V AC	8 A / 250 V AC
– incandescent lamp load	1300 W	1300 W	1300 W
Minimum switching current AC	100 mA / 20 V AC	100 mA / 20 V AC	100 mA / 20 V AC
Minimum switching current DC	100 mA / 20 V DC	100 mA / 20 V DC	100 mA / 20 V DC
Power reserve	–	–	150 h
Battery charge time	–	–	70 h
Accuracy	synchronic to network	synchronic to network	Typ ± 1.5 sec /day at +20°C
Ambient temperature	-20°C ... +55°C	-20°C ... +55°C	-20°C ... +55°C
Protection class	II	II	II
Sealable	possible	possible	possible
According to	EN 60730-1 EN 60730-2-7	EN 60730-1 EN 60730-2-7	EN 60730-1 EN 60730-2-7
Type of connection	screw terminal	flat DIN 6.3mm fitted socket	screw terminal

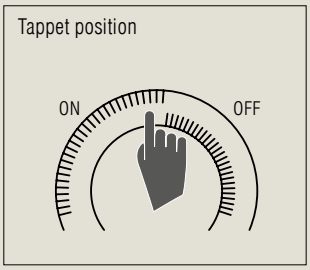
Dimensional drawings / circuit diagrams:

OP-TS111.2

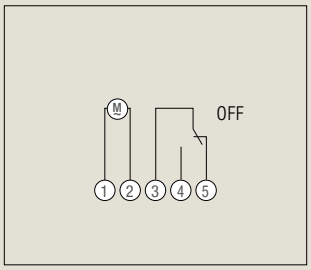


OP-TS111.1 OP-TS171.1
OP-TS211.1 OP-TS371.1





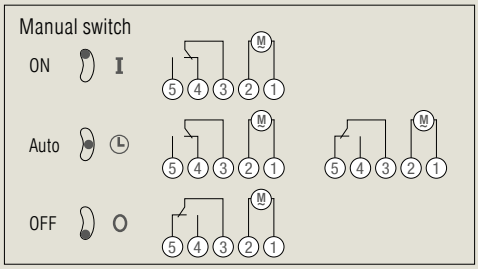
All products



OP-TS371.1
105 x 72 x 55
66 x 66
72 x 72
39.5
155
230 V AC / 130 V DC
2VA
changeover contact, potential-free
16 A / 250 V AC
21 A / 250 V AC
4 A / 250 V AC
1300 W
100 mA / 20 V AC
100 mA / 20 V DC
2 months plus
70 h
± 2.5 sec./day
-20°C ... +55°C
II
possible
EN 60730-1
EN 60730-2-7
screw terminal

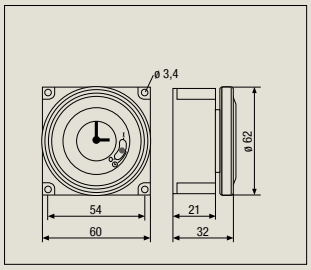
	OP-FM1STUH0 OP-FM1STU00
Dimensions H x W x D (mm)	60 x 60 x 32
Distributor cut-out (mm)	ø 64
Fitting depth (mm)	21
Weight (g) approx.	75
Nominal voltage	220-240 V AC / 50 Hz
Power consumption at 230 V~ (AC)	1VA
Current output	
– relay	changeover contact, potential-free
Switching current AC	
– ohmic load (VDE, IEC)	16 A / 250 V AC
– inductive load cos. φ 0.6	8 A / 250 V AC
– incandescent lamp load	1350 W
Minimum switching current AC	100 mA / 20 V AC
Minimum switching current DC	100 mA / 20 V DC
Power reserve	–
Battery charge time	–
Accuracy	synchronic to network
Ambient temperature	-20°C ... +85°C
Protection class	II
According to	EN 60730-1
	EN 60730-2-7
Type of connection	Fitted socket DIN 6.3mm

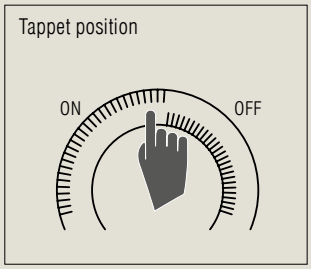
Output switch states for timer modules:
Mechanical timers except OP-FM1STU00



Dimensional drawings / circuit diagrams:

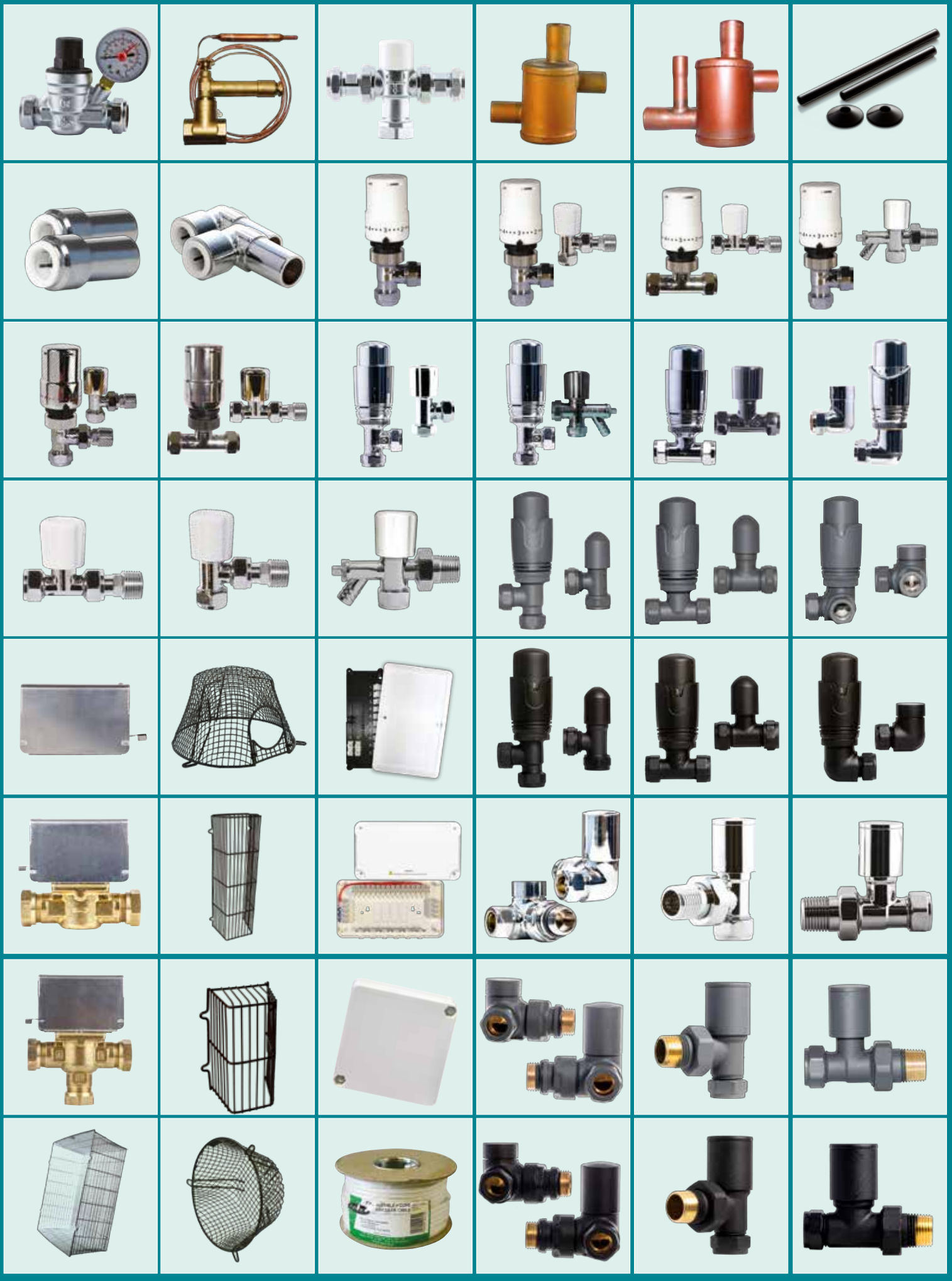
OP-FM1STUH0 OP-FM1STU00






Boost
inhibitor
cleanser
silencer

Control Solutions



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bsi. ISO 9001:2015 Quality Management
Cert No: RS 30178