



## Series 48 Filter Housing Heaters

### HEATER JACKETS FOR SINGLE ROUND FILTER HOUSING SIZES 5" TO 30"

Series 48 Filter Housing Heaters are a cost-effective and low maintenance solution for biopharmaceutical processes requiring superior thermal control. MKS Series 48 heaters prevent vapor condensation in sterile vent and process filters and piping systems and help maintain preferred material viscosities. Series 48 heaters offer tight temperature control and advanced functionality, while complying with strict safety regulations.

MKS' Series 48 heaters feature a unique temperature controller which integrates a temperature process controller, a high-low temperature alert, and power switching with a safety high limit — all inside a NEMA 4X enclosure. The controller features a user-friendly digital display and an optional Modbus RTU Communications module allows users to remotely adjust parameters through its RS485 interface.

### Features & Benefits

#### Improved Heater Design

- Specially designed heater jackets for optimum performance and increased thermal uniformity
- Thermocouple embedded in heater mat for tight temperature control
- Corrosion-resistant stainless steel snaps for easy installation or removal
- Contoured foam insulator covers dome section to prevent heat loss
- External heater surfaces safe to touch
- UL listed and CE tested and marked for both electrical and thermal safety

#### Advanced Temperature Control

- User-adjustable and resettable temperature set-points for advanced process control
- User-friendly communication and display options provide greater temperature control versatility and functionality
- Adjustable and resettable safety limit device integrated into controller circuitry eliminates the need for a thermal fuse
- Optional Modbus communications allows for remote display, control, and diagnostics of individual heater status

- No-arc relay ensures long controller lifetime and increased reliability
- Programmable Low Temperature Alert / High Temperature Alert (LTA/HTA) integrated into controller circuitry
- Multiple LEDs display controller/heater operating and alert conditions and status

#### NEMA 4X Compliance

- Heater jacket, controller and cables are certified to NEMA 4X requirements
- Water and dust resistant
- Corrosion resistant
- Resists damage from ice buildup

#### Additional Features

- Control components reside inside controller, away from heat source, extending heater life
- Increased energy efficiency outperforms steam-jacketed housings
- Optional Series 48 software adjusts control parameters on individual heaters from a remote location quickly and easily
- Software monitors temperatures, provides graphical output and offers data logging capability
- Fast delivery of standard heaters. Custom heaters available upon request



## Applications

MKS Series 48 filter housing heaters are used in conjunction with sterile vent and process filter housings and are ideally suited for processes such as:

- Bioprocessing and Pharmaceutical Process Fluids
- Fermentation
- Product Recovery
- Water for Injection
- Filtration and Purification Processes
- Skidded Systems
- Tanks and Vessels

The NEMA rated heaters allow for installation in the harshest of environments. The units can be mounted in any location where moisture is present, including clean-in-place (CIP) washdown areas.

## Description

The Series 48 filter housing heaters consist of molded silicone foam with a thermocouple embedded in the heater mat. The contoured design conforms to the housing body, preventing heat loss. The heaters are easily removed for filter cartridge replacement.

Each heater features a separate temperature controller inside a polycarbonate/ABS NEMA enclosure. The temperature controller provides unsurpassed thermal control via two micro-processor control circuits, each with a power relay — one dedicated to temperature control and the other to over-temperature protection. This significantly reduces downtime potential and the need to stock spare heaters.

The temperature controller manages all of the functions for the heater, including: temperature control, thermal safety, and operating status notification via three colored LEDs.

Temperature controllers are available in two different options: a Display Module or a Display and Communications Module. The Display Module (Figure 1) allows the user to locally adjust the operating parameters, including temperature set point, high/ low temperature alerts, high limit (safety) set point, control mode (on-off/PID) and related parameters. It contains an alphanumeric LED display that displays the heater's current temperature and alert condition.



Figure 1 - Display Module

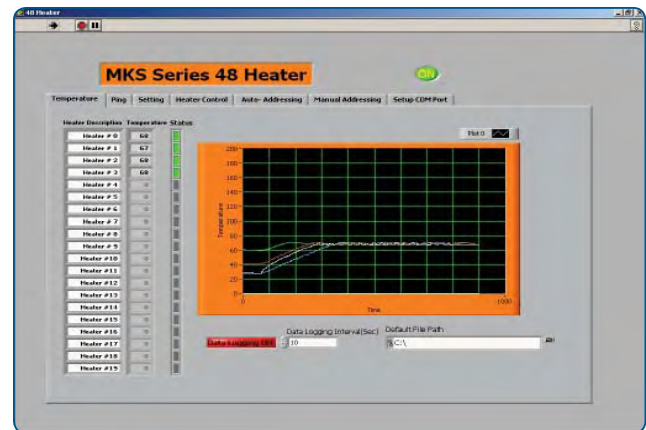
The Display and Communications Module (Figure 2) includes all the functionality of the Display Module, but adds Modbus RTU communications with an RS485 interface. This allows users to remotely adjust the operating parameters and monitor heater operating status. The temperature controller is housed inside a protective NEMA 4X rated enclosure that is resistant to water and dust. The enclosure is also resistant to corrosion and damage from ice buildup.



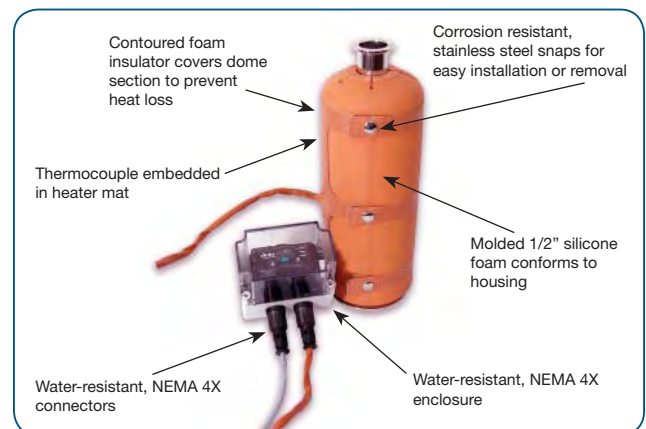
Figure 2 - Display & Communications Module

## Series 48 Software

- Optional Series 48 software for remote monitoring, diagnostic, and control interface
- Adjusts temperature and control parameters on individual heaters from a remote location quickly and easily
- Allows easy modification of control parameters for up to 256 individual heater controllers, including:
  - Operating temperature
  - Low temperature alert/high temperature alert (LTA/HTA)
  - Safety limit temperature
  - Control type (on-off/PID)
  - PID parameters
- Software includes data-logging capability, graphic output, and auto-address function
- Series 48 heater software is available for free download at [www.mksinst.com/vtsw](http://www.mksinst.com/vtsw)



## Series 48 Software



## Heater Features



# Specifications

## Heater Specifications

<b>Pre-Set Temperature Set Points</b>	95°C (203°F)
<b>Exterior Range Temperature</b>	Ambient to » 43°C (109°F) (based on 95°C set point)
<b>Interior Range Temperature</b>	Ambient to 185°C (365°F)
<b>Foam Thickness</b>	0.5 in. (12.7 mm)
<b>Materials</b>	Molded silicone foam, fiberglass reinforced silicone, Teflon insulated wire
<b>Connectors</b>	Bulgin Mini Buccaneer
<b>Weight Range</b>	1 to 5 lbs (0.45 to 2.27 kg)
<b>Product Safety</b>	UL®/C-UL Listed, CE, Semi S <sub>2</sub> , NEMA 4X

## Power Consumption

120VAC	240VAC
5" heater = 1.31A	5" heater = 0.65A
10" heater = 2.33A	10" heater = 1.16A
20" heater = 4.37A	20" heater = 2.18A
30" heater = 5.00A	30" heater = 3.21A

## Controller Specifications

<b>Enclosure</b>	Polycarbonate Lid, ABS Base
<b>Power Requirements</b>	100-240VAC input (240VAC provided with flying leads)
<b>Power Consumption</b>	0.3 W
<b>Relay Contact Rating</b>	SPDT, 2 A @ 50 VAC resistive, 1 A @ 30 VDC
<b>Dimensions</b>	4.69" x 2.72" x 4.61" (119 x 69 x 117 mm)
<b>Product Safety</b>	UL®/C-UL Listed, CE, Semi S <sub>2</sub> , NEMA 4X

## Dry Contact

Optional access port for dry-contact relay provides a remote signal indicating whether the heater is within or outside of the preferred temperature range. The temperature range is user-adjustable. When the heater is within this preferred temperature range the relay is closes. When the heater is outside the temperature range, either above or below, the relay will be open.

## Other Products from MKS

### Series 26 Filter Housings

MKS Series 26 single round filter housings are engineered to give customers a complete modular solution with excellent drainability and cleanability features. Our machining and polishing processes are optimized to yield a consistent fit and finish that is superior in the industry. All wetted materials of construction are 316L stainless steel, and silicone gaskets are standard, to handle the demands of steam sterilization. Series 26 filter housings are used in a full range of applications including processes for both gas and liquid filtration.



### Custom Filter Housings

For customers' unique process needs, MKS also offers custom filter housing solutions designed by our in-house engineering staff. Custom solutions include:

- ASME section VIII U and UM stamp approved vessels
- L-pattern housings
- T-Line housings without a gauge port
- Steam jacketed housings
- Diaphragm vent and drain options utilizing customer preferred valves
- Customer specified designs



### Series 25 Stainless Steel Fittings

Series 25 is a comprehensive line of buttweld and clamp fittings, including ferrules, gaskets, clamps, and tubing designed and manufactured in compliance with ASME BPE specifications for the biotechnology and pharmaceutical processing industries. Fittings and tubing are available in both mechanically polished and electropolished ID surface finishes ranging from 15 Ra maximum to 20 Ra maximum, with a variety of OD polished options to service all applications. The OD of all tubing is mech-anically polished to a 30 Ra finish. Tubing is supplied standard in 20 foot lengths in a cleaned, capped and bagged condition.



# Ordering Information

## Series 48 Filter Housing Heaters, 120V

Part Number	Description	Price
48-1105-1	5" Single Round Heater, w/ Display, 120V, Cable w/ Flying Leads	
48-1105-2	5" Single Round, w/ Display, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-1105-3	5" Single Round Heater, w/ Display, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-1110-1	10" Single Round Heater, w/ Display, 120V, Cable w/ Flying Leads	
48-1110-2	10" Single Round Heater, w/ Display, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-1110-3	10" Single Round Heater, w/ Display, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-1120-1	20" Single Round Heater, w/ Display, 120V, Cable w/ Flying Leads	
48-1120-2	20" Single Round Heater, w/ Display, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-1120-3	20" Single Round Heater, w/ Display, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-1130-1	30" Single Round Heater, w/ Display, 120V, Cable w/ Flying Leads	
48-1130-2	30" Single Round Heater, w/ Display, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-1130-3	30" Single Round Heater, w/ Display, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-2105-1	5" Single Round Heater, w/Display, 120V, Cable w/Flying Leads, Dry Contact Access Port	
48-2105-2	5" Single Round Heater, w/Display, 120V, Cable w/Wall Plug (NEMA 5-15P), Dry Contact Access Port	
48-2105-3	5" Single Round Heater, w/Display, 120V, Cable w/Water-Resistant Plug (NEMA L5-15P), Dry Contact Access Port	
48-2110-1	10" Single Round Heater, w/Display, 120V, Cable w/Flying Leads, Dry Contact Access Port	
48-2110-2	10" Single Round Heater, w/Display, 120V, Cable w/Wall Plug (NEMA 5-15P), Dry Contact Access Port	
48-2110-3	10" Single Round Heater, w/Display, 120V, Cable w/Water-Resistant Plug (NEMA L5-15P), Dry Contact Access Port	
48-2120-1	20" Single Round Heater, w/Display, 120V, Cable w/Flying Leads, Dry Contact Access Port	
48-2120-2	20" Single Round Heater, w/Display, 120V, Cable w/Wall Plug (NEMA 5-15P), Dry Contact Access Port	
48-2120-3	20" Single Round Heater, w/Display, 120V, Cable w/Water-Resistant Plug (NEMA L5-15P), Dry Contact Access Port	
48-2130-1	30" Single Round Heater, w/Display, 120V, Cable w/Flying Leads, Dry Contact Access Port	
48-2130-2	30" Single Round Heater, w/Display, 120V, Cable w/Wall Plug (NEMA 5-15P), Dry Contact Access Port	
48-2130-3	30" Single Round Heater, w/Display, 120V, Cable w/Water-Resistant Plug (NEMA L5-15P), Dry Contact Access Port	
48-3105-1	5" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Flying Leads	
48-3105-2	5" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-3105-3	5" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-3110-1	10" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Flying Leads	
48-3110-2	10" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-3110-3	10" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-3120-1	20" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Flying Leads	
48-3120-2	20" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-3120-3	20" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	
48-3130-1	30" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Flying Leads	
48-3130-2	30" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Wall Plug (NEMA 5-15P)	
48-3130-3	30" Single Round Heater, w/ Display & Communications, 120V, Cable w/ Water-Resistant Plug (NEMA L5-15P)	

## Series 48 Filter Housing Heaters, 240V

Part Number	Description	Price
48-1205-1	5" Single Round Heater, w/ Display, 240V, Cable w/ Flying Leads	
48-1210-1	10" Single Round Heater, w/ Display, 240V, Cable w/ Flying Leads	
48-1220-1	20" Single Round Heater, w/ Display, 240V, Cable w/ Flying Leads	
48-1230-1	30" Single Round Heater, w/ Display, 240V, Cable w/ Flying Leads	
48-2205-1	5" Single Round Heater, w/Display, 240V, Cable w/Flying Leads, Dry Contact Access Port	
48-2210-1	10" Single Round Heater, w/Display, 240V, Cable w/Flying Leads, Dry Contact Access Port	
48-2220-1	20" Single Round Heater, w/Display, 240V, Cable w/Flying Leads, Dry Contact Access Port	
48-2230-1	30" Single Round Heater, w/Display, 240V, Cable w/Flying Leads, Dry Contact Access Port	
48-3205-1	5" Single Round Heater, w/ Display & Communications, 240V, Cable w/ Flying Leads	
48-3210-1	10" Single Round Heater, w/ Display & Communications, 240V, Cable w/ Flying Leads	
48-3220-1	20" Single Round Heater, w/ Display & Communications, 240V, Cable w/ Flying Leads	
48-3230-1	30" Single Round Heater, w/ Display & Communications, 240V, Cable w/ Flying Leads	

NOTE: All power cords are supplied in 20 ft. lengths as standard. For custom lengths, please contact your local MKS representative.



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