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Air Heaters	Sheath Materials	Max. Op Temper °F			al Max. ensities W/cm²	Page
Duct Heaters		'				
LDH SERIES and D SERIES	Alloy 840	1200	650	30	4.7	377
MDH SERIES	Alloy 840	1200	650	26	4.0	391
Finned						
375 Finned Strip	Aluminized steel	1100	595	33	5.1	395
FINBAR™ Single-Ended	304 stainless steel	1200	650	50	7.7	401
FIREROD® Cartridge	Alloy 800	Application	Specific	100	15.5	402
Enclosure Heaters		•				
WATROD™	Alloy 840	390	200	15	2.3	403
Silicone Rubber	Fiberglass reinforced silicone rubber	500	260	5	0.8	405
FLUENT® In-line	444 stainless steel (substrate tube), 316L stainless steel (baffle and fittings)	482 (internal)	250	150	23	408







Duct Heaters

LDH SERIES and D SERIES

Constructed of sturdy 0.430 in. (11 mm) diameter WATROD™ heating elements mounted to a ¹/₄ in. (6 mm) thick steel flange, duct heaters are easily adapted to many non-pressurized air-heating systems.

They are easily installed in applications requiring a wide range of temperature versus air flow combinations.

The modular duct heater offers increased reliability. The individual modules are removable through the housing of the assembly, which eliminates the need to pull the complete heater from the duct work. This reduces downtime costs because the heating elements can be replaced individually. Performance improvements include quicker response time and reduced infiltration from the air stream being heated into the electrical enclosure.

Watlow® duct heaters offer advantages over gas or oil fired and open coil electric units with:

- Installation flexibility—no flues or fuel lines
- 100 percent energy efficient—no energy loss up the flue
- Universal availability of electricity
- Resistance coil in sheath is protected from corrosive environments

Performance Capabilities

- Watt densities up to 40 W/in² (6.2 W/cm²)
- Recommended process temperatures from -20 to 1200°F (-29 to 650°C)
- Catalog P/N wattages up to 225kW
- Voltages up to 600VAC

Features and Benefits

Long life alloy 840 sheath

 Resists corrosion/oxidation while protecting resistance coils against contamination

MgO insulation filled elements compacted to rock hard density

· Maximizes dielectric strength, heat transfer and life

Field replaceable heating elements

 Permits easy service and reduces downtime. Element change-out is made simple by a single screw clamp (D SERIES only)

3¹/₂ in. (90 mm) thick mineral insulation

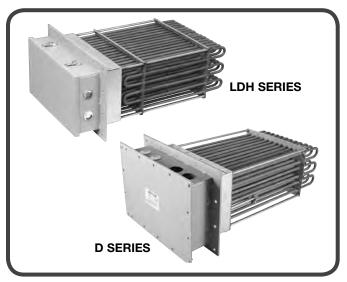
Keeps wiring cooler and reduces heat loss

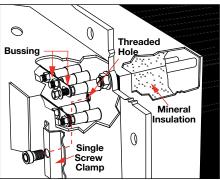
Silicone resin seals rated to 221°F (105°C)

Protects elements against moisture and other contaminants

General purpose terminal enclosure

· Offers easy access to wiring





¹/₄ in. (6 mm) inside diameter thermowell

 Accepts an optional Type J or K thermocouple for accurate sheath temperature sensing (D SERIES only)

Rigid stainless steel supports

Prevents element sagging or deformation in various mounting positions

1/4 in. (6 mm) thick steel flange with 3/8 in. (9.5 mm) diameter mounting holes

Easily bolts to the duct wall

WATROD hairpins are repressed (recompacted) after bending to assure MgO density

• Eliminates hot spots and electrical insulation voids

Stock heaters feature from three to 60 elements

· Meets a wide variety of kilowatt demands

One or three phase voltages

Meets local power supplies

Maximum 48 amperes per circuit

• Complies with National Electrical Code (NEC)

Duct heaters with general purpose enclosures meet UL® and CSA component recognition to 480 and 600VAC maximum respectively—UL® and CSA file numbers are E52951 and 31388



Duct Heaters

LDH SERIES and D SERIES

Typical Applications

- Drying ovens
- Autoclaves
- Furnaces
- Load banks
- Heat treating
- Reheating
- HVAC
- Paint drying

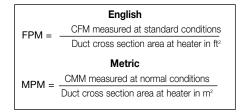
Choosing a Duct Heater

The English and metric graphs, shown on the following pages, will help you to select the correct duct heater. These graphs include: Watt Density vs. Air Temperature/Velocity, Watt Density vs. Sheath Temperature and Pressure Drop vs. Air Velocity.

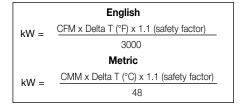
These graphs, with the quick formulas on this page, along with information specific to your application, will determine the correct duct heater specifications. However, if engineering assistance is needed, contact your Watlow representative.

Required Application Information

- Desired outlet air temperature
- Inlet air temperature
- Delta T—the temperature difference between inlet and desired outlet temperature
- Air volume (CFM/CMM) measured at both inlet temperature and pressure
- Air velocity in feet per minute (FPM); meters per minute (MPM) which equals:



 Minimum duct heater wattage (kW). This can be determined by:



Note: The duct heater, or combination of duct heaters, used for the process should be equal to or exceed the minimum wattage calculation.

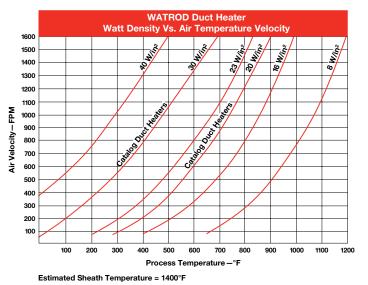


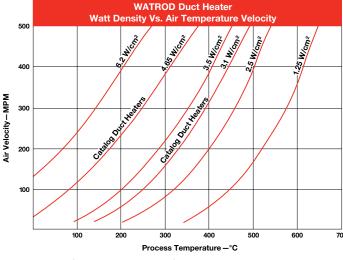
Duct Heaters

LDH SERIES and D SERIES

Watt Density vs. Air Temperature/Velocity

To decide watt density requirements, first determine the desired outlet air temperature and velocity in feet per minute. Then, follow the lines on the graph for velocity and process temperature to the watt density curve's intersecting point. This shows the recommended watt density based on a maximum sheath temperature of 1400°F (760°C). For longer heater life, lower watt densities should be chosen.

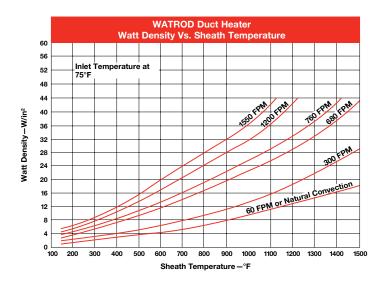


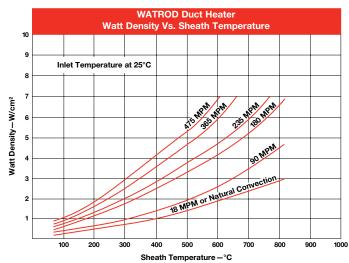


Estimated Sheath Temperature = 760°C

Watt Density vs. Sheath Temperature

The Watt Density vs. Sheath Temperature graph shows the air velocity (FPM or MPM) required to operate a WATROD duct heater at specific watt densities or sheath temperatures. Also depicted is the appropriate watt density vs. sheath temperature at a specified air flow.







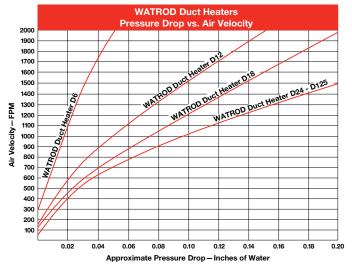
Duct Heaters

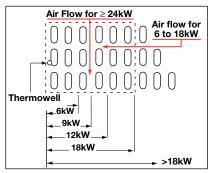
LDH SERIES and D SERIES

Pressure Drop vs. Air Velocity

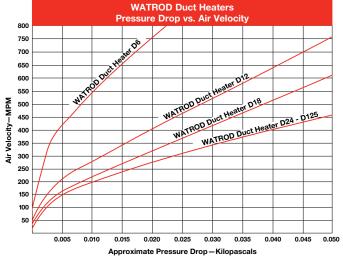
The rate at which pressure drops through the duct heater is critical for properly sizing blowers and pumps. *The Pressure Drop vs. Air Velocity* graph gives recommended maximum velocities in feet per minute and meters per minute according to the air velocity and duct heater size.

To determine the pressure drop through the duct heater, follow the air velocity (FPM or MPM) over to the appropriate curve, which identifies the duct heater size. Then, take the intersecting point down to the approximate pressure drop value.





Note: Viewing from the element ends—the recommended air flow direction through element bundle changes at >18kW.



Options

WATCONNECT® Standard Control Panels



WATCONNECT® standard control panels are configured to work with Watlow's duct heaters. They are quickly configured for process heating applications and delivered within two weeks. WATCONNECT panels integrate Watlow's high-quality heater, sensor,

temperature controller and power controller products for a complete thermal solution. Normally, competitive custom panels require significantly longer lead times. The broad range of standard features allow customers to quickly configure panels for each process heater included in this catalog.

Features and Benefits

Lead times of two weeks or less

• Provides faster delivery than competition

Full documentation provided for WATCONNECT control panels at the time of quotation

• Eliminates lengthy approval process and phone calls

Incorporates Watlow's temperature and power controllers

Provides a turnkey solution for process heating applications

Range of standard input/output (I/O) options

 Provides the user with a higher level of monitoring and control assuring an efficient and safe operation

WATCONNECT enclosure easily mounts to wall or frame

• Decreases installation time



Duct Heaters

LDH SERIES and D SERIES

Options (Continued)

Note: The WATCONNECT part number associated with a heater is only a suggestion. The following installation details need to be compared to panel capabilities to assure a compatible match:

- Minimum and maximum ambient temperature where panel will be installed
- Statutory and regulatory requirements at installation site
- · Sun loading, if any, at installation site
- Presence of any hazardous gases, dusts or fibers, if any
- · Verification of process sensor type
- Verification of limit sensor type
- Input/Output (I/O) requirements

For additional product information see the WATCONNECT landing page at www.watlow.com/watconnect. On the WATCONNECT landing page you will find a complete specification sheet along with other tools to help you properly select your control panel. If you would like to know the specific configuration of a WATCONNECT part number, please use the Product Configuration Lookup Tool on Watlow.com.

Wattages/Voltages

To meet specific application needs, voltage and wattage combinations outside stock product parameters are available.

For more information about this option, contact your Watlow representative.

Terminal Enclosures

In addition to the standard, general purpose terminal enclosure, Watlow offers a moisture resistant optional terminal enclosure to meet specific application requirements.

Thermocouples

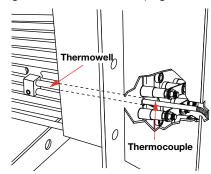
Type J or **K** thermocouples, inserted in the thermowell, accurately sense element sheath temperature for over-temperature conditions.

To sense process temperature, the sensing element should be located downstream from the duct heater. This will eliminate incorrect sensing caused by radiant heat.

Thermocouples are supplied with 120 in. (3050 mm) leads, longer lead lengths are available (this applies to "D" SERIES only). Unless otherwise specified, thermocouples are supplied with temperature ranges detailed on the *Thermocouple Types* chart.

Using a thermocouple requires an appropriate temperature and power controller. These must be purchased separately. Watlow offers a wide variety of temperature and power controllers to meet virtually all applications. Temperature controllers can be configured to accept process variable inputs, too. Contact your Watlow representative for details.

To order a thermocouple, add the appropriate suffix letter to the duct heater's base part number, as indicated on the *Ordering Information* chart on page 390.



Duct heater thermowell holds thermocouple for sensing sheath temperature.

Thermocouple Types

ASTM	Conductor C	haracteristics		nmended ^① ature Range
Туре	Positive	Negative	°F	(°C)
J	Iron	Constantan	0 to 1000	(-20 to 540)
	(Magnetic)	(Non-magnetic)		
K	Chromel®	Alumel®	0 to 2000	(-20 to 1100)
	(Non-magnetic)	(Magnetic)		

①Type J and Type K thermocouples are rated 32 to 1382°F and 32 to 2282°F (0-750°C and 0-1250°C), respectively. Watlow does not recommend exceeding temperature ranges shown on this chart for the tubular product line.

Application Hints

- Mount duct heaters horizontally to lower enclosure temperatures and promote unit life.
- Orient heating elements as per the air flow illustration on page 380.
- Promote heater life by keeping sheath temperature below the 1400°F (760°C) maximum.
- Measure process temperature in the outlet stream, away from the heater.
- Maintain wiring integrity by keeping enclosure temperature below 400°F (205°C).
- Thermal cycling can cause terminations to loosen.
 Periodically check and tighten all electrical connections.
- Size power feeder wires in accordance with NEC and other applicable codes.
- Protect employees against electrical shock by properly grounding the unit per NEC specifications.

Extended Capabilities for Duct Heaters



Performance Capabilities

• Wattages to 2.2 megawatts

Features and Benefits

Ceramic fiber insulation available

• Keeps wiring cooler and reduces heat loss

Greater than ¹/₄ in. (6 mm) with 304 or 316 stainless steel flange material

• Easily bolts to the duct wall

60 plus element designs available

• Meets a wide variety of kilowatt demands

Options

Sheath Material

Watlow duct heaters can be made with the following sheath materials:

- 304, 316, 321 SS
- Alloy 800
- Laminated alloy 600 (hi-temp)
- Hastelloy C276

Contact your Watlow representative for details and availability.

Terminal Enclosures

In addition to the standard, general purpose terminal enclosure, Watlow offers the following optional terminal enclosures to meet specific application requirements:

- Explosion resistant (contact your Watlow representative)
- High-temperature stand-off enclosures

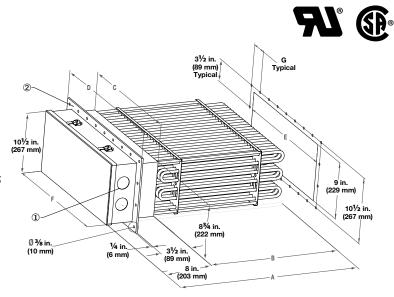


Duct Heaters

LDH SERIES

Application: High Temperature Air 800°F (427°C)

- Welded alloy 840 WATROD elements
- Without thermostat
- General purpose enclosure
- Steel flange
- ① 3 and 6 element heaters have (1) 1 inch NPT conduit opening; 9, 12 and 15 element heaters have (2) 1 inch NPT conduit openings; 18 element heaters have (2) 1½ inch NPT conduit openings; 21 element (B= 20½ in.) heaters have (2) 1½ inch NPT conduit openings; remaining 21 and 24 element heaters have (3) 1½ inch NPT conduit openings
- 2 All flanges are 12 inches wide



# of				#	Part	WATCO	INECT P/N		"A" Dim.	"B" Dim.	"C" Dim.	"D" Dim.	"E" Dim.	"F" Dim.	"G" Dim.
_	Volts				Number	J T/C	K T/C	lbs (kg)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
20 V	N/in ²	(3.1 W	//cr	n²)											
3	240	9.0	1	1	LDH9S10S	C/F	C/F	55 (25)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	3 ³ /4 (95)	7 ¹ /2 (191)	4 (102)	4 ⁵ /8 (117.5)	3 (76)
3	240	9.0	3	1	LDH9S3S	C2-50	C2-92	55 (25)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	3 ³ /4 (95)	7 ¹ /2 (191)	4 (102)	4 ⁵ /8 (117.5)	3 (76)
3	480	9.0	1	1	LDH9S11S	C/F	C/F	55 (25)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	3 ³ /4 (95)	7 ¹ /2 (191)	4 (102)	4 ⁵ /8 (117.5)	3 (76)
3	480	9.0	3	1	LDH9S5S	C2-43	C2-35	55 (25)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	3 ³ /4 (95)	7 ¹ /2 (191)	4 (102)	4 ⁵ /8 (117.5)	3 (76)
6	240	18.0	1	2	LDH18S10S	C/F	C/F	65 (30)	28 ¹ /4 (718)	20 ¹ /4 (514)	6 ³ /4 (171)	10 ¹ / ₂ (267)	7 (178)	7 ⁵ /8 (193.7)	3 (76)
6	240	18.0	3	1	LDH18S3S	C2-236	C2-214	65 (30)	28 ¹ /4 (718)	20 ¹ /4 (514)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	7 ⁵ /8 (193.7)	3 (76)
6	480	18.0	1	1	LDH18S11S	C/F	C/F	65 (30)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	6 ³ /4 (171)	10 ¹ / ₂ (267)	7 (178)	7 ⁵ /8 (193.7)	3 (76)
6	480	18.0	3	1	LDH18S5S	C2-43	C2-35	65 (30)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	6 ³ /4 (171)	10 ¹ / ₂ (267)	7 (178)	7 ⁵ /8 (193.7)	3 (76)
9	240	27.0	1	3	LDH27S10S	C/F	C/F	120 (55)	28 ¹ / ₄ (718)	20 ¹ /4 (514)	9 ³ /4 (248)	13 ¹ / ₂ (343)	10 (254)	10 ⁵ /8 (269.9)	3 (76)
9	240	27.0	3	3	LDH27S3S	C4-143	C4-142	120 (55)	28 ¹ /4 (718)	20 ¹ /4 (514)	93/4 (248)	13 ¹ / ₂ (343)	10 (254)	10 ⁵ /8 (269.9)	3 (76)
9	480	27.0	1	3	LDH27S11S	C/F	C/F	120 (55)	28 ¹ /4 (718)	20 ¹ /4 (514)	93/4 (248)	13 ¹ / ₂ (343)	10 (254)	10 ⁵ /8 (269.9)	3 (76)
9	480	27.0	3	1	LDH27S5S	C2-225	C2-226	120 (55)	28 ¹ / ₄ (718)	20 ¹ /4 (514)	93/4 (248)	13 ¹ / ₂ (343)	10 (254)	10 ⁵ /8 (269.9)	3 (76)
12	240	36.0	1	4	LDH36S10S	C/F	C/F	135 (62)	28 ¹ /4 (718)	20 ¹ /4 (514)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	13 ⁵ /8 (346.1)	3 (76)
12	240	36.0	3	2	LDH36S3S	C2-218	C2-224	135 (62)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	12 ³ /4 (324)	16 ¹ / ₂ (419)	13 (330)	13 ⁵ /8 (346.1)	3 (76)
12	480	36.0	1	2	LDH36S11S	C/F	C/F	135 (62)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	13 ⁵ /8 (346.1)	3 (76)
12	480	36.0	3	1	LDH36S5S	C2-225	C2-226	135 (62)	28 ¹ /4 (718)	20 ¹ /4 (514)	12 ³ /4 (324)	16 ¹ / ₂ (419)	13 (330)	13 ⁵ /8 (346.1)	3 (76)
15	240	45.0	3	5	LDH45S3S	C4-144	C4-145	195 (89)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	15 ³ /4 (400)	19 ¹ / ₂ (495)	16 (406)	17 ⁷ /8 (454.0)	3 (76)
15	480	45.0	1	3	LDH45S11S	C/F	C/F	195 (89)	28 ¹ /4 (718)	20 ¹ /4 (514)	15 ³ /4 (400)	19 ¹ / ₂ (495)	16 (406)	17 ⁷ /8 (454.0)	3 (76)
15	480	45.0	3	5	LDH45S5S	C4-150	C4-151	195 (89)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	15 ³ /4 (400)	19 ¹ / ₂ (495)	16 (406)	17 ⁷ /8 (454.0)	3 (76)
18	240	54.0	3	3	LDH54S3S	C4-144	C4-145	205 (93)	28 ¹ /4 (718)	20 ¹ /4 (514)	18 ³ /4 (476)	22 ¹ / ₂ (572)	19 (483)	20 ⁷ /8 (530.2)	3 (76)
18	480	54.0	1	3	LDH54S11S	C/F	C/F	205 (93)	28 ¹ /4 (718)	20 ¹ / ₄ (514)	18 ³ /4 (476)	22 ¹ / ₂ (572)	19 (483)	20 ⁷ /8 (530.2)	3 (76)
18	480	54.0	3	2	LDH54S5S	C2-229	C2-230	205 (93)	28 ¹ /4 (718)	20 ¹ /4 (514)	18 ³ /4 (476)	22 ¹ / ₂ (572)	19 (483)	20 ⁷ /8 (530.2)	3 (76)
21	240	63.0	3	7	LDH63S3S	C4-148	C4-149	235 (107)	28 ¹ /4 (718)	20 ¹ /4 (514)	21 ³ /4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	63.0	1	3	LDH63S11S	C/F	C/F	235 (107)	28 ¹ / ₄ (718)	20 ¹ / ₄ (514)	21 ³ /4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	63.0	3	7	LDH63S5S	C4-154	C4-155	235 (107)	28 ¹ / ₄ (718)	20 ¹ / ₄ (514)	213/4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	240	79.0	3	7	LDH79S3S	C/F	C/F	260 (118)	33 (838)	25 (635)	21 ³ /4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	79.0	1	7	LDH79S11S	C/F	C/F	260 (118)	33 (838)	25 (635)	21 ³ /4 (552)	25 ¹ /2 (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	79.0	3	7	LDH79S5S	C4-156	C4-157	260 (118)	33 (838)	25 (635)	213/4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	240	105.0	3	7	LDH105S3S	C/F	C/F	290 (132)	40 ¹ /2(1029)	32 ¹ / ₂ (826)	21 ³ /4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	105.0	1	7	LDH105S11S	C/F	C/F	290 (132)	401/2(1029)	32 ¹ / ₂ (826)	213/4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	105.0	3	7	LDH105S5S	C4-156	C4-157	290 (132)	40 ¹ /2(1029)	32 ¹ / ₂ (826)	21 ³ /4 (552)	25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
21	480	131.0	3	7	LDH131S5S	C4-156	C4-157					25 ¹ / ₂ (648)	22 (559)	23 ⁷ /8 (606.4)	3 (76)
24	480	150.0	3	4	LDH150S5S	C4-156	C4-157	330 (150)	49 ¹ /2(1257)	41 ¹ / ₂ (1054	24 ³ /4 (629)	28 ¹ / ₂ (724)	25 (635)	26 ⁷ /8 (682.6)	3 (76)
Note															

Notes:

C/F - Contact factory, go to www.watlow.com/en/contact-us



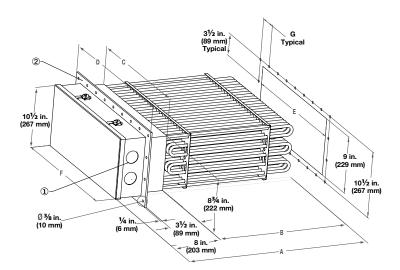
[•] See Watt Density vs. Air Temperature/Velocity charts on page 379 to confirm suitability in the application.

Duct Heaters

LDH SERIES

Application: Medium Temperature Air 750°F (399°C)

- Welded alloy 840 WATROD elements
- Without thermostat
- General purpose enclosure
- Steel flange
- ① 3 and 6 element heaters have (1) 1 inch NPT conduit opening; 9, 12 and 15 element heaters have (2) 1 inch NPT conduit openings; 18 element heaters have (2) 1½ inch NPT conduit openings; 21 element (B= 20½ in.) heaters have (2) 1½ inch NPT conduit openings; remaining 21 and 24 element heaters have (3) 1½ inch NPT conduit openings
- 2 All flanges are 12 inches wide



# of				#	Part	WATCON	NECT P/N	Ship	Wt.	"A" I	Dim.	"B"	Dim.	"C" Dim.	"D"	Dim.	"E" Dim.	"F'	' Dim.	"G"	Dim.
		kW			Number	J T/C	K T/C	lbs.	(kg)	in. (mm)	in. ((mm)	in. (mm)	in.	(mm)	in. (mm)	in.	(mm)	in.	(mm)
30 W	//in ²	(4.7 W	/cn	n²)																	
3	240	14.0	1	3	LDH14SX10S	C/F	C/F	55	(25)	281/4	(718)	20 ¹ /4	(514)	3 ³ /4 (95)	71/2	(191)	4 (102)	4 ⁵ /8	(117.5)	3	(76)
3	240	14.0	3	1	LDH14SX3S	C2-236	C2-214	55	(25)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	3 ³ /4 (95)	71/2	(191)	, ,		(117.5)		(76)
3	480	14.0	1	1	LDH14SX11S	C/F	C/F	55	(25)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	3 ³ /4 (95)	71/2	(191)	4 (102)	4 ⁵ /8	(117.5)	3	(76)
3	480	14.0	3	1	LDH14SX5S	C2-43	C2-35	55	(25)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	33/4 (95)	71/2	(191)	4 (102)	4 ⁵ /8	(117.5)	3	(76)
6	240	27.0	1	3	LDH27SX10S	C/F	C/F	65	(30)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	6 ³ /4(171)	10 ¹ /2	(267)	7 (178)	7 ⁵ /8	(193.7)	3	(76)
6	240	27.0	3	2	LDH27SX3X	C2-218	C2-224	65	(30)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	6 ³ /4(171)	10 ¹ /2	(267)	7 (178)	7 ⁵ /8	(193.7)	3	(76)
6	480	27.0	1	2	LDH27SX11S	C/F	C/F	65	(30)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	6 ³ /4(171)	10 ¹ /2	(267)	7 (178)	7 ⁵ /8	(193.7)	3	(76)
6	480	27.0	3	1	LDH27SX5S	C2-225	C2-226	65	(30)	281/4	(718)	20 ¹ / ₄	(514)	6 ³ /4(171)	10 ¹ /2	(267)	7 (178)	7 ⁵ /8	(193.7)	3	(76)
9	240	41.0	3	3	LDH41SX3S	C4-144	C4-145	120	(55)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	93/4(248)	13 ¹ /2	(343)	10 (254)	10 ⁵ /8	(269.9)	3	(76)
9	480	41.0	1	3	LDH41SX11S	C/F	C/F	120	(55)	281/4	(718)	20 ¹ / ₄	(514)	93/4(248)	13 ¹ /2	(343)	10 (254)	10 ⁵ /8	(269.9)	3	(76)
9	480	41.0	3	3	LDH41SX5S	C4-150	C4-151	120	(55)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	93/4(248)	13 ¹ /2	(343)	10 (254)	10 ⁵ /8	(269.9)	3	(76)
12	240	54.0	3	4	LDH54SX3S	C4-148	C4-149	135	(62)	281/4	(718)	20 ¹ / ₄	(514)	12 ³ /4(324)	16 ¹ /2	(419)	13 (330)	13 ⁵ /8	(346.1)	3	(76)
12	480	54.0	1	3	LDH54SX11S	C/F	C/F	135	(62)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	12 ³ /4(324)	16 ¹ /2	(419)	13 (330)	13 ⁵ /8	(346.1)	3	(76)
12	480	54.0	3	2	LDH54SX5S	C2-229	C2-230	135	(62)	281/4	(718)	20 ¹ / ₄	(514)	123/4(324)	16 ¹ /2	(419)	13 (330)	13 ⁵ /8	(346.1)	3	(76)
15	240	68.0	3	5	LDH68SX3S	C/F	C/F	195	(89)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	15 ³ /4(400)	19 ¹ /2	(495)	16 (406)	17 ⁷ /8	(454.0)	3	(76)
15	480	68.0	1	3	LDH68SX11S	C/F	C/F	195	(89)	281/4	(718)	20 ¹ / ₄	(514)	15 ³ /4(400)	19 ¹ /2	(495)	16 (406)	17 ⁷ /8	(454.0)	3	(76)
15	480	68.0	3	5	LDH68SX5S	C4-152	C4-153	195	(89)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	15 ³ /4(400)	19 ¹ /2	(495)	16 (406)	17 ⁷ /8	(454.0)	3	(76)
18	240	80.0	3	6	LDH80SX3S	C/F	C/F	205	(93)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	18 ³ /4(476)	22 ¹ /2	(572)	19 (483)	20 ⁷ /8	(530.2)	3	(76)
18	480	80.0	1	6	LDH80SX11S	C/F	C/F	205	(93)	281/4	(718)	20 ¹ / ₄	(514)	18 ³ /4(476)	22 ¹ /2	(572)	19 (483)	20 ⁷ /8	(530.2)	3	(76)
18	480	80.0	3	3	LDH80SX5S	C4-152	C4-153	205	(93)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	18¾(476)	22 ¹ /2	(572)	19 (483)	20 ⁷ /8	(530.2)	3	(76)
21	240	95.0	3	7	LDH95SX3S	C/F	C/F	235	(107)	281/4	(718)	20 ¹ /4	(514)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	480	95.0	1	7	LDH95SX11S	C/F	C/F	235	(107)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	480	95.0	3	7	LDH95SX5S	C4-156	C4-157	235	(107)	28 ¹ / ₄	(718)	20 ¹ /4	(514)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	240	120.0	3	7	LDH120SX3S	C/F	C/F	260	(118)	33	(838)	25	(635)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	480	120.0	1	7	LDH120SX11S	C/F	C/F	260	(118)	33	(838)	25	(635)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	480	120.0	3	7	LDH120SX5S	C4-156	C4-157	260	(118)	33	(838)	25	(635)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	480	160.0	3	7	LDH160SX5S	C/F	C/F	290	(132)	401/2((1029)	32 ¹ / ₂	(826)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
21	480	200.0	3	7	LDH200SX5S	C/F	C/F	310	(141)	49 ¹ /2((1257)	41 ¹ /2	(1054)	21 ³ /4(552)	25 ¹ /2	(648)	22 (559)	23 ⁷ /8	(606.4)	3	(76)
24	480	225.0	3	8	LDH225SX5S	C/F	C/F	330	(150)	491/2((1257)	41 ¹ /2	(1054)	24 ³ /4(629)	28 ¹ /2	(724)	25 (635)	26 ⁷ /8	(682.6)	3	(76)

Notes:

• See Watt Density vs. Air Temperature/Velocity charts on page 379 to confirm suitability in the application.

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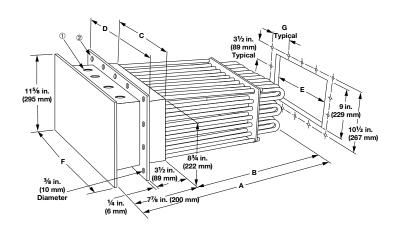


Duct Heaters

D SERIES

Application: High Temperature Air 800°F (427°C)

- Removable alloy 840 WATROD elements
- Without thermostat
- General purpose enclosure
- Steel flange
- ① 6 and 12 element heaters have (1) 1 inch NPT conduit opening; 18, 24, 30 and 42 element heaters have (2) 1 inch NPT conduit openings; 36, 48, 54 and 60 element heaters have (2) 1 inch NPT and (2) 11/4 inch conduit openings
- ② All flanges are 12 inches wide



# of Elem.	Volte	kW	Ph	# Circ	Part Number	WATCON	NECT P/N K T/C		p Wt. (kg)	"A" Dim. in. (mm)	"B" Dim. in. (mm)		"D" Dim. in. (mm)	"E" Dim.	"F" Dim. in. (mm)	
		3.1 W			Number	0 1/0	IK 170	103.	(N9)	111. (11111)	()	111. (11111)	III. (IIIII)	111. (111111)	III. (IIIII)	, III. (IIIII)
6	240	6.0	1	1	D6S10S	C/F	C/F	50	(23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ / ₂ (165)	3 (76)	53/4 (146)	21/2 (64)
6	240	6.0	3	1	D6S3S	C2-50	C2-92	50	(23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ / ₂ (165)	3 (76)	5 ³ /4 (146)	21/2 (64)
6	480	6.0	1	1	D6S11S	C/F	C/F	50	(23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ / ₂ (165)	3 (76)	5 ³ /4 (146)	21/2 (64)
6	480	6.0	3	1	D6S5S	C2-43	C2-35	50	(23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ / ₂ (165)	3 (76)	5 ³ /4 (146)	21/2 (64)
12	240	12.0	1	1	D12S10S	C/F	C/F	55	(25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ / ₂ (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
12	240	12.0	3	1	D12S3S	C2-236	C2-214	55	(25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ / ₂ (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
12	480	12.0	1	1	D12S11S	C/F	C/F	55	(25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ / ₂ (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
12	480	12.0	3	1	D12S5S	C2-43	C2-35	55	(25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ / ₂ (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
18	240	18.0	1	2	D18S10S	C/F	C/F	65	(30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	9 ³ /4 (248)	3 (76)
18	240	18.0	3	1	D18S3S	C2-236	C2-214	65	(30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	9 ³ /4 (248)	3 (76)
18	480	18.0	1	1	D18S11S	C/F	C/F	65	(30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	9 ³ /4 (248)	3 (76)
18	480	18.0	3	1	D18S5S	C2-43	C2-35	65	(30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	9 ³ /4 (248)	3 (76)
24	240	24.0	1	2	D24S10S	C/F	C/F	95	(43)	27 ⁷ /8 (708)	20 (508)	8 ³ /4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ /4(298)	2 ³ /4 (70)
24	240	24.0	3	2	D24S3S	C2-218	C2-224	95	(43)	27 ⁷ /8 (708)	20 (508)	8 ³ /4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ /4(298)	2 ³ /4 (70)
24	480	24.0	1	1	D24S11S	C/F	C/F	95	(43)	27 ⁷ /8 (708)	20 (508)	8 ³ /4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ /4(298)	2 ³ /4 (70)
24	480	24.0	3	1	D24S5S	C2-225	C2-226	95	(43)	27 ⁷ /8 (708)	20 (508)	8 ³ /4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ /4(298)	2 ³ /4 (70)
30	240	30.0	3	2	D30S3S	C2-218	C2-224	120	(55)	27 ⁷ /8 (708)	20 (508)	10 ³ /4 (273)	14 ¹ /2 (368)	11 (279)	13 ³ /4 (349)	31/4 (83)
30	480	30.0	1	2	D30S11S	C/F	C/F	120	(55)	27 ⁷ /8 (708)	20 (508)	10 ³ /4 (273)	14 ¹ /2 (368)	11 (279)	13 ³ /4(349)	31/4 (83)
30	480	30.0	3	1	D30S5S	C2-225	C2-226	120	(55)	27 ⁷ /8 (708)	20 (508)	10 ³ /4 (273)	14 ¹ /2 (368)	11 (279)	13 ³ /4(349)	3 ¹ /4 (83)
															CO	NTINUED

Notes

• See Watt Density vs. Air Temperature/Velocity charts on page 379 to confirm suitability in the application.

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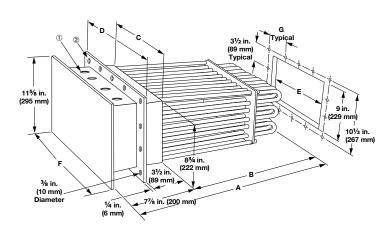
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Duct Heaters

D SERIES

Application: High Temperature Air 800°F (427°C)

- Removable alloy 840 WATROD elements
- Without thermostat
- General purpose enclosure
- Steel flange
- ① 6 and 12 element heaters have (1) 1 inch NPT conduit opening; 18, 24, 30 and 42 element heaters have (2) 1 inch NPT conduit openings; 36, 48, 54, and 60 element heaters have (2) 1 inch NPT and (2) 11/4 inch conduit openings
- 2 All flanges are 12 inches wide



# of				#	Part		NECT P/N	-	o Wt.		Dim.		Dim.	"C" Dim.	"D" Dim.			"G" Dim.
	Volts			Circ	Number	J T/C	K T/C	lbs.	(kg)	in.	(mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
20 W	//in² (3.1 W/	cm²	')										I		ı	1	
36	240	36.0	3	2	D36S3S	C2-218	C2-219	135	(62)	27 ⁷ /8	(708.0)	20	(508)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	15 ³ /4 (400)	3 ³ /4 (95)
36	480	36.0	1	2	D36S11S	C/F	C/F	135	(62)	27 ⁷ /8	(708.0)	20	(508)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	15 ³ /4 (400)	3 ³ /4 (95)
36	480	36.0	3	1	D36S5S	C2-225	C2-226	135	(62)	27 ⁷ /8	(708.0)	20	(508)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	15 ³ /4 (400)	3 ³ /4 (95)
42	240	42.0	3	2	D42S3S	C/F	C/F	155	(71)	27 ⁷ /8	(708.0)	20	(508)	14 ³ /4 (375)	18 ¹ /2 (470)	15 (381)	17 ³ /4 (451)	4 ¹ /4(108)
42	480	42.0	1	2	D42S11S	C/F	C/F	155	(71)	27 ⁷ /8	(708.0)	20	(508)	14 ³ /4 (375)	18 ¹ /2 (470)	15 (381)	17 ³ /4 (451)	4 ¹ /4(108)
42	480	42.0	3	2	D42S5S	C2-229	C2-230	155	(71)	27 ⁷ /8	(708.0)	20	(508)	14 ³ /4 (375)	18 ¹ / ₂ (470)	15 (381)	17 ³ /4 (451)	4 ¹ /4(108)
48	240	48.0	3	4	D48S3S	C4-148	C4-149	195	(89)	27 ⁷ /8	(708.0)	20	(508)	16 ³ /4 (425)	20 ¹ /2 (521)	17 (432)	19 ³ /4 (502)	4 ³ /4(121)
48	480	48.0	1	2	D48S11S	C/F	C/F	195	(89)	27 ⁷ /8	(708.0)	20	(508)	16 ³ /4 (425)	20 ¹ /2 (521)	17 (432)	19 ³ /4 (502)	4 ³ /4(121)
48	480	48.0	3	2	D48S5S	C2-229	C2-230	195	(89)	27 ⁷ /8	(708.0)	20	(508)	16 ³ /4 (425)	20 ¹ /2 (521)	17 (432)	19 ³ /4 (502)	4 ³ /4(121)
54	240	54.0	3	3	D54S3S	C4-144	C4-145	205	(93)	27 ⁷ /8	(708.0)	20	(508)	18 ³ /4 (476)	22 ¹ /2 (572)	19 (483)	21 ³ /4 (552)	5 ¹ /4(133)
54	480	54.0	1	3	D54S11S	C/F	C/F	205	(93)	27 ⁷ /8	(708.0)	20	(508)	18 ³ /4 (476)	22 ¹ /2 (572)	19 (483)	21 ³ /4 (552)	5 ¹ /4(133)
54	480	54.0	3	2	D54S5S	C2-229	C2-230	205	(93)	27 ⁷ /8	(708.0)	20	(508)	18 ³ /4 (476)	22 ¹ /2 (572)	19 (483)	21 ³ /4 (552)	5 ¹ /4(133)
60	240	60.0	3	4	D60S3S	C4-148	C4-149	235	(107)	27 ⁷ /8	(708.0)	20	(508)	203/4 (527)	24 ¹ /2 (622)	21 (533)	233/4 (603)	5 ³ /4(146)
60	480	60.0	1	4	D60S11S	C/F	C/F	235	(107)	27 ⁷ /8	(708.0)	20	(508)	203/4 (527)	24 ¹ /2 (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
60	480	60.0	3	2	D60S5S	C2-229	C2-230	235	(107)	27 ⁷ /8	(708.0)	20	(508)	203/4 (527)	24 ¹ /2 (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
60	240	75.0	3	4	D75S3S	C4-148	C4-149	260	(118)	32 ⁷ /8	(835.0)	25	(635)	203/4 (527)	24 ¹ /2 (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
60	480	75.0	1	4	D75S11S	C/F	C/F	260	(118)	32 ⁷ /8	(835.0)	25	(635)	20 ³ /4 (527)	24 ¹ /2 (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
60	480	75.0	3	2	D75S5S	C2-229	C2-230	260	(118)	32 ⁷ /8	(835.0)	25	(635)	203/4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
60	480	100.0	3	4	D100S5S	C4-156	C4-157	290	(132)	40 ³ /8	(1025.5)	32 ¹ / ₂	(826)	20 ³ /4 (527)	241/2 (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
60	480	125.0	3	4	D125S5S	C4-156	C4-157	310	(141)	49 ³ /8	(1254.1)	41 ¹ /2	(1054)	203/4 (527)	24 ¹ /2 (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)

Notes:

• See Watt Density vs. Air Temperature/Velocity charts on page 379 to confirm suitability in the application.

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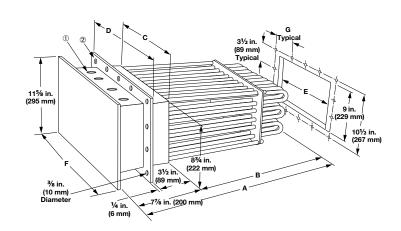


Duct Heaters

D SERIES

Application: Medium Temperature Air 750°F (399°C)

- Removable alloy 840 WATROD elements
- Without thermostat
- General purpose enclosure
- Steel flange
- ① 6 and 12 element heaters have (1) 1 inch NPT conduit opening; 18, 24, 30 and 42 element heaters have (2) 1 inch NPT conduit openings; 36, 48, 54, and 60 element heaters have (2) 1 inch NPT and (2) 11/4 inch conduit openings
- 2 All flanges are 12 inches wide



# of	Volts	kW	Dh	# Circ	Part Number	WATCON J T/C	NECT P/N K T/C	Ship Wilbs. (kg		"B" Dim. in. (mm)	"C" Dim. in. (mm)	"D" Dim. in. (mm)	"E" Dim. in. (mm)	"F" Dim. in. (mm)	"G" Dim. in. (mm)
	//in² (4				reamber	0 1/0	10 170	ibo. (Re	, (<u>,</u>	()	III. (IIIII)			III. (IIIII)	()
6	240	9.0	1	1	D6SX10S	C/F	C/F	50 (23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ /2 (165)	3 (76)	53/4 (146)	21/2 (64)
6	240	9.0	3	1	D6SX3S	C2-50	C2-92	50 (23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ /2 (165)	3 (76)	5 ³ /4 (146)	21/2 (64)
6	480	9.0	1	1	D6SX11S	C/F	C/F	50 (23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ /2 (165)	3 (76)	5 ³ /4 (146)	21/2 (64)
6	480	9.0	3	1	D6SX5S	C2-43	C2-35	50 (23)	27 ⁷ /8 (708)	20 (508)	23/4 (70)	6 ¹ /2 (165)	3 (76)	5 ³ /4 (146)	21/2 (64)
12	240	18.0	1	2	D12SX10S	C/F	C/F	55 (25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ /2 (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
12	240	18.0	3	1	D12SX3S	C2-236	C2-214	55 (25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ /2 (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
12	480	18.0	1	1	D12SX11S	C/F	C/F	55 (25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ /2 (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
12	480	18.0	3	1	D12SX5S	C2-43	C2-35	55 (25)	27 ⁷ /8 (708)	20 (508)	4 ³ /4 (121)	8 ¹ /2 (215)	5 (127)	7 ³ /4 (197)	31/2 (89)
18	240	27.0	1	3	D18SX10S	C/F	C/F	65 (30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	93/4 (248)	3 (76)
18	240	27.0	3	2	D18SX3S	C2-218	C2-224	65 (30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	93/4 (248)	3 (76)
18	480	27.0	1	2	D18SX11S	C/F	C/F	65 (30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	93/4 (248)	3 (76)
18	480	27.0	3	1	D18SX5S	C2-225	C2-226	65 (30)	27 ⁷ /8 (708)	20 (508)	6 ³ /4 (171)	10 ¹ /2 (267)	7 (178)	93/4 (248)	3 (76)
24	240	36.0	1	4	D24SX10S	C/F	C/F	95 (43)	27 ⁷ /8 (708)	20 (508)	83/4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ / ₄ (298)	2 ³ /4 (70)
24	240	36.0	3	2	D24SX3S	C2-218	C2-219	95 (43)	27 ⁷ /8 (708)	20 (508)	83/4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ / ₄ (298)	23/4 (70)
24	480	36.0	1	2	D24SX11S	C/F	C/F	95 (43)	27 ⁷ /8 (708)	20 (508)	83/4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ / ₄ (298)	23/4 (70)
24	480	36.0	3	1	D24SX5S	C2-225	C2-226	95 (43)	27 ⁷ /8 (708)	20 (508)	83/4 (222)	12 ¹ /2 (318)	9 (229)	11 ³ / ₄ (298)	23/4 (70)
30	240	45.0	3	5	D30SX3S	C4-144	C4-145	120 (55)	27 ⁷ /8 (708)	20 (508)	103/4 (273)	14 ¹ /2 (368)	11 (279)	13 ³ / ₄ (349)	31/4 (83)
30	480	45.0	1	2	D30SX11S	C/F	C/F	120 (55)	27 ⁷ /8 (708)	20 (508)	103/4 (273)	14 ¹ /2 (368)	11 (279)	13 ³ / ₄ (349)	31/4 (83)
30	480	45.0	3	2	D30SX5S	C2-229	C2-230	120 (55)	27 ⁷ /8 (708)	20 (508)	10 ³ /4 (273)	14 ¹ /2 (368)	11 (279)	13 ³ /4 (349)	31/4 (83)

CONTINUED

Notes:

• See Watt Density vs. Air Temperature/Velocity charts on page 379 to confirm suitability in the application.

C/F - Contact factory, go to www.watlow.com/en/contact-us



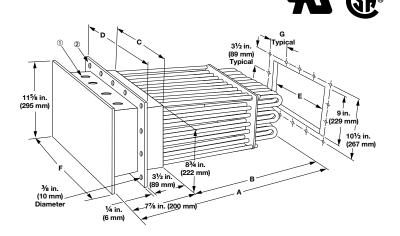


Duct Heaters

D SERIES

Application: Medium Temperature Air 750°F (399°C)

- Removable alloy 840 WATROD elements
- Without thermostat
- General purpose enclosure
- Steel flange
- ① 6 and 12 element heaters have (1) 1 inch NPT conduit opening; 18, 24, 30 and 42 element heaters have (2) 1 inch NPT conduit openings; 36, 48, 54, and 60 element heaters have (2) 1 inch NPT and (2) 11/4 inch conduit openings
- 2 All flanges are 12 inches wide



Volts	I-VA/					NECT P/N				Dim.		Dim.	"C" Dim.	"D" Dim.	E Dim.	"F" Dim.	"G" Dim.
	KW	Ph	Circ	Number	J T/C	K T/C	lbs.	(kg)	in.	(mm)	in. ((mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
/in² (4.7 W	/cm	²)														
240	54.0	3	3	D36SX3S	C4-144	C4-145	135	(62)	27 ⁷ /8	(708.0)	20	(508)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	15 ³ /4 (400)	3 ³ /4 (95)
480	54.0	1	3	D36SX11S	C/F	C/F	135	(62)	27 ⁷ /8	(708.0)	20	(508)	12 ³ /4 (324)	16 ¹ /2 (419)	13 (330)	15 ³ /4 (400)	3 ³ /4 (95)
480	54.0	3	2	D36SX5S	C2-229	C2-230	135	(62)	27 ⁷ /8	(708.0)	20	(508)	12 ³ /4 (324)	16 ¹ / ₂ (419)	13 (330)	15 ³ /4 (400)	3 ³ /4 (95)
240	63.0	3	7	D42SX3S	C4-148	C4-149	155	(71)	27 ⁷ /8	(708.0)	20	(508)	14 ³ /4 (375)	18 ¹ / ₂ (470)	15 (381)	17 ³ /4 (451)	4 ¹ /4(108)
480	63.0	1	3	D42SX11S	C/F	C/F	155	(71)	27 ⁷ /8	(708.0)	20	(508)	14 ³ /4 (375)	18 ¹ / ₂ (470)	15 (381)	17 ³ /4 (451)	4 ¹ /4(108)
480	63.0	3	2	D42SX5S	C2-229	C2-230	155	(71)	27 ⁷ /8	(708.0)	20	(508)	14 ³ /4 (375)	18 ¹ / ₂ (470)	15 (381)	17 ³ /4 (451)	4 ¹ /4(108)
240	72.0	3	4	D48SX3S	C4-148	C4-149	195	(89)	27 ⁷ /8	(708.0)	20	(508)	16 ³ /4 (425)	20 ¹ / ₂ (521)	17 (432)	19 ³ /4 (502)	4 ³ /4(121)
480	72.0	1	4	D48SX11S	C/F	C/F	195	(89)	27 ⁷ /8	(708.0)	20	(508)	16 ³ /4 (425)	20 ¹ / ₂ (521)	17 (432)	19 ³ /4 (502)	4 ³ /4(121)
480	72.0	3	2	D48SX5S	C2-229	C2-230	195	(89)	27 ⁷ /8	(708.0)	20	(508)	16 ³ /4 (425)	20 ¹ / ₂ (521)	17 (432)	19 ³ /4 (502)	4 ³ /4(121)
240	81.0	3	6	D54SX3S	C/F	C/F	205	(93)	27 ⁷ /8	(708.0)	20	(508)	18 ³ /4 (476)	22 ¹ / ₂ (572)	19 (483)	21 ³ /4 (552)	5 ¹ /4(133)
480	81.0	1	6	D54SX11S	C/F	C/F	205	(93)	27 ⁷ /8	(708.0)	20	(508)	18 ³ /4 (476)	22 ¹ / ₂ (572)	19 (483)	21 ³ /4 (552)	5 ¹ /4(133)
480	81.0	3	3	D54SX5S	C4-152	C4-153	205	(93)	27 ⁷ /8	(708.0)	20	(508)	18 ³ /4 (476)	22 ¹ / ₂ (572)	19 (483)	21 ³ /4 (552)	5 ¹ /4(133)
240	90.0	3	5	D60SX3S	C/F	C/F	235 ((107)	27 ⁷ /8	(708.0)	20	(508)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
480	90.0	1	4	D60SX11S	C/F	C/F	235 ((107)	27 ⁷ /8	(708.0)	20	(508)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
480	90.0	3	4	D60SX5S	C4-156	C4-157	235 ((107)	27 ⁷ /8	(708.0)	20	(508)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
240	115.0	3	10	D75SX3S	C/F	C/F	260 ((118)	32 ⁷ /8	(835.0)	25	(635)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	233/4 (603)	5 ³ /4(146)
480	115.0	1	5	D75SX11S	C/F	C/F	260 ((118)	32 ⁷ /8	(835.0)	25	(635)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
480	115.0	3	4	D75SX5S	C4-156	C4-157	260 ((118)	32 ⁷ /8	(835.0)	25	(635)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
480	150.0	3	4	D100SX5S	C4-156	C4-157	290 ((132)	40 ³ /8	(1025.5)	32 ¹ / ₂	(826)	20 ³ /4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
480	190.0	3	5	D125SX5S	C/F	C/F	310 ((141)	49 ³ /8	(1254.1)	41 ¹ /2	(1054)	203/4 (527)	24 ¹ / ₂ (622)	21 (533)	23 ³ /4 (603)	5 ³ /4(146)
	240 480 240 480 240 480 240 480 240 480 240 480 240 480 480 480 480 480 480	240 54.0 480 54.0 480 63.0 480 63.0 480 72.0 480 72.0 480 81.0 480 81.0 480 90.0 480 90.0 480 115.0 480 115.0	240 54.0 3 480 54.0 1 480 54.0 3 240 63.0 3 480 63.0 1 480 63.0 3 240 72.0 3 480 72.0 1 480 72.0 3 240 81.0 3 480 81.0 1 480 81.0 3 240 90.0 3 480 90.0 1 480 90.0 3 240 115.0 3 480 115.0 1 480 115.0 3 480 150.0 3	480 54.0 1 3 480 54.0 3 2 240 63.0 3 7 480 63.0 1 3 480 63.0 3 2 240 72.0 3 4 480 72.0 1 4 480 72.0 3 2 240 81.0 3 6 480 81.0 1 6 480 81.0 3 3 240 90.0 3 5 480 90.0 1 4 480 90.0 3 4 240 115.0 3 10 480 115.0 1 5 480 115.0 3 4 480 150.0 3 4	240 54.0 3 3 D36SX3S 480 54.0 1 3 D36SX11S 480 54.0 3 2 D36SX5S 240 63.0 3 7 D42SX3S 480 63.0 1 3 D42SX11S 480 63.0 3 2 D42SX5S 240 72.0 3 4 D48SX3S 480 72.0 1 4 D48SX11S 480 72.0 3 2 D48SX5S 240 81.0 3 6 D54SX3S 480 81.0 1 6 D54SX11S 480 81.0 3 3 D54SX5S 240 90.0 3 5 D60SX3S 480 90.0 1 4 D60SX11S 480 90.0 3 4 D60SX5S 240 115.0 3 10 D75SX3S 480	240 54.0 3 3 D36SX3S C4-144 480 54.0 1 3 D36SX11S C/F 480 54.0 3 2 D36SX5S C2-229 240 63.0 3 7 D42SX3S C4-148 480 63.0 1 3 D42SX11S C/F 480 63.0 3 2 D42SX5S C2-229 240 72.0 3 4 D48SX3S C4-148 480 72.0 3 2 D48SX3S C4-148 480 72.0 3 2 D48SX1S C/F 480 72.0 3 2 D48SX3S C/F 480 81.0 3 6 D54SX3S C/F 480 81.0 3 3 D54SX3S C/F 480 81.0 3 3 D54SX3S C/F 480 90.0 3 5 D60SX3S <td< td=""><td>240 54.0 3 3 D36SX3S C4-144 C4-145 480 54.0 1 3 D36SX11S C/F C/F 480 54.0 3 2 D36SX5S C2-229 C2-230 240 63.0 3 7 D42SX3S C4-148 C4-149 480 63.0 3 2 D42SX5S C2-229 C2-230 240 72.0 3 4 D48SX3S C4-148 C4-149 480 72.0 3 2 D48SX3S C4-148 C4-149 480 72.0 3 2 D48SX1S C/F C/F 480 72.0 3 2 D48SX5S C2-229 C2-230 240 81.0 3 6 D54SX3S C/F C/F 480 81.0 3 3 D54SX3S C/F C/F 480 90.0 3 5 D60SX3S C/F C/F <td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 480 54.0 1 3 D36SX11S C/F C/F 135 480 54.0 3 2 D36SX5S C2-229 C2-230 135 240 63.0 3 7 D42SX3S C4-148 C4-149 155 480 63.0 3 2 D42SX5S C2-229 C2-230 155 240 72.0 3 4 D48SX3S C4-148 C4-149 195 480 72.0 3 4 D48SX3S C4-148 C4-149 195 480 72.0 3 2 D48SX3S C4-148 C4-149 195 480 72.0 3 2 D48SX3S C/F C/F 195 480 72.0 3 2 D48SX3S C/F C/F 205 480 81.0 3 6 D54SX3S</td><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 480 54.0 1 3 D36SX11S C/F C/F 135 (62) 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 240 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 480 63.0 3 4 D48SX3S C4-148 C4-149 195 (89) 480 72.0 3 4 D48SX1S C/F C/F 195 (89) 480 72.0 3 2 D48SX5S C2-229 C2-230 195 (89) 480 72.0 3 6 D54SX3S<!--</td--><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 277/8 480 54.0 1 3 D36SX11S C/F C/F 135 (62) 277/8 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 277/8 240 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 277/8 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 277/8 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 277/8 240 72.0 3 4 D48SX3S C4-148 C4-149 195 (89) 277/8 480 72.0 1 4 D48SX11S C/F C/F C/F 195 (89) 277/8 480 72.0 3 2 D48SX3S</td><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 27⁷/8 (708.0) 480 54.0 1 3 D36SX11S C/F C/F 135 (62) 27⁷/8 (708.0) 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 27⁷/8 (708.0) 240 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 27⁷/8 (708.0) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 27⁷/8 (708.0) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 27⁷/8 (708.0) 480 72.0 3 4 D48SX11S C/F C/F 195 (89) 27⁷/8 (708.0) 480 72.0 3 2 D48SX5S C2-229 C2-230 195</td><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 27⁷/8 (708.0) 20 480 54.0 1 3 D36SX11S C/F C/F 135 (62) 27⁷/8 (708.0) 20 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 27⁷/8 (708.0) 20 240 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 27⁷/8 (708.0) 20 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 27⁷/8 (708.0) 20 480 63.0 3 4 D48SX3S C4-148 C4-149 195 (89) 27⁷/8 (708.0) 20 240 72.0 3 4 D48SX11S C/F C/F 195 (89) 27⁷/8 (708.0) 20 480 72.0</td><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 27⁷/8 (708.0) 20 (508) 480 54.0 1 3 D36SX51S C/F C/F C/F 135 (62) 27⁷/8 (708.0) 20 (508) 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 27⁷/8 (708.0) 20 (508) 480 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 27⁷/8 (708.0) 20 (508) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 27⁷/8 (708.0) 20 (508) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 27⁷/8 (708.0) 20 (508) 480 72.0 1 4 D48SX11S C/F C/F 195<</td><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 277/8 (708.0) 20 (508) 12³/4 (324) 480 54.0 1 3 D36SX11S C/F C/F 135 (62) 277/8 (708.0) 20 (508) 12³/4 (324) 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 277/8 (708.0) 20 (508) 12³/4 (324) 240 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 277/8 (708.0) 20 (508) 14³/4 (375) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 277/8 (708.0) 20 (508) 14³/4 (375) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 277/8 (708.0) 20 (508) 14³/4 (375) 480 72.0 3 4 D48SX11S C/F C/F 195 (89) 277/8 (708.0) 20 (508) 16³/4 (425) 480 72.0 3 2 D48SX3S<</td><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 277/8 (708.0) 20 (508) 123/4 (324) 161/2 (419) 480 54.0 1 3 D36SX51S C2-229 C2-230 135 (62) 277/8 (708.0) 20 (508) 123/4 (324) 161/2 (419) 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 277/8 (708.0) 20 (508) 143/4 (324) 161/2 (419) 240 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 277/8 (708.0) 20 (508) 143/4 (375) 181/2 (470) 480 63.0 3 2 D42SX5S C2-229 C2-230 155 (71) 277/8 (708.0) 20 (508) 163/4 (425) 201/2 (521) 480 72.0<!--</td--><td>240 54.0 3 3 D36SX3S C4-144 C4-145 135 (62) 277/8 (708.0) 20 (508) 12³/4 (324) 16¹/2 (419) 13 (330) 480 54.0 1 3 D36SX11S C/F C/F 135 (62) 277/8 (708.0) 20 (508) 12³/4 (324) 16¹/2 (419) 13 (330) 480 54.0 3 2 D36SX5S C2-229 C2-230 135 (62) 277/8 (708.0) 20 (508) 14³/4 (375) 18¹/2 (470) 15 (381) 480 63.0 3 7 D42SX3S C4-148 C4-149 155 (71) 277/8 (708.0) 20 (508) 14³/4 (375) 18¹/2 (470) 15 (381) 480 63.0 3 4 D48SX3S C4-148 C4-149 195 (89) 277/8 (708.0) 20</td><td>240 54.0 3 3 3 3 3 3 3 3 3 </td></td></td></td></td<>	240 54.0 3 3 D36SX3S C4-144 C4-145 480 54.0 1 3 D36SX11S C/F C/F 480 54.0 3 2 D36SX5S 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Notes

• See Watt Density vs. Air Temperature/Velocity charts on page 379 to confirm suitability in the application.

 $\ensuremath{\mathsf{C/F}}$ - Contact factory, go to www.watlow.com/en/contact-us





Duct Heaters

D SERIES

Replacement Elements

Replaceable heating elements provide easy field service and reduce downtime. Element change-out is made simple by a single screw clamp.

To order replacement elements, specify the **replacement element part number** (from the table) that corresponds to the original Watlow duct heater part number. Then, specify **quantity.**

Replacement Elements

Original Duct Heater Part Numbers		cement ment Watts		nal Duct "A" Dim. (mm)	Replacement Element Part Number	Est. N Ibs	et Wt. (kg)
20 W/in ² (3.1 W/cm ²)							
D6S3 to D60S3	240	1000	27 ⁷ /8	(708.0)	D6240	1.0	(0.5)
D6S5 to D60S5	480	1000	27 ⁷ /8	(708.0)	D6480	1.0	(0.5)
D75S3	240	1250	32 ⁷ /8	(835.0)	D75240	1.0	(0.5)
D75S5	480	1250	32 ⁷ /8	(835.0)	D75480	1.0	(0.5)
D100S5	480	1667	40 ³ /8	(1025.5)	D100480	1.4	(0.7)
D125S5	480	2083	49 ³ /8	(1254.1)	D125480	1.7	(0.8)
30 W/in ² (4.7 W/cm ²)							
D6SX3 to D60SX3	240	1500	27 ⁷ /8	(708.0)	D6X240	1.0	(0.5)
D6SX5 to D60SX5	480	1500	27 ⁷ /8	(708.0)	D6X480	1.0	(0.5)
D75SX3	240	1917	32 ⁷ /8	(835.0)	D75X240	1.0	(0.5)
D75SX5	480	1917	327/8	(835.0)	D75X480	1.0	(0.5)
D100SX5	480	2500	40 ³ /8	(1025.5)	D100X480	1.4	(0.7)
D125SX5	480	3167	49 ³ /8	(1254.1)	D125X480	1.7	(0.8)

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Duct Heaters

LDH SERIES and D SERIES

Part Number

Stock Duct Part Number	Optional Terminal Enclosures	Optional Process Sensors	Sheath Limit Sensors

Stock Duct Part Number

Note: Catalog part numbers include optional enclosures. To order optional enclosures or sensors, substitute the appropriate suffix.

	Optional Terminal Enclosures
S =	General purpose enclosure
W=	Moisture resistant enclosure
	: Catalog listing is a general purpose enclosure. Substitute

Optional Bulb & Capillary Thermostats or Thermocouple Process Sensors							
PJ =	Type J process thermocouple in thermowell						
PK=	Type K process thermocouple in thermowell						

Sheath Limit Sensors									
HJ=	Type J high-limit thermocouple								
HK=	Type K high-limit thermocouple								

Example Part Number: D6SX10 S J HJ



Duct Heaters

MDH SERIES

Watlow's line of process air heaters offer improved performance and increased versatility in medium to low temperature applications.

The duct heaters are modular and consist of two parts. The first is a six kilowatt heater available in either 240 or 480 volts, single- or three-phase.

The second part of the heater consists of the electrical terminal enclosure protecting each module's termination area and a main flange that bolts into the user's ductwork. The heater modules are installed in the housing and main flange via rectangular slots in the main flange. The range of modules that can be accommodated in various duct heater assemblies range from one to 10 modules. A range of six to 60 kilowatts, in six kilowatt increments is achieved.

The new design of the modular duct heater offers increased reliability. The individual modules are removable through the terminal enclosure of the assembly, which eliminates the need to pull the complete heater from the ductwork. This reduces downtime and costs because the heating elements can be replaced individually.

Performance improvements include quicker response time and reduced infiltration from the air stream being heated into the electrical enclosure.

Features and Benefits

Individual modules removable through housing

• Reduces downtime for replacement of module

Smaller diameter elements (0.315 inch)

 Results in a 25 percent lower energy usage on initial heat-up

27 percent reduction in heat-up time as compared to traditional 0.430 inch diameter duct heater elements

Results in faster response time

31 percent lighter weight than traditional tubular duct heaters

Reduces shipping costs and increases worker safety

Greater free cross sectional area

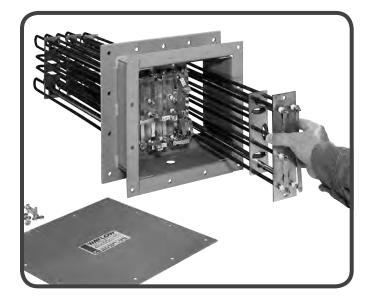
Results in lower pressure drop

Improved seal between element and electrical terminal enclosure

• Results in lower electrical terminal enclosure temperature

Flexible module wiring

· Allows user to sequentially stage modules



Typical Applications

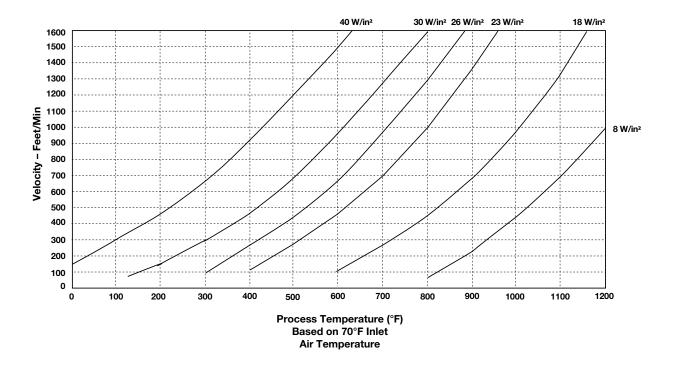
- Low temperature ovens
- Parts drying
- Semiconductor cleanroom environmental heating
- Plastic curing
- Load banks
- · Heated air knives
- Food dehydration
- · Heat shrink tunnels



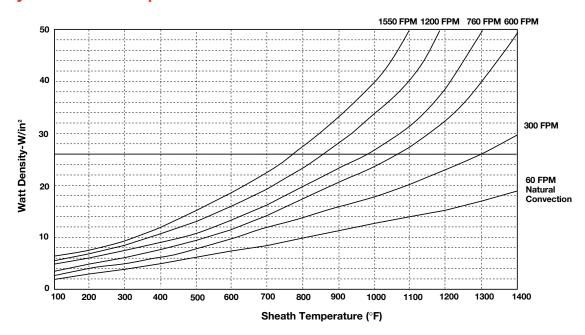
Duct Heaters

MDH SERIES

Velocity vs. Process Temperature



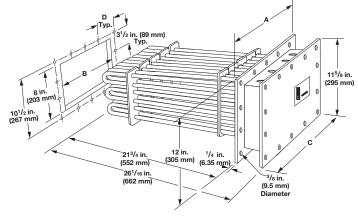
Watt Density vs. Sheath Temperature



Duct Heaters

MDH SERIES





Application: Air Heating - Maximum Outlet Temperature - 750°F (399°C)

									NNECT /N			nsions 1.	
Watt Density W/in ²	kW	Volts	Phase	No. of Circuits	No. of Modules	Est. Shipping Wt. Ibs	Part Number	J T/C	K T/C	A	В	С	D
26	6	240	1	1	1	35	MDH6S10	C/F	C/F	6.50	2.50	5.75	2.50
26	6	240	3	1	1	35	MDH6S3	C2-50	C2-92	6.50	2.50	5.75	2.50
26	6	480	1	1	1	35	MDH6S11	C/F	C/F	6.50	2.50	5.75	2.50
26	6	480	3	1	1	35	MDH6S5	C2-43	C2-35	6.50	2.50	5.75	2.50
26	12	240	1	2	2	39	MDH12S10	C/F	C/F	8.50	4.75	7.75	3.50
26	12	240	3	1	2	39	MDH12S3	C2-236	C2-214	8.50	4.75	7.75	3.50
26	12	480	1	1	2	39	MDH12S11	C/F	C/F	8.50	4.75	7.75	3.50
26	12	480	3	1	2	39	MDH12S5	C2-43	C2-35	8.50	4.75	7.75	3.50
26	18	240	1	3	3	46	MDH18S10	C/F	C/F	10.50	7.00	9.75	3.00
26	18	240	3	1	3	46	MDH18S3	C2-236	C2-214	10.50	7.00	9.75	3.00
26	18	480	1	1	3	46	MDH18S11	C/F	C/F	10.50	7.00	9.75	3.00
26	18	480	3	1	3	46	MDH18S5	C2-43	C2-35	10.50	7.00	9.75	3.00
26	24	240	1	4	4	67	MDH24S10	C/F	C/F	12.50	9.25	11.75	2.75
26	24	240	3	2	4	67	MDH24S3	C2-218	C2-224	12.50	9.25	11.75	2.75
26	24	480	1	2	4	67	MDH24S11	C/F	C/F	12.50	9.25	11.75	2.75
26	24	480	3	1	4	67	MDH24S5	C2-225	C2-226	12.50	9.25	11.75	2.75
26	30	240	3	2	5	84	MDH30S3	C2-218	C2-224	15.75	11.50	15.00	3.56
26	30	480	1	2	5	84	MDH30S11	C/F	C/F	15.75	11.50	15.00	3.56
26	30	480	3	1	5	84	MDH30S5	C2-225	C2-226	15.75	11.50	15.00	3.56
26	36	240	3	2	6	95	MDH36S3	C2-218	C2-224	18.00	13.75	17.25	4.13
26	36	480	1	2	6	95	MDH36S11	C/F	C/F	18.00	13.75	17.25	4.13
26	36	480	3	1	6	95	MDH36S5	C2-225	C2-226	18.00	13.75	17.25	4.13
26	42	240	3	3	7	109	MDH42S3	C4-144	C4-145	20.25	16.00	19.50	4.69
26	42	480	1	3	7	109	MDH42S11	C/F	C/F	20.25	16.00	19.50	4.69
26	42	480	3	2	7	109	MDH42S5	C2-229	C2-230	20.25	16.00	19.50	4.69
26	48	240	3	4	8	137	MDH48S3	C4-148	C4-149	22.50	18.25	21.75	5.25
26	48	480	1	3	8	137	MDH48S11	C/F	C/F	22.50	18.25	21.75	5.25
26	48	480	3	2	8	137	MDH48S5	C2-229	C2-230	22.50	18.25	21.75	5.25
26	54	240	3	3	9	144	MDH54S3	C4-144	C4-145	24.75	20.50	24.00	5.81
26	54	480	1	3	9	144	MDH54S11	C/F	C/F	24.75	20.50	24.00	5.81
26	54	480	3	2	9	144	MDH54S5	C2-229	C2-230	24.75	20.50	24.00	5.81
26	60	240	3	4	10	165	MDH60S3	C4-148	C4-149	27.00	22.75	26.25	6.38
26	60	480	1	4	10	165	MDH60S11	C/F	C/F	27.00	22.75	26.25	6.38
26	60	480	3	2	10	165	MDH60S5	C2-229	C2-230	27.00	22.75	26.25	6.38

Options include individual modules with optional general purpose terminal enclosure, high-temperature thermocouple kit and blank flange modules. C/F - Contact factory, go to www.watlow.com/en/contact-us

Modular duct heaters with 1 and 2 modules have conduit openings for one, 1 inch NPT fitting.

Modular duct heaters with 3, 4, 5, and 7 modules have conduit openings for two, 1 inch NPT fittings.

Modular duct heaters with 6, 8, 9, and 10 modules have conduit openings for two, 1¹/₄ inch NPT and two, 1 inch NPT fittings.

♦ WATLOW. **•**



Duct Heaters

MDH SERIES

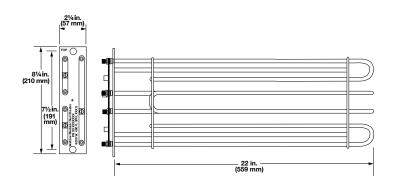
Individual Module Dimensions

Specifications

- Module rating 240 or 480VAC, 6kW, three-phase or one-phase
- Watt density 26 W/in²
- Elements 0.315 inch dia. alloy 840 elements
- High-limit thermocouple installed by drilling premarked hole in flange
- 6-60kW range when mounted in duct heater assembly

Application Information

- Maximum sheath temperature = 1200°F (649°C)
- Maximum outlet temperature = 750°F (399°C)



Options

Terminal Enclosures

Terminal enclosures are available in general purpose and moisture resistant configurations.

High-Limit Thermocouples

High-limit thermocouples can be supplied on specified modules or shipped as a kit. Available thermocouples are Types J and K.

Blank Module Covers

Module covers are available for covering blank slots on the main flange. This allows for adding heater modules at a later time to allow higher wattage outputs.

Replacement Modules

Replacement modules provide easy field service and reduce downtime. To order replacement modules specify the **replacement module** part number (from the table), then specify the **quantity**.

Watlow Part Number	Description								
Replacement Modules									
M63	6kW, 240V, 3 phase								
M610	6kW, 240V, 1 phase								
M65	6kW, 480V, 3 phase								
M611	6kW, 480V, 1 phase								
High Limit Thermo	couple Kits								
MTCJ	Type J (0-1000°F)								
MTCK	Type K (0-2000°F)								



Finned Heaters

375 Finned Strip Heaters

Watlow's 375 finned strip heater is constructed of highly-compacted magnesium oxide (MgO) based insulation, which conducts heat efficiently from the nickel chromium element wire to the sheath. Two-inch wide (51 mm) nickel plated fins are attached to maximize surface contact allowing heat to transfer into the air faster. Lower sheath temperature and element life are maximized by this finned construction.

Performance Capabilities

- Aluminized steel sheath temperatures up to 1100°F (595°C)
- Watt density up to 33 W/in² (5.1 W/cm²)
- UL® approved up to 240VAC (File No. E52951)
- CSA approved up to 480VAC (File No. LR7392)

Features and Benefits

Nickel chromium element wire is centered in the heater

• Ensures temperature uniformity

Aluminized steel sheath

- Operates at higher temperatures
- Resists corrosion more effectively than iron-sheathed heaters

Optional 430 stainless steel sheath

 Provides a durable solution for highly-corrosive environments

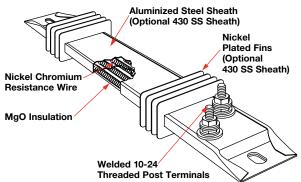
Welded post terminals

• Produces strong, trouble-free connections

Available lengths from $5^{1/2}$ to 48 in. (140 to 1220 mm)

• Fits a variety of application needs





Typical Applications

- Enclosure heating
- Load bank resistors
- Shrink tunnels
- Duct heaters
- Space heaters
- · Drying ovens
- Incubators
- Air heating
- Heat curing
- Ink drying
- Food warmers
- Moisture protection
- Dehumidifiers
- Stress relieving ovens



Finned Heaters

375 Finned Strip Heaters

Applications and Technical Data

Calculating Watt Density

Use the graph and formulas to ensure that the maximum allowable watt density for the heater is not exceeded in the application.

Open air watt density is calculated for the total heated surface area.

Formulas

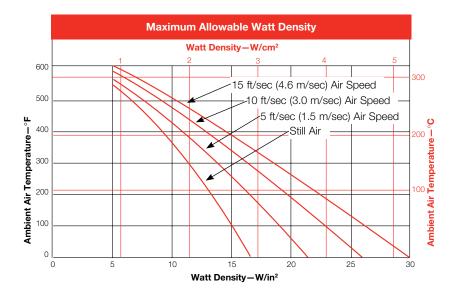
Watt Density =
$$\frac{\text{Wattage}}{\text{Heated Area}}$$

Heated Area

Heated Area

Heated Area

(One-on-One Terminals) = [Overall Length (A) - 4.25 in.]
$$\times$$
 3.75 in. = [Overall Length (A) - 108 mm] \times 95.3 mm



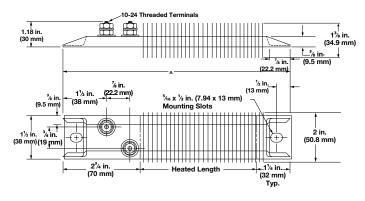


Finned Heaters

375 Finned Strip Heaters

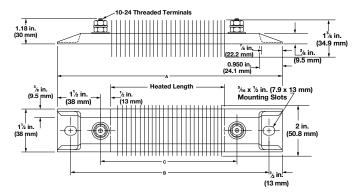
Termination Options

Offset Terminals



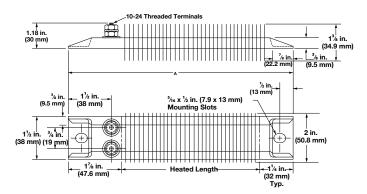
Two 10-24 threaded post terminals are offset from each other on the same end.

One-on-One Terminals



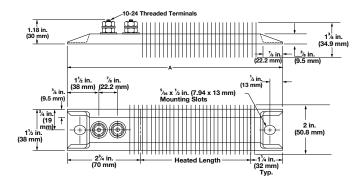
Two 10-24 threaded post terminals are placed one on each end.

Parallel Terminals



Two 10-24 threaded post terminals are used; both terminals on one end.

In-Line Terminals



Two 10-24 threaded post terminals are in-line with each other on the same end.



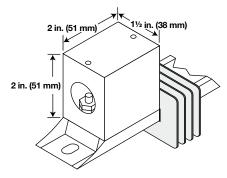
Finned Heaters

375 Finned Strip Heaters

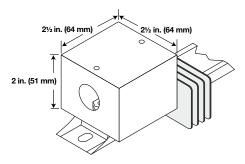
Termination Options (Continued)

Metallic Terminal Boxes - Variations

Metallic terminal boxes are available from stock on offset terminals. Terminal boxes act as a safety feature by covering the terminals. A conduit may be attached to the box through ⁷/8 in. (22.2 mm) diameter holes in the ends of the box. To order, specify **terminal box**.



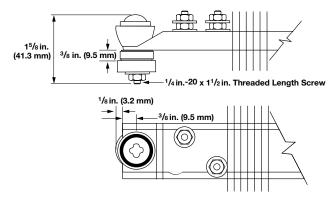
Available on in-line terminals only.



Available on offset terminals from stock and manufactured.

Accessories

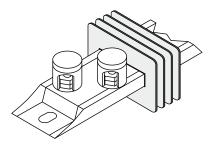
Secondary Insulation Bushings



Insulators are suitable when air heating and/or voltage to ground is a concern. A secondary insulation bushing kit, part number **Z-5230**, contains one set of bushings for one heater. To accommodate bushings, $^{17}/_{32} \times ^{11}/_{16}$ inch diameter mounting holes **must** be specified when ordering.

Note: Number of fins are dependent on length of heater.

Ceramic Terminal Covers



Ceramic terminal covers offer a convenient and economical method to insulate post terminals. A 10-24 screw thread is sized for standard length posts and is supplied as an accessory item and shipped separately. Specify **Z-4918** and quantity.



Finned Heaters

375 Finned Strip Heaters

Heater Part Numbers

Part	. Net Wt.	Approx. Net Wt.			Power		Length			Width
Number	(kg)	lbs	cm²)	(W/	(Watts)	Volts	mm)	in. (Termination	in. (mm)
SGA1J5JY2	(0.23)	0.5	(2.1)	14	125	120	(140)	5 ¹ /2	Parallel	1 ¹ / ₂ (38)
SGA1J5JY3	(0.23)	0.5	(4.3)	28	250	120	(140)		Parallel	. ,
SGA1J6AY1	(0.23)	0.5	(2.1)	14	150	120	(152)	6	Parallel	
SGA1J6AY2	(0.23)	0.5	(2.1)	14	150	240	(152)	6	Parallel	
SGA1J6AY3	(0.23)	0.5	(4.3)	28	300	120	(152)	6	Parallel	
SGA1J6AY4	(0.23)	0.5	(4.3)	28	300	240	(152)	6	Parallel	
SGA1J7JW1	(0.32)	0.7	(1.8)	12	150	120	(191)	7 ¹ /2	Offset	
SGA1J7JW2	(0.32)	0.7	(1.8)	12	150	240	(191)	71/2	Offset	
SGA1J7JW3	(0.32)	0.7	(2.3)	15	200	240	(191)	71/2	Offset	
SGA1J8AW2	(0.32)	0.7	(1.5)	10	150	120	(203)	8	Offset	
SGA1J8AW3	(0.32)	0.7	(1.5)	10	150	240	(203)	8	Offset	
SGA1J8AW4	(0.32)	0.7	(1.8)	12	175	120	(203)	8	Offset	
SGA1J8AW5	(0.32)	0.7	(1.8)	12	175	240	(203)	8	Offset	
SGA1J8AW6	(0.32)	0.7	(2.6)	17	250	120	(203)	8	Offset	
SGA1J8AW7	(0.32)	0.7	(2.6)	17	250	240	(203)	8	Offset	
SGA1J8AW8	(0.32)	0.7	(4.2)	27	400	120	(203)	8	Offset	
SGA1J8AW9	(0.32)	0.7	(4.2)	27	400	240	(203)	8	Offset	
SGA1J8AW10	(0.32)	0.7	(5.1)	33	500	120	(203)	8	Offset	
SGA1J8AW1	(0.32)	0.7	(5.1)	33	500	240	(203)	8	Offset	
SGA1J10JW1	(0.40)	0.9	(1.5)	10	250	120	(267)	10 ¹ /2	Offset	
SGA1J10JW2	(0.40)	0.9	(1.5)	10	250	240	(267)	10 ¹ /2	Offset	
SGA1J10JW3	(0.40)	0.9	(2.1)	14	350	120	(267)	10 ¹ /2	Offset	
SGA1J10JW4	(0.40)	0.9	(2.1)	14	350	240	(267)	10 ¹ /2	Offset	
SGA1J10JW5	(0.40)	0.9	(2.5)	16	400	120	(267)	10 ¹ /2	Offset	
SGA1J10JW6	(0.40)	0.9	(2.5)	16	400	240	(267)	10 ¹ /2	Offset	
SGA1J12AW	(0.45)	1.0	(1.2)	8	250	120	(305)	12	Offset	
SGA1J12AW2	(0.45)	1.0	(1.2)	8	250	240	(305)	12	Offset	
SGA1J12AW	(0.45)	1.0	(1.8)	12	350	120	(305)	12	Offset	
SGA1J12AW	(0.45)	1.0	(1.8)	12	350	240	(305)	12	Offset	
SGA1J12AW	(0.45)	1.0	(2.6)	17	500	120	(305)	12	Offset	
SGA1J12AW	(0.45)	1.0	(2.6)	17	500	240	(305)	12	Offset	
SGA1J14AW	(0.54)	1.2	(1.2)	8	300	120	(356)	14	Offset	
SGA1J14AW2	(0.54)	1.2	(1.2)	8	300	240	(356)	14	Offset	
SGA1J14AW	(0.54)	1.2	(2.0)	13	500	120	(356)	14	Offset	
SGA1J14AW4	(0.54)	1.2	(2.0)	13	500	240	(356)	14	Offset	
SGA1J15EW1	(0.64)	1.4	(1.2)	8	325	120	(387)	15 ¹ /4	Offset	
SGA1J15EW2	(0.64)	1.4	(1.2)	8	325	240	(387)	15 ¹ /4	Offset	
SGA1J15EW3	(0.64)	1.4	(1.8)	12	500	240	(387)	15 ¹ /4	Offset	

CONTINUED

Note: 375 finned strip heaters with one-on-one terminations are available as a manufactured item only. Please contact your Watlow representative for additional information.

Note: Above heaters are modified stock and may not be returned for a restocking charge.

Note: $\frac{5}{16}$ x $\frac{1}{2}$ in. (7.9 x 13 mm) mounting holes are supplied on all 375 finned strip heaters as standard, larger mounting holes may be provided $\frac{17}{32}$ in. x $\frac{11}{16}$ in. (13.5 mm x 17.5 mm).

Note: Heaters can be customized given a business case review. Contact the factory for details.



Finned Heaters

375 Finned Strip Heaters

Heater Part Numbers (Continued)

Width		Length		Power	W/in²	Approx. Net Wt.	Part
in. (mm)	Termination	in. (mm)	Volts	(Watts)	(W/cm²)	lbs (kg)	Number
1 ¹ / ₂ (38)	Offset	17 ⁷ /8 (454)	120	350	8 (1.2)	1.6 (0.73)	SGA1J17RW1
	Offset	17 ⁷ /8 (454)	240	350	8 (1.2)	1.6 (0.73)	SGA1J17RW2
	Offset	17 ⁷ /8 (454)	120	375	9 (1.4)	1.6 (0.73)	SGA1J17RW3
	Offset	17 ⁷ /8 (454)	240	375	9 (1.4)	1.6 (0.73)	SGA1J17RW4
	Offset	17 ⁷ /8 (454)	120	500	12 (1.8)	1.6 (0.73)	SGA1J17RW5
	Offset	17 ⁷ /8 (454)	240	500	12 (1.8)	1.6 (0.73)	SGA1J17RW6
	Offset	17 ⁷ /8 (454)	120	750	18 (2.8)	1.6 (0.73)	SGA1J17RW7
	Offset	17 ⁷ /8 (454)	240	750	18 (2.8)	1.6 (0.73)	SGA1J17RW8
	Offset	17 ⁷ /8 (454)	120	1000	24 (3.7)	1.6 (0.73)	SGA1J17RW9
	Offset	17 ⁷ /8 (454)	240	1000	24 (3.7)	1.6 (0.73)	SGA1J17RW10
	Offset	19 ¹ / ₂ (495)	240	350	6 (.9)	1.7 (0.77)	SGA1J19JW2
	Offset	19 ¹ / ₂ (495)	120	500	9 (1.4)	1.7 (0.77)	SGA1J19JW3
	Offset	19 ¹ / ₂ (495)	240	500	9 (1.4)	1.7 (0.77)	SGA1J19JW4
	Offset	19 ¹ / ₂ (495)	240	750	13 (2.0)	1.7 (0.77)	SGA1J19JW5
	Offset	19 ¹ / ₂ (495)	240	1000	17 (2.6)	1.7 (0.77)	SGA1J19JW6
	Offset	21 (533)	120	500	8 (1.2)	1.9 (0.86)	SGA1J21AW3
	Offset	21 (533)	240	500	8 (1.2)	1.9 (0.86)	SGA1J21AW4
	Offset	21 (533)	120	750	12 (1.8)	1.9 (0.86)	SGA1J21AW5
	Offset	21 (533)	240	750	12 (1.8)	1.9 (0.86)	SGA1J21AW6
	Offset	23 ³ /4 (603)	240	500	7 (1.0)	2.1 (0.95)	SGA1J23NW3
	Offset	23 ³ /4 (603)	240	750	10 (1.5)	2.1 (0.95)	SGA1J23NW5
	Offset	23 ³ /4 (603)	120	1000	14 (2.1)	2.1 (0.95)	SGA1J23NW6
	Offset	23 ³ /4 (603)	240	1000	14 (2.1)	2.1 (0.95)	SGA1J23NW7
	Offset	23 ³ /4 (603)	240	1500	20 (3.1)	2.1 (0.95)	SGA1J23NW8
	Offset	25 ¹ / ₂ (648)	120	500	6 (0.9)	2.3 (1.00)	SGA1J25JW2
	Offset	25 ¹ / ₂ (648)	240	500	6 (0.9)	2.3 (1.00)	SGA1J25JW3
	Offset	25 ¹ / ₂ (648)	120	750	9 (1.4)	2.3 (1.00)	SGA1J25JW4
	Offset	25 ¹ / ₂ (648)	240	750	9 (1.4)	2.3 (1.00)	SGA1J25JW5
	Offset	25 ¹ / ₂ (648)	240	1000	12 (1.8)	2.3 (1.00)	SGA1J25JW6
	Offset	26 ³ /4 (680)	240	700	8 (1.2)	2.4 (1.10)	SGA1J26NW2
	Offset	26 ³ /4 (680)	240	1000	12 (1.8)	2.4 (1.10)	SGA1J26NW3
	Offset	30 ¹ / ₂ (775)	120	750	8 (1.2)	2.7 (1.20)	SGA1J30JW1
	Offset	30 ¹ / ₂ (775)	240	750	8 (1.2)	2.7 (1.20)	SGA1J30JW2
	Offset	33 ¹ / ₂ (851)	240	750	7 (1.0)	3.0 (1.40)	SGA1J33JW1
	Offset	35 ⁷ /8 (911)	120	1000	8 (1.2)	3.2 (1.50)	SGA1J35RW1
	Offset	35 ⁷ /8 (911)	240	1000	8 (1.2)	3.2 (1.50)	SGA1J35RW2
	Offset	35 ⁷ /8 (911)	240	1500	13 (2.0)	3.2 (1.50)	SGA1J35RW3
	Offset	38 ¹ / ₂ (978)	120	1000	8 (1.2)	3.4 (1.50)	SGA1J38JW2
	Offset	381/2 (978)	240	1500	11 (1.7)	3.4 (1.50)	SGA1J38JW3
	Offset	42 ¹ / ₂ (1080)	240	1500	10 (1.5)	3.8 (1.70)	SGA1J42JW1
	Offset	47 ⁷ /8 (1216)	240	2250	16 (2.4)	4.3 (2.00)	SGA1J47RW2

Note: 375 finned strip heaters with one-on-one terminations are available as a manufactured item only. Please contact your Watlow representative for additional information.

Note: Above heaters are modified stock and may not be returned for a restocking charge.

Note: 5 /16 x 1 /2 in. (7.9 x 13 mm) mounting holes are supplied on all 375 finned strip heaters as standard, larger mounting holes may be provided 17 /32 in. x 11 /16 in. (13.5 mm x 17.5 mm).



Finned Heaters

FINBAR™ Single-Ended Heaters

Composed of aluminized steel fins press fitted to a one-inch single-ended FIREBAR element. The FINBAR™ is designed to improve heat transfer to the air and permits putting more power in tighter spaces—like forced air ducts, dryers, ovens and load bank resistors.

Heat transfer, lower sheath temperature and element life are all maximized by its finned construction. Installation is simplified by terminations exiting at one end and mounting accommodations on both ends.

Performance Capabilities

- Watt densities up to 50 W/in² (7.7 W/cm²)
- 304 stainless steel sheath temperatures up to 1200°F (650°C)
- Voltages up to 480VAC
- Amperages up to 48 amperes per heater or 16 amperes per coil

Features and Benefits

Rugged aluminized steel fins

 Provides an increase in surface area to approximately 16 square inches for every linear inch of element length. Fins press fitted to the heating element improve heat transfer to the air

Single-ended termination

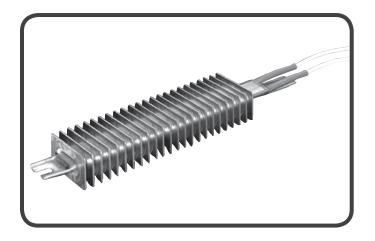
· Simplifies wiring and installation

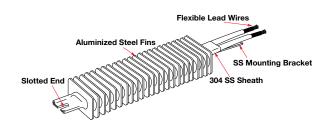
Stainless steel mounting bracket, welded to the terminal end, supplied with a slotted end

Allows ease of installation

Lavacone seals

 Provides protection against humid storage conditions, moisture retardant to 221°F (105°C)





Typical Applications

- Forced air heating for dryers, ovens, ducts
- Still air heating for ovens, comfort heating
- Incubators
- Ink drying
- Load bank resistors

For detailed product and technical data, see the full FINBAR product section located on pages 103 through 105.



FIREROD® CARTRIDGE Heaters

The Watlow® FIREROD® cartridge heater incorporates engineering excellence and is supported by over 60 years of solid industry performance across a broad range of simple and complex applications. As the premier choice in swaged cartridge heating, thousands of industrial manufacturers continue to choose Watlow as their trusted thermal partner and certified cartridge heater supplier.

Built using premium materials and tight manufacturing controls, the FIREROD heater provides superior heat transfer, uniform temperatures, resistance to oxidation and corrosion and a long life even at high temperatures. Every system component that leaves our manufacturing facilities meets our strict quality assurance specifications, in addition to those set forth by leading standards and regulating industries.

To meet our customer's individual needs, there are many delivery options available for FIREROD heaters.

Performance Capabilities

- Part temperatures up to 1400°F (760°C) on alloy 800 sheath
- Watt densities up to 400 W/in² (62 W/cm²)
- Maximum voltage up to 480V

Features and Benefits

Nickel-chromium resistance wire

 Ensures even and efficient distribution of heat to the sheath

Metalurgically-bonded conductor pins

• Ensures a trouble-free electrical connection

Magnesium oxide insulation of specific grain and purity

 Results in high dielectric strength and contributes to faster heat-up

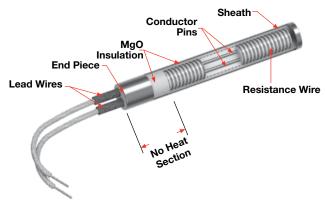
Alloy 800 sheath

 Resists oxidation and corrosion from heat, many chemicals and atmospheres

Minimal spacing between the element wire and sheath

- Results in lower internal temperature
- Accommodates a design with fewer or smaller heaters operating at higher watt densities





International Organization for Standardization (ISO) 9001 certified

Provides confidence that quality and reliability expectations are met

UL® and CSA approved flexible stranded wires

 Lead insulation rated to temperatures up to 840°F (450°C)

Patented lead adapter (LA) method

 Allows same day shipment on more than 150,000 configurations of stock FIREROD heaters and lead combinations

For detailed product and technical data, see the full FIREROD product section located on pages 9 through 44.



Enclosure Heaters

WATROD™ Heaters

Designed to prevent freezing and condensation in electrical and mechanical enclosures, the WATROD™ element is enclosed in a perforated, aluminized-steel bracket.

Performance Capabilities

- Watt densities up to 15 W/in² (2.3 W/cm²)
- Wattages up to 1000 watts
- UL® and CSA component recognition up to 250VAC

Features and Benefits

Stainless steel sheath wall

 Resists corrosion and protects the heating coil from exposure

Silicone resin seal

 Provides protection against humid storage conditions and is effective to 390°F (200°C)

Perforated aluminized-steel mounting bracket

 Eases installation and helps prevent direct contact with the heating element

Stock straight projection Type B #10-32 screw lug terminals

• Provides easy electrical connection

Made-to-order threaded stud

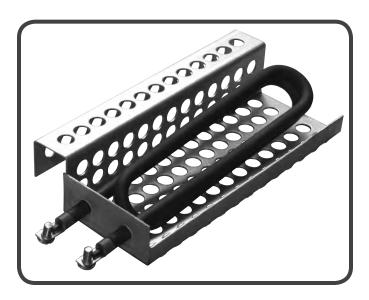
Provides quick connect and flexible lead wire termination options

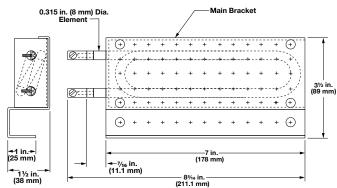
Typical Applications

- Control panels
- Traffic signal boxes
- · Automated teller machines
- · Switch gear
- Electronic equipment

Application Hints

- Locate heater(s) in the lowest portion of the enclosure to maximize convection heating
- Place thermostat(s) in the upper half of the enclosure, away from the heater(s)







Enclosure Heaters

WATROD Heaters

Technical Heaters

		att sity	Part N	Part Number					
Watts	W/in² (W/cm²)		125VAC	250VAC	lbs	(kg)			
95	4	(0.6)	EN951		1.5	(0.7)			
100	4	(0.6)		EN10010	1.5	(0.7)			
250	10	(1.6)	EN2501	EN25010	1.5	(0.7)			
375	15	(2.3)	EN3751	EN37510	1.5	(0.7)			



Enclosure Heaters

Silicone Rubber Heaters

Designed for freeze and condensation protection, Watlow's enclosure heaters are rugged, reliable and safe to operate. These rectangular-shaped, wire-wound silicone rubber heaters can be ordered individually with adhesive or vulcanized to an aluminum mounting plate. A thermostat can be attached to the heater or mounted separately as shown.

Performance Capabilities

- Watt density rating of 5 W/in² (0.8 W/cm²)
- Temperature up to 150°F (66°C)

Features and Benefits

Pressure-sensitive adhesive mounting to an aluminum plate or customer cementing

- · Reduces installation time
- Creates easy installation

Several standard thermostat set points

Ensures protection against freezing with minimal energy consumption

Variety of installation options

- Provide the option to utilize cement installation to ensure permanent heater attachment
- The pressure sensitive adhesive installation option saves assembly time
- Facilitate assembly and disassembly with factory installed aluminum plate mount

Remote thermostat option

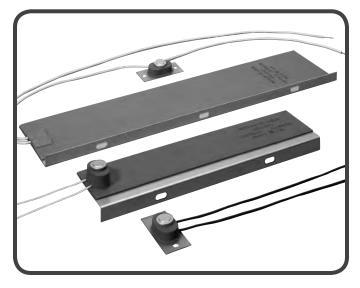
 Provides optimal choice of heater location versus temperature control location

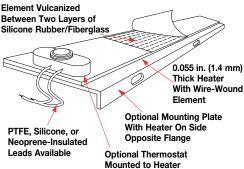
Lead options

- Allows for a variety of applications
- Allows different lead lengths for a variety of wiring requirements

Factory pre-wired heater and thermostat

Ensures safety and reliability as there are no exposed electrical connections





Typical Applications

Freeze or condensation prevention in housings containing electronic equipment including:

- Traffic signal boxes
- Automated teller machines
- Temperature control panels
- Gas or liquid control valve housings



Enclosure Heaters

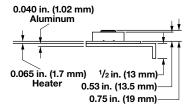
Silicone Rubber Heaters

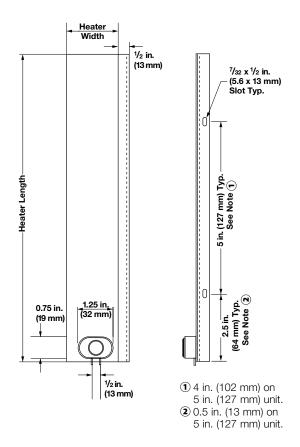
Options

Aluminum Mounting Plate

Both vertical and horizontal mounting can be accomplished with enclosure heaters. Mounting plates are 0.040 in. (1.02 mm) thick, specified as #3003 H14 aluminum. The preferred orientation is vertical with a thermostat attached at the lower end (as shown in the drawing).

For horizontal mounting, a remote thermostat is recommended. An enclosure heater can be ordered by itself, with PSAS or vulcanized to an aluminum mounting plate. See the *Thermostat* section below for more information.





Thermostats

Mounted on Heater

Built-in snap action thermostats from Watlow sense air temperature. See the ordering chart on the following page for available settings.

Remote From Heater

For an air sensing thermostat that is separate from the heater, the ST-207E is ideal. It is a modified ST-207 mounted on a ¹/₃₂ in. (0.8 mm) thick G-10 circuit board with the thermostat's metal cap exposed to sense air temperature. The thermostat is placed at the midpoint of the lead length. The sensor can be preset at the temperatures listed for integral sensors.

Notes:

- On both integral and remote sensors, the thermostat's exposed metal cap is vulnerable to impact. This could defeat the thermostat's switching action and cause heater malfunction.
- T-10 thermostats are not recommended for enclosure heating applications.



Enclosure Heaters

Silicone Rubber Heaters

Technical Data

Determining Minimum Wattage Requirements For Enclosures

This chart is an excellent guide for determining total wattage requirements for both insulated and uninsulated enclosures, assuming the box is relatively airtight.

For windy conditions, add an additional 50 percent to the wattage requirement listed.

		Total Enclosure Surface Area – Square Feet (Square Meters)													
		2 (0.2)	3 (0.3)	4 (0.4)	5 (0.5)	6 (0.6)	7.5 (0.7)	9 (0.8)	10 (0.9)	15 (1.4)	20 (1.9)	25 (2.3)	30 (2.8)	40 (3.7)	50 (4.7)
	20	30	40	55	70	80	100	120	135	205	270	335	405	540	670
(C)	(11)	10	10	15	20	20	25	30	35	50	65	80	100	130	160
₽	40	55	80	110	135	160	200	245	270	405	540	670	805	1075	1340
Ambient	(22)	15	20	30	35	40	50	60	65	100	130	160	195	260	320
m ig	60	90	120	160	205	245	300	365	405	605	805	1005	1210	1610	2010
	(33)	20	30	55	50	60	75	90	100	145	195	240	290	385	480
from	80	110	160	215	270	325	400	485	540	805	1075	1340	1610	2145	2680
	(44)	30	40	55	65	80	100	115	130	195	260	320	385	515	640
Rise	100	135	200	270	335	405	500	605	670	1005	1340	1675	2010	2680	3350
are	(56)	35	50	65	80	100	125	145	160	240	320	400	480	640	800
rat	120	165	240	320	405	485	600	725	805	1210	1610	2010	2415	3220	4020
npe	(67)	40	60	80	100	115	150	175	195	290	385	480	580	770	960
Temperature	140	190	280	375	470	565	700	845	940	1410	1880	2345	2815	3755	4690
Ī	(78)	45	70	90	115	135	175	205	225	340	450	560	675	900	1120

Uninsulated boxes

Insulated boxes

Silicone Rubber Enclosure Heaters Offering

For a complete list of silicone rubber product offerings available for use as an enclosure heater with a thermostat, please refer to the offerings on page 119.



FLUENT® In-line Heaters

Watlow's FLUENT® in-line fluid heater is a small, lightweight, high-performance heater that can replace both a traditional immersion type heater or a heater wrapped around a tube as part of a thermal system. Watlow's FLUENT heater is designed as an integrated solution that replaces multiple components in a system. This heater design reduces overall system cost and complexity. Because of its high watt density, it offers ultra-fast response leading to higher system performance. Featuring Watlow's patented layered heater technology, the heater makes use of its entire surface to produce heat, which optimizes heat transfer and temperature uniformity.

Features and Benefits

Small, lightweight, robust heater construction

- Replaces multiple components in a system
- Reduces overall system size
- · Lowers total cost of ownership

Patented circuit patterning process

- Facilitates customizable heating profiles
- Enables distributed wattage and/or multiple zones
- Assures precise and repeatable power distribution

High watt density, low mass heater

- Contributes to fast response time
- Allows for efficient heat transfer
- Enables on-demand process start-up



Typical Applications

- Hemodialysis fluid heating
- Food cooking equipment
- · Semiconductor purge and carrier gas heating
- Ink preheating systems
- On-demand fluid heating

Your Authorized Supplier is:



Batavia, IL - Rockford, IL - Waukesha, WI - Appleton, WI

www.ashequipment.com I sales@ashequipment.com

For detailed product and technical data, see the full FLUENT in-line product section located on pages 445 through 448.