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Little Rock, AR 72231
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Date: 07/09/2026
Return Request: 07/30/2026
Project: Highlands Building at Pinnacle Hills
Supplier: Comfort Systems USA
Manufacturer: Various
Submittal: Plumbing Equipment
Submittal Number: 22 30 00-01
Drawing # and Installation: Plumbing

ARCHITECT

Crafton Tull
Fayetteville, Ar.

ENGINEER

IMEG

GENERAL CONTRACTOR

Clark Contractors
Rogers, Ar.

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
116 Commercial Ave.
Lowell, AR 72745
(479) 770.8992

NOTES:

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CSUSA PROJECT NO.
26-5034

jzuber@comfortar.com



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-1

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

AUTOMATIC OVERHEAT PROTECTION - Provides automatic overheat safety control with manual reset high limit feature.

TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

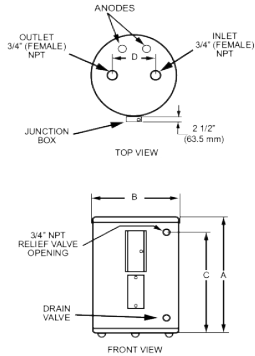
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

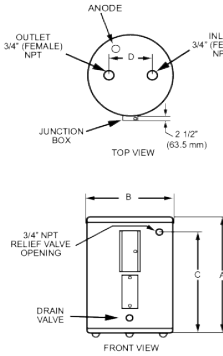


DIMENSIONS & SPECIFICATIONS

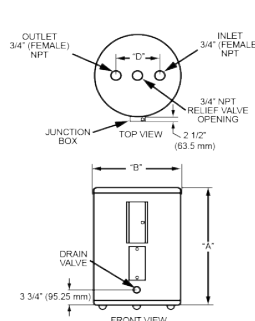
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
 * Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule					
Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)						
Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2101. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



Lochinvar, LLC
 300 Maddox Simpson Parkway
 Lebanon, Tennessee 37090
 P: 615.889.8900 / F: 615.547.1000

[www.Lochinvar.com](https://www.lochinvar.com)



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

Date/Rev: 10-02-23 / Rev G / Sht 1 of 1



Product Submittal	
Name	
Date	
Architect/Owner	
Contractor	
Tag	
Notes	

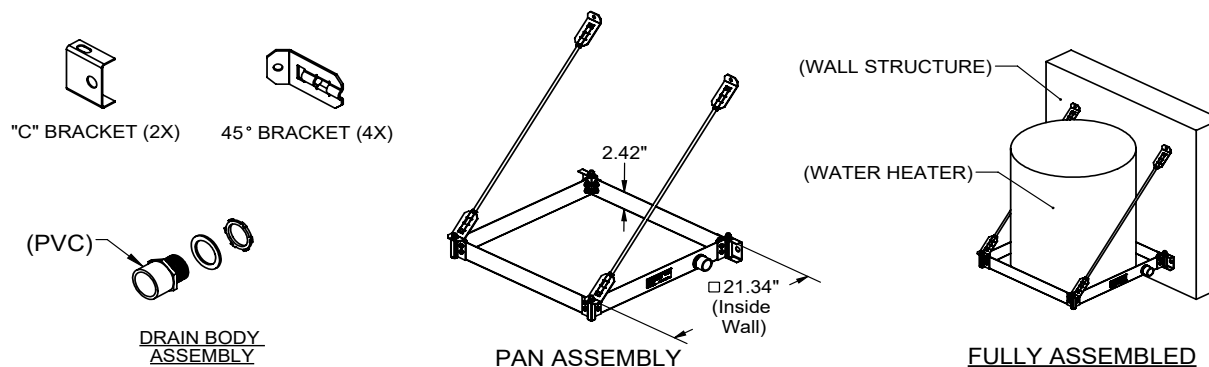
HoldRite QUICK STAND™ #40-SWHP-W Wall Mounted Equipment Platform

Product Specification Drawing

The #40-SWHP-W Wall Mounted Equipment Platform is engineered to support water heaters up to 20 U.S. gallons (or other equipment up to 375 pounds total weight) mounted to a wall. This item also serves as a drain pan. See Installation Instructions for detail.

Product Information:

- Material:
 - Pan: 14 gage CRS, galvanized
 - Corner Brackets (4): 14 gage CRS, galvanized
 - C-Brackets (2): 16 gage CRS, galvanized
 - 45° Brackets (4): 12 gage, CRS, galvanized
 - Threaded Rod (2): Low carbon steel, zinc plated, 3/8" x 29-3/4" long
- Wide platform allows water heaters up to 21-1/4" diameter
- Watertight corners and drain fittings eliminate need for additional drain pan
- Static load rating 375 pounds with 2X safety factor (depending on structural anchorage)
- Professional Engineer reviewed documentation available
- Includes PVC drain body 1" MIPT x 1" FS
- Galvanized steel construction
- Suspends with user supplied 3/8" hardware to mount to wall, 4 places
- Installation instructions for mounting to concrete or framed wall structure available



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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-2

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

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ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

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TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

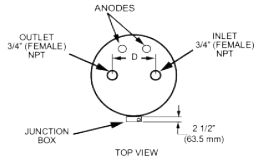
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

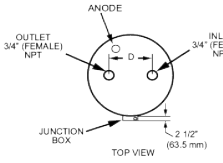


DIMENSIONS & SPECIFICATIONS

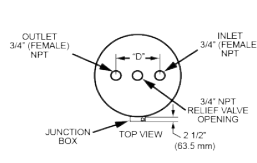
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100
	to LDT-120	Simultaneous			

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule

Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)

Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

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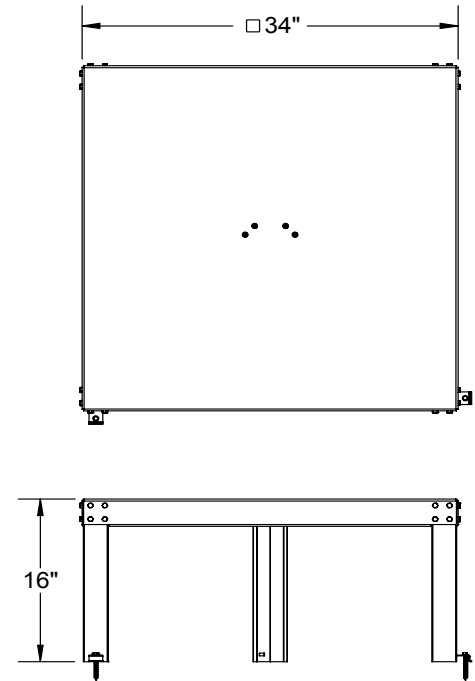
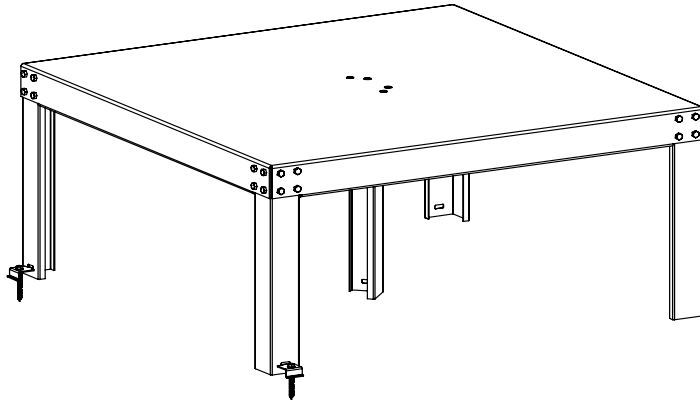
Lochinvar.com



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

PRODUCT SPECIFICATION DRAWING
QUICKSTAND™ 34" X 34" (Water Heater & Equipment Support)
#40-S-34-U (unassembled)



The QUICKSTAND™ #40-S-34-U stand safely elevates water heaters and other equipment above the floor (2,000 lbs rating).

ALL DIMENSIONS IN INCHES

Product Information:

- Material & Hardware:
 Top: 11GA CRS, Galvanized
 Attachment Bracket: 11GA CRS, Galvanized
 Leg: 16GA CRS, Galvanized, 5 places
 Safety Clip: 14GA CRS, Galvanized, 2 places
 Hex Bolt, #1/4-20 x 5/8"L, 36 places
 Screw, Machine, #1/4-20 X 5/8"L, SST, 100° Phillips Flat Head, 4 places
 Nut, Hex, #1/4-20, 40 places
 Washer, #1/4, External Tooth, Lock, 40 places
- Engineered and lab tested to meet Uniform Plumbing Code (UPC) and International Plumbing Code (IPC) requirements, including elevation of water heater's ignition source 18" above the floor
- Holds up to 2,000 pounds (typical 100 to 120 U.S. gallons plus)
- QUICKSTAND™ weight approximately 61 pounds without packaging
- Available in unassembled configuration ONLY

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HOLDRITE®

CONVERTING MAKESHIFT MET-ODS INTO ENGINEERED SOLUTIONS™

800-321-0316 OR 760-744-6944 / FAX: 760-744-0507 / WWW.HOLDRITE.COM
 spec_40-S-34-U_RevA

Product Submittal	
Job Name:	
Date:	
Part Number:	Qty:
Architect / Owner:	
Contractor:	
Notes:	



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-3

COMMERCIAL WATER HEATERS

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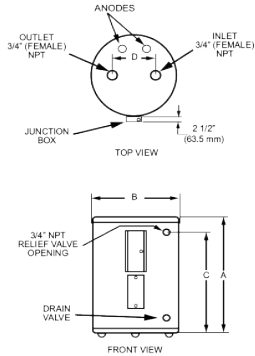
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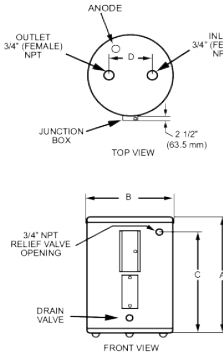


DIMENSIONS & SPECIFICATIONS

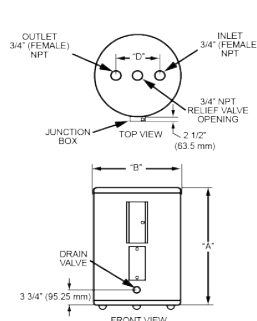
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LDT-30 XK - LDT-50 XK



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FOR EASE IN ORDERING
BY MODEL NUMBER

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Light Duty	Short	Tank Capacity	Voltage	Wattage

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	Max Wattage	6000*	6000*	6000	6000
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	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule

Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)

Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2101. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



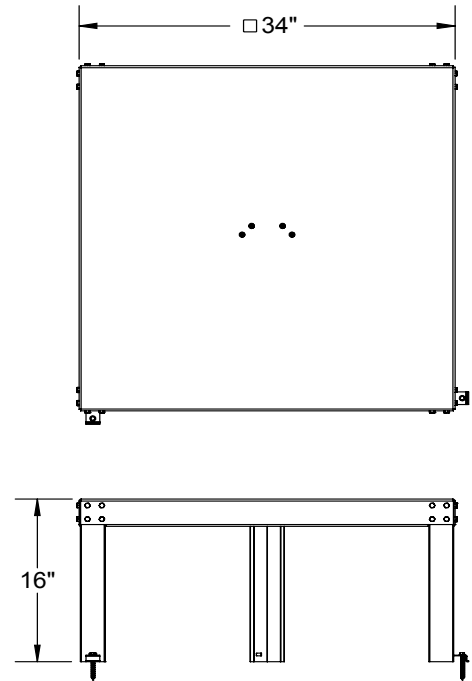
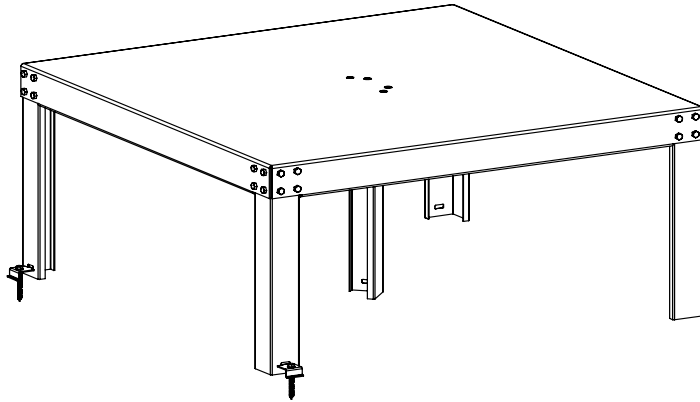
Lochinvar, LLC
300 Maddox Simpson Parkway
Lebanon, Tennessee 37090
P: 615.889.8900 / F: 615.547.1000
Lochinvar.com



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

PRODUCT SPECIFICATION DRAWING
QUICKSTAND™ 34" X 34" (Water Heater & Equipment Support)
#40-S-34-U (unassembled)



The QUICKSTAND™ #40-S-34-U stand safely elevates water heaters and other equipment above the floor (2,000 lbs rating).

ALL DIMENSIONS IN INCHES

Product Information:

- Material & Hardware:
 Top: 11GA CRS, Galvanized
 Attachment Bracket: 11GA CRS, Galvanized
 Leg: 16GA CRS, Galvanized, 5 places
 Safety Clip: 14GA CRS, Galvanized, 2 places
 Hex Bolt, #1/4-20 x 5/8"L, 36 places
 Screw, Machine, #1/4-20 X 5/8"L, SST, 100° Phillips Flat Head, 4 places
 Nut, Hex, #1/4-20, 40 places
 Washer, #1/4, External Tooth, Lock, 40 places
- Engineered and lab tested to meet Uniform Plumbing Code (UPC) and International Plumbing Code (IPC) requirements, including elevation of water heater's ignition source 18" above the floor
- Holds up to 2,000 pounds (typical 100 to 120 U.S. gallons plus)
- QUICKSTAND™ weight approximately 61 pounds without packaging
- Available in unassembled configuration ONLY

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 spec_40-S-34-U_RevA

Product Submittal	
Job Name:	
Date:	
Part Number:	Qty:
Architect / Owner:	
Contractor:	
Notes:	



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-4

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

AUTOMATIC OVERHEAT PROTECTION - Provides automatic overheat safety control with manual reset high limit feature.

TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

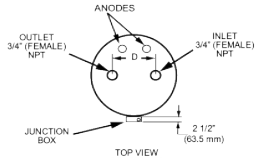
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

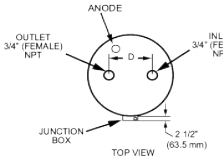


DIMENSIONS & SPECIFICATIONS

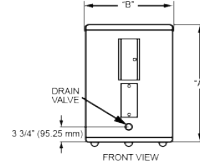
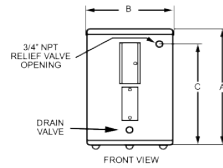
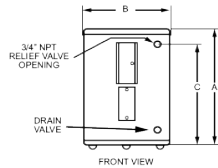
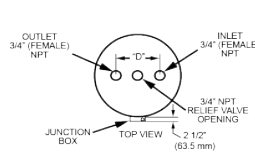
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models			Wattage Limits w/ Simultaneous Operation	
T	208V	1 or 3 PH	208V - 10,000W (5,000W/5,000W)	
P	240V	1 or 3 PH	240V - 10,000W (5,000W/5,000W)	
W	277V	1 PH	277V - 12,200W (6,100W/6,100W)	
X	480V	3 PH	480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule

Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)

Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2101. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



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300 Maddox Simpson Parkway
Lebanon, Tennessee 37090
P: 615.889.8900 / F: 615.547.1000

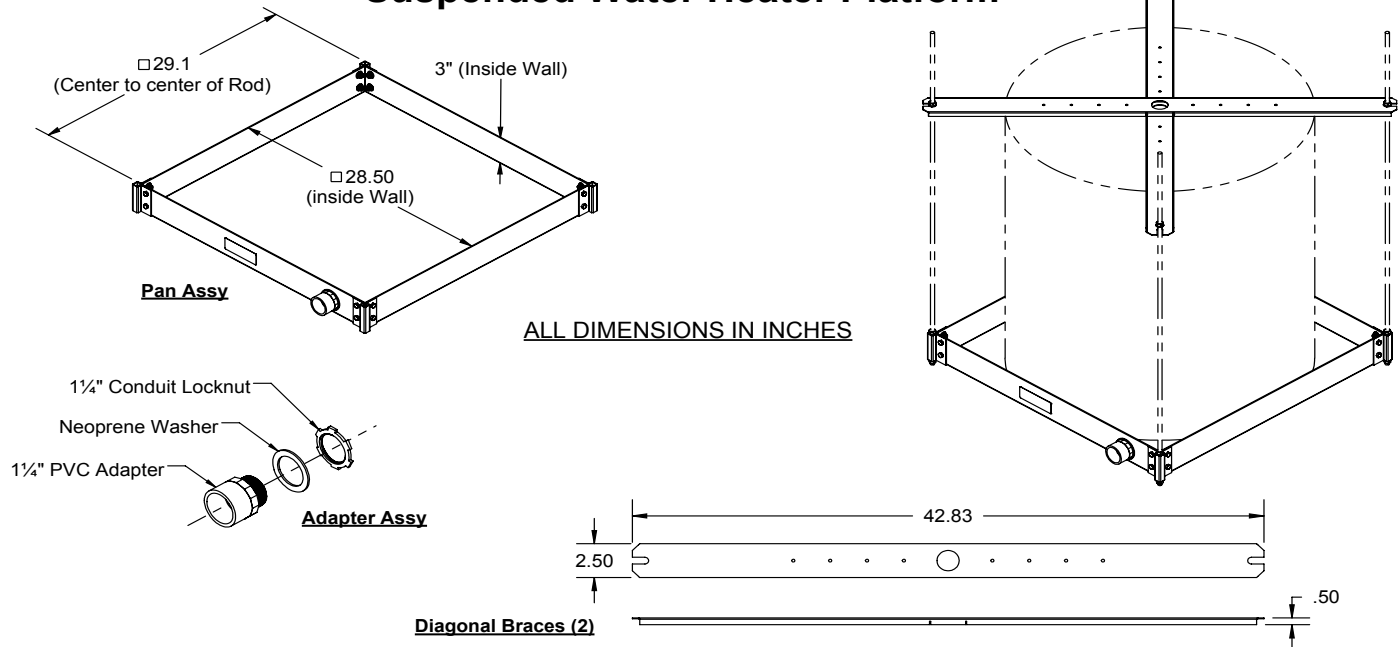
Lochinvar.com



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

PRODUCT SPECIFICATION DRAWING QUICK STAND™ #60-SWHP Suspended Water Heater Platform



The #60-SWHP Suspended Water Heater Platform is engineered to support water heaters up to 50 U.S. gallons, or other equipment, up to 750 pounds total weight. This time and labor savings tool is designed for the Professional Contractor. Design features requested by plumbers are incorporated into a professional platform and drain pan combination that can be suspended with 3/8" or 1/2" all thread rods. See Installation Instructions for detail.

Product Information:

- Material:
 - Pan: 12 gage CRS, galvanized
 - Corner Brackets: 14 gage CRS, galvanized
 - Diagonal Braces: 16 gage CRS, galvanized
- Wide platform allows water heaters up to 28-1/2" diameter
- Watertight corners and sealed 1/4" PVC drain fittings eliminate need for additional drain pan
- Cross-braces two (2) included to capture water heater within the platform
- Static load rating 750 pounds with 2X safety factor (depending on structural anchorage)
- Includes PVC drain body 1/4" MIPT x 1/4" FS
- Galvanized steel construction
- Suspends with user supplied 3/8" or 1/2" threaded rod and hardware
- Four corner attachment points allows for seismic/sway bracing connection
- Patent pending

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spec_60-SWHP_RevC

Product Submittal	
Job Name:	
Date:	
Part Number:	Qty:
Architect / Owner:	
Contractor:	
Notes:	



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-5

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

AUTOMATIC OVERHEAT PROTECTION - Provides automatic overheat safety control with manual reset high limit feature.

TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

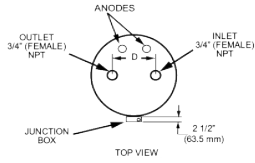
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

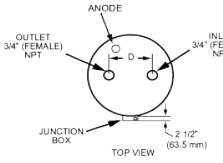


DIMENSIONS & SPECIFICATIONS

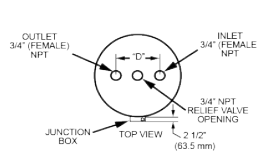
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule

Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)

Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2501. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



Lochinvar, LLC
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Lebanon, Tennessee 37090
P: 615.889.8900 / F: 615.547.1000

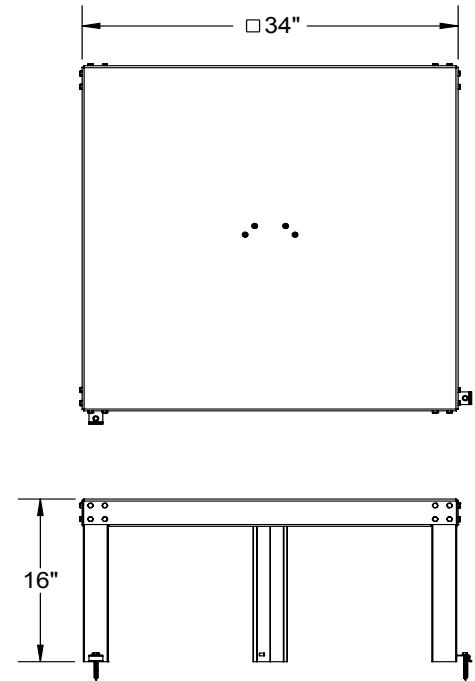
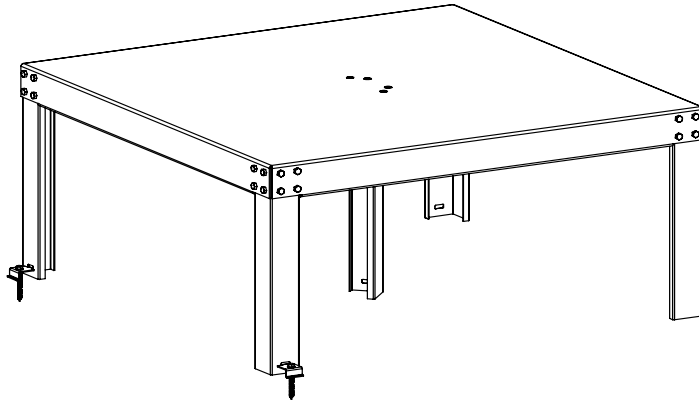
Lochinvar.com



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

PRODUCT SPECIFICATION DRAWING
QUICKSTAND™ 34" X 34" (Water Heater & Equipment Support)
#40-S-34-U (unassembled)



The QUICKSTAND™ #40-S-34-U stand safely elevates water heaters and other equipment above the floor (2,000 lbs rating).

ALL DIMENSIONS IN INCHES

Product Information:

- Material & Hardware:
 Top: 11GA CRS, Galvanized
 Attachment Bracket: 11GA CRS, Galvanized
 Leg: 16GA CRS, Galvanized, 5 places
 Safety Clip: 14GA CRS, Galvanized, 2 places
 Hex Bolt, #1/4-20 x 5/8"L, 36 places
 Screw, Machine, #1/4-20 X 5/8"L, SST, 100° Phillips Flat Head, 4 places
 Nut, Hex, #1/4-20, 40 places
 Washer, #1/4, External Tooth, Lock, 40 places
- Engineered and lab tested to meet Uniform Plumbing Code (UPC) and International Plumbing Code (IPC) requirements, including elevation of water heater's ignition source 18" above the floor
- Holds up to 2,000 pounds (typical 100 to 120 U.S. gallons plus)
- QUICKSTAND™ weight approximately 61 pounds without packaging
- Available in unassembled configuration ONLY

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 spec_40-S-34-U_RevA

Product Submittal	
Job Name:	
Date:	
Part Number:	Qty:
Architect / Owner:	
Contractor:	
Notes:	



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-6

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

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TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

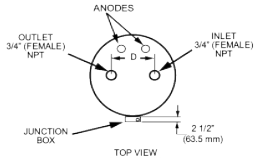
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

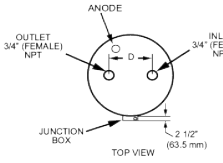


DIMENSIONS & SPECIFICATIONS

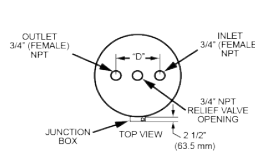
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models			Wattage Limits w/ Simultaneous Operation	
T	208V	1 or 3 PH	208V - 10,000W (5,000W/5,000W)	
P	240V	1 or 3 PH	240V - 10,000W (5,000W/5,000W)	
W	277V	1 PH	277V - 12,200W (6,100W/6,100W)	
X	480V	3 PH	480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
Light Duty	Short	50 gal	Capacity	Wattage

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule

Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)

Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2501. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



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Lebanon, Tennessee 37090
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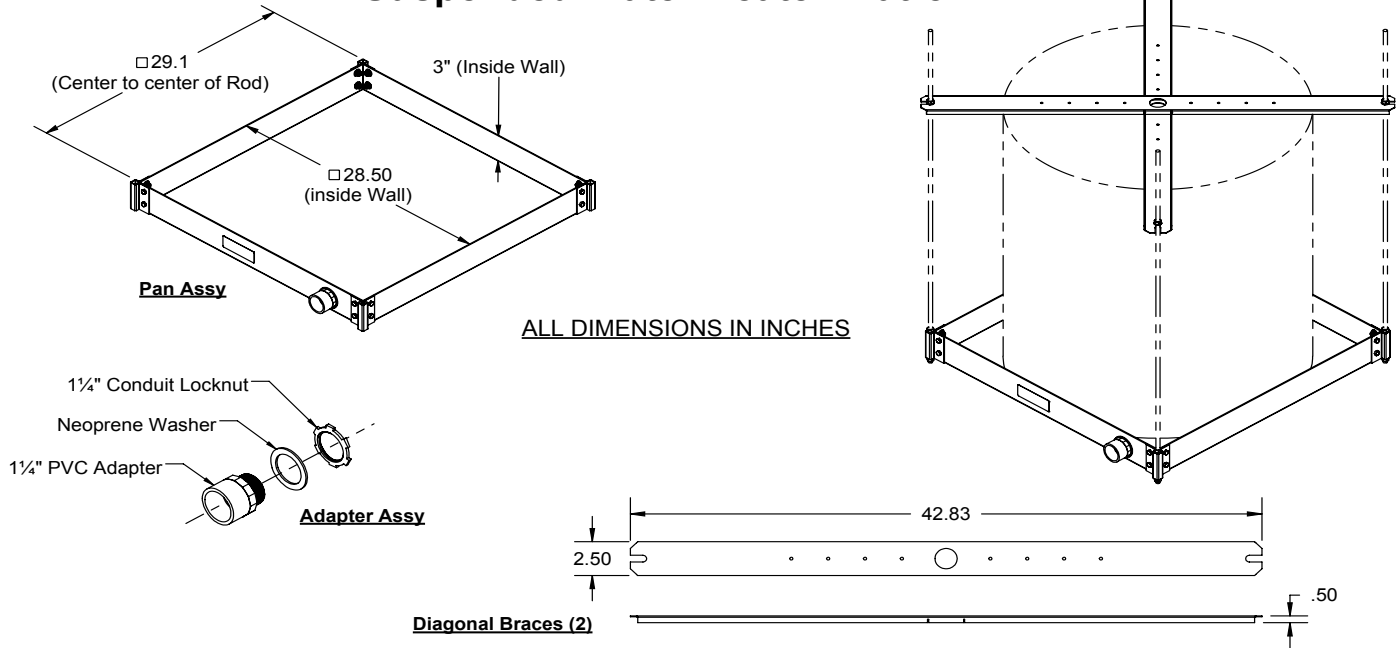
Lochinvar.com



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

PRODUCT SPECIFICATION DRAWING QUICK STAND™ #60-SWHP Suspended Water Heater Platform



The #60-SWHP Suspended Water Heater Platform is engineered to support water heaters up to 50 U.S. gallons, or other equipment, up to 750 pounds total weight. This time and labor savings tool is designed for the Professional Contractor. Design features requested by plumbers are incorporated into a professional platform and drain pan combination that can be suspended with 3/8" or 1/2" all thread rods. See Installation Instructions for detail.

Product Information:

- Material:
 - Pan: 12 gage CRS, galvanized
 - Corner Brackets: 14 gage CRS, galvanized
 - Diagonal Braces: 16 gage CRS, galvanized
- Wide platform allows water heaters up to 28-1/2" diameter
- Watertight corners and sealed 1 1/4" PVC drain fittings eliminate need for additional drain pan
- Cross-braces two (2) included to capture water heater within the platform
- Static load rating 750 pounds with 2X safety factor (depending on structural anchorage)
- Includes PVC drain body 1 1/4" MIPT x 1 1/4" FS
- Galvanized steel construction
- Suspends with user supplied 3/8" or 1/2" threaded rod and hardware
- Four corner attachment points allows for seismic/sway bracing connection
- Patent pending

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spec_60-SWHP_RevC

Product Submittal	
Job Name:	
Date:	
Part Number:	Qty:
Architect / Owner:	
Contractor:	
Notes:	



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-7

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

AUTOMATIC OVERHEAT PROTECTION - Provides automatic overheat safety control with manual reset high limit feature.

TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

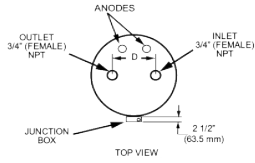
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

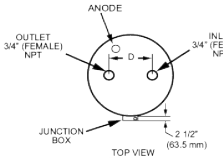


DIMENSIONS & SPECIFICATIONS

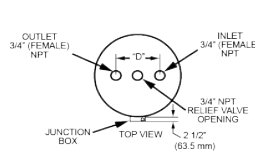
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.

* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule

Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)

Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2501. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



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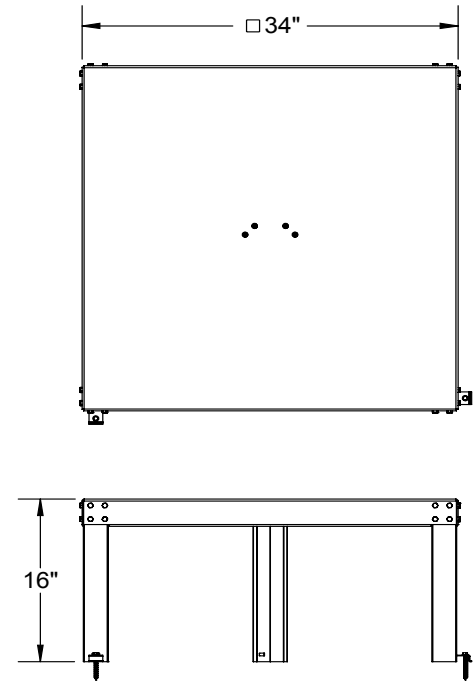
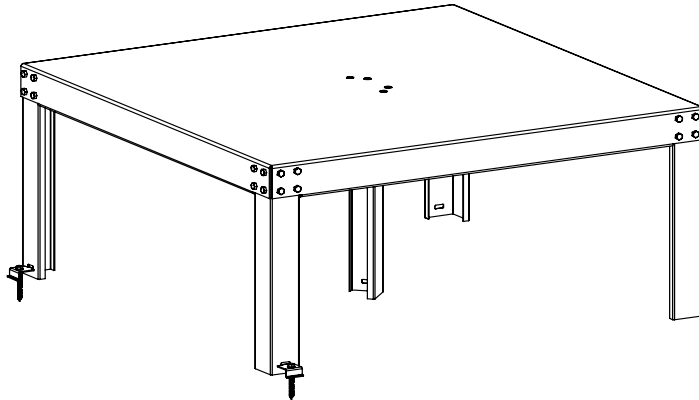
[Lochinvar.com](https://www.lochinvar.com)



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

PRODUCT SPECIFICATION DRAWING
QUICKSTAND™ 34" X 34" (Water Heater & Equipment Support)
#40-S-34-U (unassembled)



The QUICKSTAND™ #40-S-34-U stand safely elevates water heaters and other equipment above the floor (2,000 lbs rating).

ALL DIMENSIONS IN INCHES

Product Information:

- Material & Hardware:
 Top: 11GA CRS, Galvanized
 Attachment Bracket: 11GA CRS, Galvanized
 Leg: 16GA CRS, Galvanized, 5 places
 Safety Clip: 14GA CRS, Galvanized, 2 places
 Hex Bolt, #1/4-20 x 5/8"L, 36 places
 Screw, Machine, #1/4-20 X 5/8"L, SST, 100° Phillips Flat Head, 4 places
 Nut, Hex, #1/4-20, 40 places
 Washer, #1/4, External Tooth, Lock, 40 places
- Engineered and lab tested to meet Uniform Plumbing Code (UPC) and International Plumbing Code (IPC) requirements, including elevation of water heater's ignition source 18" above the floor
- Holds up to 2,000 pounds (typical 100 to 120 U.S. gallons plus)
- QUICKSTAND™ weight approximately 61 pounds without packaging
- Available in unassembled configuration ONLY

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 spec_40-S-34-U_RevA

Product Submittal	
Job Name:	
Date:	
Part Number:	Qty:
Architect / Owner:	
Contractor:	
Notes:	



2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-8

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

AUTOMATIC OVERHEAT PROTECTION - Provides automatic overheat safety control with manual reset high limit feature.

TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

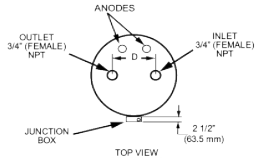
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

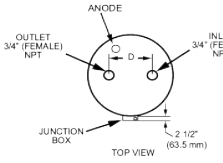


DIMENSIONS & SPECIFICATIONS

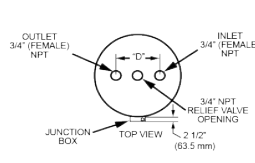
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100
	to LDT-120	Simultaneous			

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule					
Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)						
Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2501. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



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CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

Date/Rev: 10-02-23 / Rev G / Sht 1 of 1



Product Submittal	
Name	
Date	
Architect/Owner	
Contractor	
Tag	
Notes	

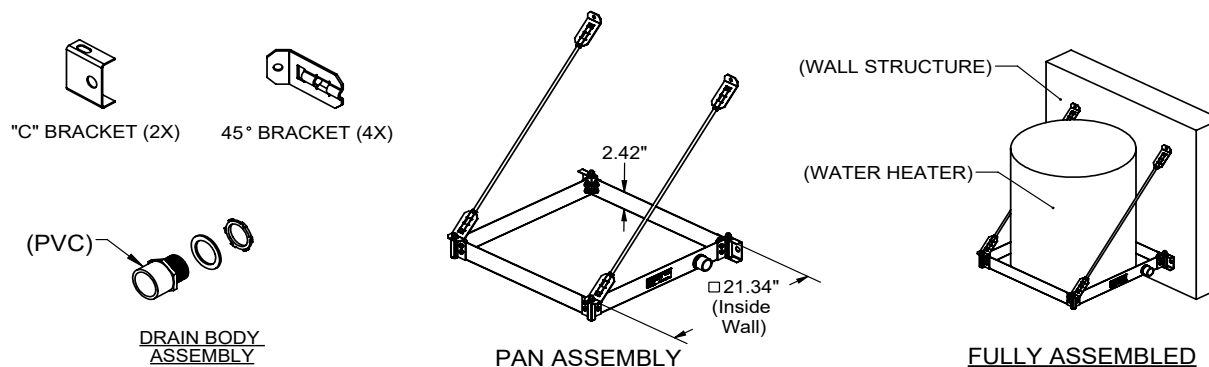
HoldRite QUICK STAND™ #40-SWHP-W Wall Mounted Equipment Platform

Product Specification Drawing

The #40-SWHP-W Wall Mounted Equipment Platform is engineered to support water heaters up to 20 U.S. gallons (or other equipment up to 375 pounds total weight) mounted to a wall. This item also serves as a drain pan. See Installation Instructions for detail.

Product Information:

- Material:
 - Pan: 14 gage CRS, galvanized
 - Corner Brackets (4): 14 gage CRS, galvanized
 - C-Brackets (2): 16 gage CRS, galvanized
 - 45° Brackets (4): 12 gage, CRS, galvanized
 - Threaded Rod (2): Low carbon steel, zinc plated, 3/8" x 29-3/4" long
- Wide platform allows water heaters up to 21-1/4" diameter
- Watertight corners and drain fittings eliminate need for additional drain pan
- Static load rating 375 pounds with 2X safety factor (depending on structural anchorage)
- Professional Engineer reviewed documentation available
- Includes PVC drain body 1" MIPT x 1" FS
- Galvanized steel construction
- Suspends with user supplied 3/8" hardware to mount to wall, 4 places
- Installation instructions for mounting to concrete or framed wall structure available



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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-9

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

AUTOMATIC OVERHEAT PROTECTION - Provides automatic overheat safety control with manual reset high limit feature.

TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

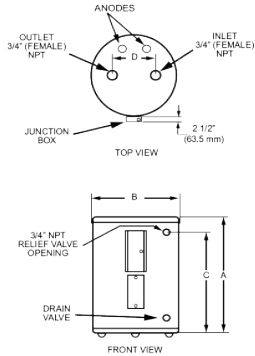
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

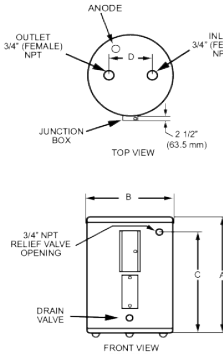


DIMENSIONS & SPECIFICATIONS

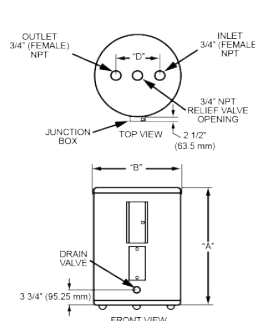
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

Model Number	Nominal Cap.	Rated Cap.	UEF	A	B	C	D	Ship Wt.
Short Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDS-30 XK	36	33	0.92	32"	24"	24"	8"	118
LDS-40 XK	38	35	0.92	32"	23"	24"	8"	118
LDS-50 XK	51	48	0.92	36"	26-1/2"	25"	8"	172
Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100
	to LDT-120	Simultaneous			

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule					
Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)						
Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2101. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



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CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

Date/Rev: 10-02-23 / Rev G / Sht 1 of 1



Product Submittal	
Name	
Date	
Architect/Owner	
Contractor	
Tag	
Notes	

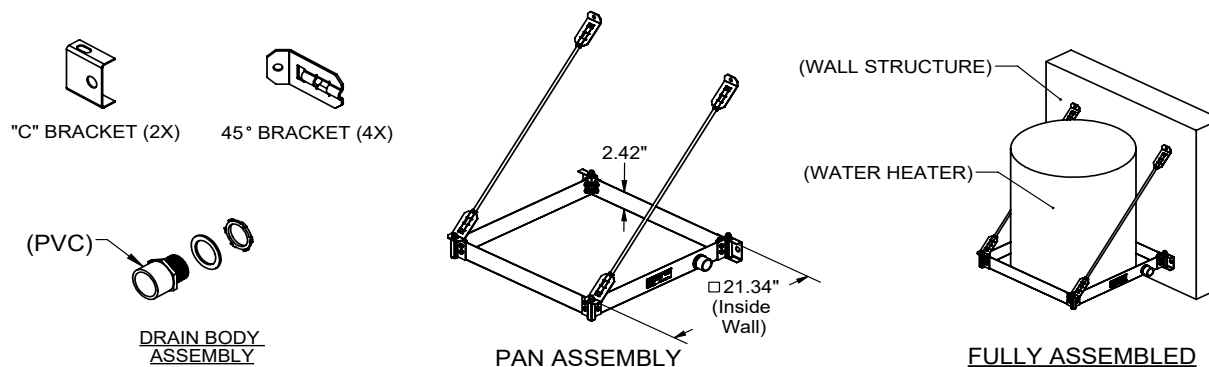
HoldRite QUICK STAND™ #40-SWHP-W Wall Mounted Equipment Platform

Product Specification Drawing

The #40-SWHP-W Wall Mounted Equipment Platform is engineered to support water heaters up to 20 U.S. gallons (or other equipment up to 375 pounds total weight) mounted to a wall. This item also serves as a drain pan. See Installation Instructions for detail.

Product Information:

- Material:
 - Pan: 14 gage CRS, galvanized
 - Corner Brackets (4): 14 gage CRS, galvanized
 - C-Brackets (2): 16 gage CRS, galvanized
 - 45° Brackets (4): 12 gage, CRS, galvanized
 - Threaded Rod (2): Low carbon steel, zinc plated, 3/8" x 29-3/4" long
- Wide platform allows water heaters up to 21-1/4" diameter
- Watertight corners and drain fittings eliminate need for additional drain pan
- Static load rating 375 pounds with 2X safety factor (depending on structural anchorage)
- Professional Engineer reviewed documentation available
- Includes PVC drain body 1" MIPT x 1" FS
- Galvanized steel construction
- Suspends with user supplied 3/8" hardware to mount to wall, 4 places
- Installation instructions for mounting to concrete or framed wall structure available



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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

EWH-10

COMMERCIAL WATER HEATERS

Available in point-of-use, tall and short models, Lochinvar's commercial electric water heaters offer a wide range of capacities and a choice of voltages. This flexibility—combined with their Energy Saver design and durable construction—makes them ideal for many low-draw commercial and industrial applications.

LIGHT DUTY ELECTRIC MODELS

STANDARD FEATURES

NON-SIMULTANEOUS OR SIMULTANEOUS WIRING - 30, 40 and 50 gallon models are factory wired for non-simultaneous operation, standard. 65, 80 and 120 gallon models are factory wired for simultaneous operation, standard. All Non-SIM and SIM models can be field converted.

GLASS-LINED STEEL TANK - The durable glass lining is fused to the tank at 1,600°F to assure lasting protection against rust and corrosion while providing clean, clear hot water. 300 psi test pressure; 150 psi working pressure.

NON-CFC FOAM INSULATION - A uniform coverage of thick closed-cell foam insulation minimizes standby losses and maximizes heat retention.

ADJUSTABLE THERMOSTATS - This accurate control provides an easy way to reset water temperature for best economy.

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TANK SAVER ANODE - A large diameter, high capacity anode inhibits corrosion of the tank interior for long, trouble-free service.

SINGLE OR THREE PHASE WIRING - Wired for 3-phase operation standard. Field adjustable to 1-phase.

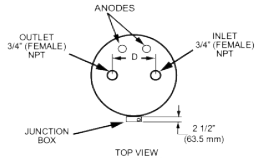
ASME TEMPERATURE & PRESSURE RELIEF VALVE - Factory installed for safety.

3-YEAR LIMITED TANK WARRANTY, 1-YEAR LIMITED PARTS WARRANTY – See warranty for details.

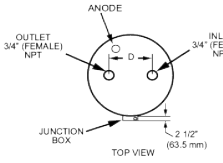


DIMENSIONS & SPECIFICATIONS

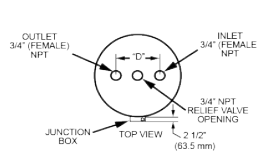
LDS-30 XK - LDS-50 XK



LDT-30 XK - LDT-50 XK



LDT-65 XR - LDT-120 XR



LDS & LDT Models		
T	208V	1 or 3 PH
P	240V	1 or 3 PH
W	277V	1 PH
X	480V	3 PH

Wattage Limits w/ Simultaneous Operation	
208V - 10,000W (5,000W/5,000W)	
240V - 10,000W (5,000W/5,000W)	
277V - 12,200W (6,100W/6,100W)	
480V - 12,200W (6,100W/6,100W)	

Wattage Limits applicable to 30, 40 & 50 gal Short and 30, 40 & 50 gal Tall.

FOR EASE IN ORDERING
BY MODEL NUMBER

LD	S	50	X	K
LIGHT DUTY	SHORT	TANK CAPACITY	VOLTAGE	WATTAGE

This is a Short Commercial Electric 480 volt model with a tank capacity of 50 gallons. The upper and lower elements are 4500 watts.

LIGHT DUTY COMMERCIAL MODELS

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Tall Models / Dual Elements, Multiple Element Wattages, Non-Simultaneous								
LDT-30 XK	40	37	0.92	49-3/4"	20-1/2"	53-1/4"	8"	118
LDT-40 XK	50	46	0.92	59"	20-1/2"	51-1/4"	8"	125
LDT-50 XK	55	55	0.92	56-1/2"	24"	48-1/2"	8"	145
Tall Models / Dual Elements, 6100 Watt Elements Only, Simultaneous								
LDT-65 XR	66	60	N/A	60-3/4"	21-3/4"	-	8"	176
LDT-80 XR	80	76	N/A	59-3/8"	24"	-	8"	211
LDT-120 XR	120	108	N/A	62-7/16"	29-3/8"	-	8"	326

Notes: Water connections 3/4" NPT on all models. Short and Tall models are factory wired for three phase service and are field converted to single phase.

Models		T - 208V/ 1 or 3PH	P - 240V/ 1 or 3PH	W - 277V/ 1PH	X - 480V/ 3PH
LDS-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-40	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDS-50	Min Wattage	4000	4000	4000	4000
	Max Wattage	6000*	6000*	6000	6000
LDT-30	Min Wattage	4500	4500	4500	4500
	Max Wattage	6000*	6000*	6000	6000
LDT-40	Min Wattage	3000	3000	3000	3000
	Max Wattage	6000*	6000*	6000	6000
LDT-50	Min Wattage	2500	2500	2500	2500
	Max Wattage	6000*	6000*	6000	6000
LDT-65	Single Wattage/	N/A	6100	6100	6100

to LDT-120 Simultaneous

See "Element Availability Schedule" for letter codes and available voltage/wattage combinations.
* Simultaneous operation is not available for 6000 watt models.

Element Availability Schedule					
Wattage	120V**	208V**	240V	277V	480V
Non-Simultaneous					
F-2500	Yes	Yes	Yes	Yes	Yes
G-3000	Yes	Yes	Yes	Yes	Yes
H-3500	N/A	Yes	Yes	N/A	N/A
J-4000	N/A	Yes	Yes	Yes	Yes
K-4500	N/A	Yes	Yes	Yes	Yes
M-5000	N/A	Yes	Yes	Yes	Yes
N-5500	N/A	Yes*	Yes*	N/A	N/A
P-6000	N/A	Yes*	Yes*	Yes	Yes
Simultaneous					
R-6100	N/A	N/A	Yes	Yes	Yes

* Simultaneous operation is not available for 5500 & 6000 watt models.

Notes: Max Wattage for EJ-006 is 3000W

* Indicates Not Available for EJ-010 and EJ-015

**LDT-65, 80 & 120 not available in 120 & 208V

Recovery Rate (GPH @ °F)						
Element	Wattage	40°F	60°F	80°F	100°F	120°F
Non-Simultaneous						
F	2500	26	17	13	10	8
G	3000	30	20	15	12	10
H	3500	36	34	18	14	12
J	4000	41	27	20	16	14
K	4500	46	30	23	18	15
M	5000	51	34	25	20	17
N	5500	56	38	28	22	19
P	6000	61	41	30	24	20
Simultaneous						
R-6100	12200	124	82	62	49	41

For technical information call 800-722-2501. Lochinvar, LLC reserves the right to make product changes or improvements without prior notice.



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Lochinvar.com



CLD-09 (Replaces CLD-08 8/22)

(Website Update 7/24) 9/22 - Printed in USA

Date/Rev: 10-02-23 / Rev G / Sht 1 of 1



Product Submittal	
Name	
Date	
Architect/Owner	
Contractor	
Tag	
Notes	

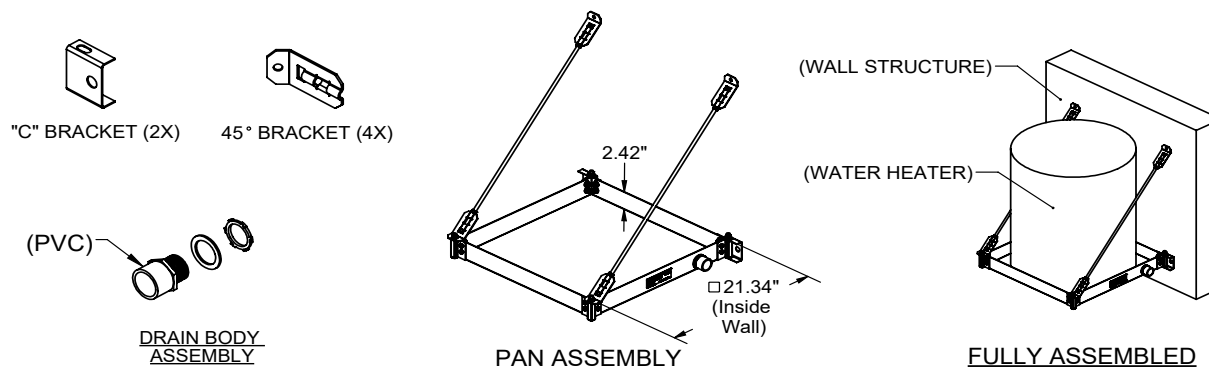
HoldRite QUICK STAND™ #40-SWHP-W Wall Mounted Equipment Platform

Product Specification Drawing

The #40-SWHP-W Wall Mounted Equipment Platform is engineered to support water heaters up to 20 U.S. gallons (or other equipment up to 375 pounds total weight) mounted to a wall. This item also serves as a drain pan. See Installation Instructions for detail.

Product Information:

- Material:
 - Pan: 14 gage CRS, galvanized
 - Corner Brackets (4): 14 gage CRS, galvanized
 - C-Brackets (2): 16 gage CRS, galvanized
 - 45° Brackets (4): 12 gage, CRS, galvanized
 - Threaded Rod (2): Low carbon steel, zinc plated, 3/8" x 29-3/4" long
- Wide platform allows water heaters up to 21-1/4" diameter
- Watertight corners and drain fittings eliminate need for additional drain pan
- Static load rating 375 pounds with 2X safety factor (depending on structural anchorage)
- Professional Engineer reviewed documentation available
- Includes PVC drain body 1" MIPT x 1" FS
- Galvanized steel construction
- Suspends with user supplied 3/8" hardware to mount to wall, 4 places
- Installation instructions for mounting to concrete or framed wall structure available



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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

CP-1



ASTRO 2 | THREE SPEED CIRCULATORS | SUBMITTAL

File No: 10.584
 Date: MARCH 03, 2017
 Supersedes: 10.584
 Date: APRIL 03, 2014

Job: _____ Representative: _____
 _____ Ordered by: _____ Date: _____
 Engineer: _____ Submitted by: _____ Date: _____
 Contractor: _____ Approved by: _____ Date: _____

TECHNICAL DATA

Certification: ETL listed for US and Canada (conforms to UL STD. 778 certified to CSA STD. C22.2 NO.108-01)
 NSF 372 (for lead free bronze and stainless steel models)

Flow range: 0 - 64 USgpm / 0 - 4.04 l/s

Head range: 0 - 42.0 feet / 0 - 12.8 meters

Maximum fluid temperature: 185°F / 85°C (Astro 286 up to 1.35A)
 150°F / 65°C (Astro 286 over 1.35A)
 230°F / 110°C† (all others)

Maximum working pressure: 150 psi / 1034 kPa

MATERIALS OF CONSTRUCTION

Pump body: Cast iron (closed systems)
 Lead free bronze* (open systems)
 Stainless steel* (open systems)

Impeller: Noryl

Shaft: Ceramic

Bearings: Ceramic

Gasket material: EPDM

DIMENSIONS AND WEIGHTS

LEAD FREE BRONZE*	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 225BS ½" SWT	5.00 (127)	5.00 (127)	4.13 (105)	—	3.10 (79)	—	Sweat - ½"	6.0 (2.7)
Astro 225BS ¾" SWT	5.00 (127)	5.00 (127)	4.13 (105)	—	3.10 (79)	—	Sweat - ¾"	6.0 (2.7)
STAINLESS STEEL*	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 220SSU**	6.00 (152)	5.00 (127)	4.00 (102)	—	3.10 (79)	—	Union - 1¼" NPSM	6.5 (2.9)
Astro 225SSU**	6.00 (152)	5.00 (127)	4.00 (102)	—	3.10 (79)	—	Union - 1¼" NPSM	6.5 (2.9)
Astro 230SS**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250SS**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 210SS**	6.50 (165)	7.25 (184)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 280SS (230V)**	6.50 (165)	6.75 (171)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 286SS**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 290SS**	8.50 (216)	6.65 (169)	5.20 (132)	4.00 (102)	3.60 (91)	3.45 (88)	Flange - (2) ½" dia. bolt holes	13.2 (6.0)
CAST IRON	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 230CI**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 230CI-R**	6.38 (162)	5.63 (137)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250CI**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250CI-R**	6.38 (162)	5.63 (137)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 210CI**	6.50 (165)	7.25 (184)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 280CI (230V)**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 286CI**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 290CI**	8.50 (216)	6.65 (169)	5.20 (132)	4.00 (102)	3.60 (91)	3.45 (88)	Flange - (2) ½" dia. bolt holes	13.2 (6.0)

NOTE: All dimensions are in inches (mm) and weights in lbs (kg).

* Certified <0.25 weighted average percent lead and complies with California Health and Safety Code Section 116875 (commonly known as AB 1953).

** Removable check valve installed at pump outlet.

† For open systems, it is recommended that the fluid temperature be less than 150°F (66°C) to avoid precipitation of calcium.

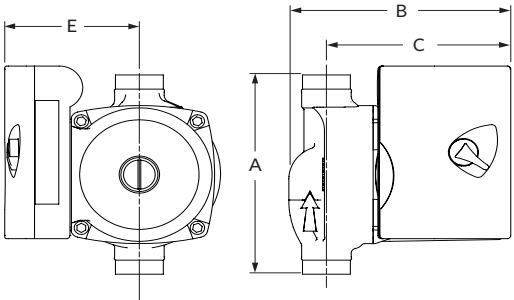
SUBMITTAL Astro 2
3-speed circulator models

2

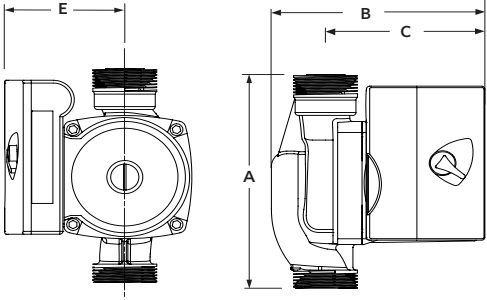
MOTOR DATA

MODEL	ELECTRICAL INPUT	SPEED	FULL LOAD AMP DRAW (A)	NOMINAL POWER (W)
ASTRO 210CI/SS		3	1.06	200
		2	1.50	
		1	1.72	
ASTRO 220SSU		3	0.29	33
		2	0.27	
		1	0.20	
ASTRO 225BS		3	0.64	75
		2	0.49	
		1	0.38	
ASTRO 225SSU		3	0.69	83
		2	0.55	
		1	0.43	
ASTRO 230SS/CI/CI-R	115V, 60HZ Single phase	3	0.81	97
		2	0.58	
		1	0.45	
ASTRO 250SS/CI/CI-R		3	0.98	117
		2	0.79	
		1	0.65	
ASTRO 280CI/SS		3	1.90	218
		2	1.80	
		1	1.50	
ASTRO 290CI/SS		3	1.90	218
		2	1.60	
		1	1.40	
ASTRO 280CI/SS 230V	230V, 60HZ Single phase	3	0.90	210
		2	0.86	
		1	0.80	
ASTRO 286CI/SS		1	1.60	370

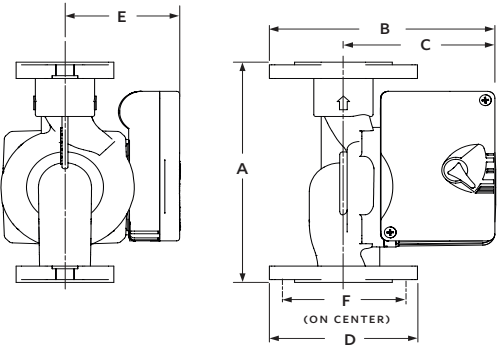
ASTRO 225BS



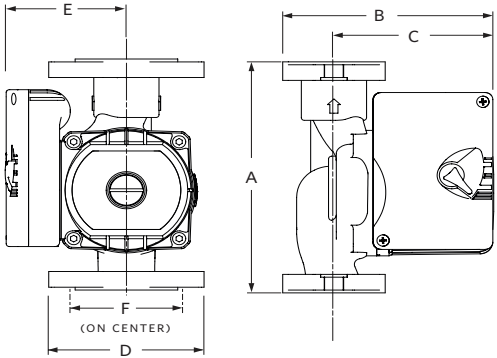
ASTRO 220SSU & 225SSU



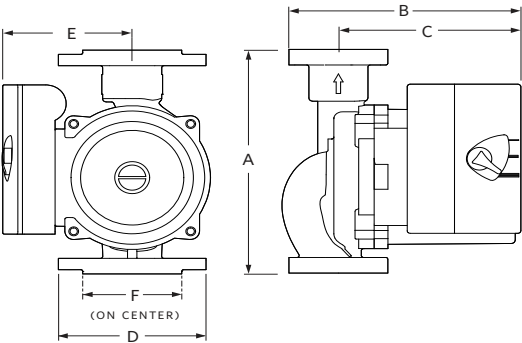
ASTRO 230SS/CI & 250SS/CI



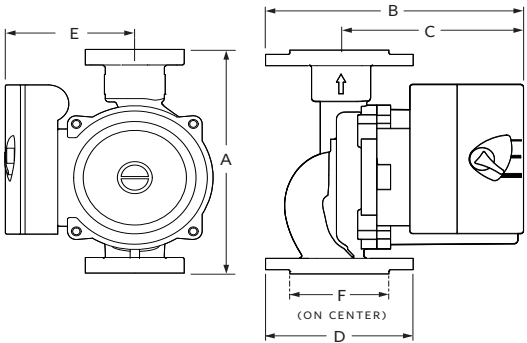
ASTRO 230CI-R & 250CI-R



ASTRO 280CI, 290CI/SS & 286CI/SS



ASTRO 210CI/SS & 280SS



HARDWARE KIT

Companion flange kit (contains two (2) flanges, hardware and gaskets)

Cast iron: 0.75", 1", 1.25", 1.5"

Bronze: 0.75", 1", 1.25", 1.5"

Union fitting (contains two (2) half unions and gaskets)

1.25" NPSM to:

Brass/Lead free bronze: 0.5" sweat, 0.75" sweat, 0.75" FNPT

CHECK VALVE SIZE

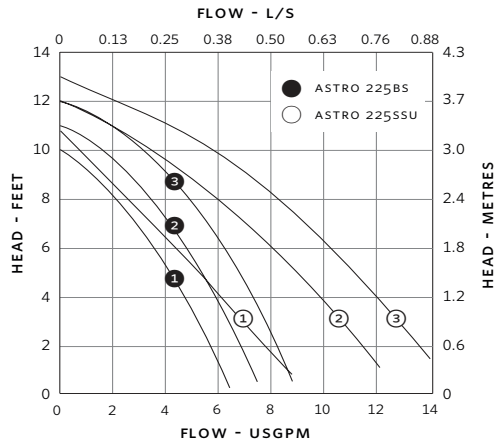
CHECK VALVE SIZE	MODEL
1" Diameter	ASTRO 220SSU, ASTRO 225SSU
1¼" Diameter	ASTRO 210, ASTRO 230, ASTRO 250, ASTRO 280, ASTRO 286
1½" Diameter	ASTRO 290

SUBMITTAL Astro 2
3-speed circulator models

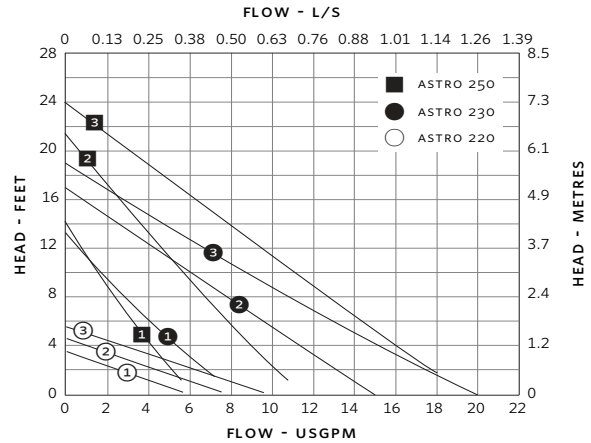
4

PERFORMANCE CURVES

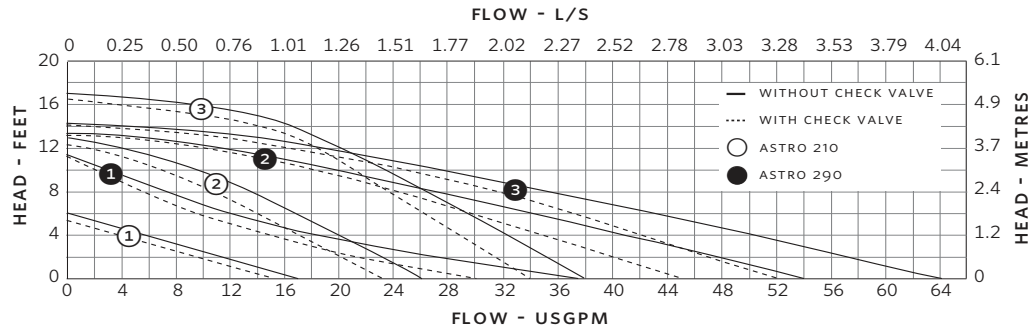
ASTRO 225BS, 225SSU



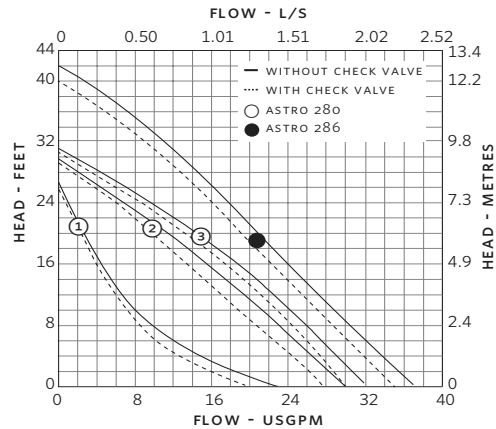
ASTRO 220, 230, 250



ASTRO 210, 290



ASTRO 280, 286



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24-HOUR TIMER AND AQUASTAT CONTROL ACCESSORY FOR ASTRO 2 | INSTALLATION AND OPERATING INSTRUCTIONS

File No: 11.871
Date: FEBRUARY 24, 2017
Supersedes: 11.871
Date: JULY 16, 2015

1.0	Timer application	1	6.0	Aquastat control accessory	2
2.0	Installation	1	7.0	Aquastat installation	3
3.0	Timer and aquastat application	1	8.0	Timer and aquastat installation	3
4.0	24-Hour timer	2	9.0	Timer programming with manual override switch	3
5.0	Timer installation	2			

1.0 TIMER APPLICATION

The Armstrong 24-hour timers provide On/Off pump control according to preset operating times in order to increase comfort and improve the overall efficiency of domestic hot water re-circulation systems. The 24-hour timers are designed for use with Armstrong circulators installed in indoor hot water re-circulation applications.

Typical timer applications will cycle the pump at preset times, allowing the user to select operation of the circulating pump during high peak usage periods in order to decrease the delivery time to outlet fixtures and reduce wasted water.

The timer control is programmable to ¼ hour intervals within a 24-hour time frame utilizing a user friendly analog clock timer with hour and minute hands, two directional arrows, and AM/PM time setting.



3.0 TIMER AND AQUASTAT APPLICATION

The 24-hour timer and aquastat can also be used together giving a comprehensive time and temperature actuated pump control in a domestic hot water re-circulation system. Typical application of the timer and aquastat combination will circulate water only when both time and temperature on conditions are initiated.

TIMER FEATURES

- Easy to install and program
- Time actuated 24-hour on/off pump control
- Hour and minute time setting with AM/PM function
- Manual override switch modes
- Rugged construction - steel enclosure
- Clear plastic cover for dust and moisture protection of the clock face
- Designed specifically for hot water re-circulation applications
- UL Listed



TIMER FEATURES

- Easy to install
- Temperature actuated pump control
- Environmentally sealed enclosure
- Surface sensing through snap acting bimetalic disc
- UL Listed

2.0 AQUASTAT APPLICATION

An optional aquastat is available for constant circulation applications to maintain temperature between 85°F and 105°F (29°C and 41°C). The Armstrong aquastat control accessory is designed for use with Astro Series wet rotor circulators in potable hot water re-circulation installations.

The aquastat control automatically turns the circulator on when the temperature in the hot water line falls below approximately 85°F (ON condition - for example when there is low demand on the hot water supply). The control turns it off again when the temperature exceeds 105°F (OFF condition - as in the case of periods with high demand).



4.0 24-HOUR TIMER

TECHNICAL DATA

Description	24-Hour Timer
Application	Time actuated On/Off pump control
Shortest Switching Interval	¼ hour (15 minutes)
Manual Switch Modes	"Timer", "ON" Override, "OFF" Override

INSTALLATION & OPERATING INSTRUCTIONS

24-hour Timer and Aquastat control accessory for Astro 2

2

TECHNICAL DATA	
Ambient Temperature Range	-40°F to 180°F (-40°C to 82°C)
Power Consumption	120 V, 0.5 W
Supply Voltage	110-120 VAC, 60 Hz
Terminals	¼" spade terminals
Weight	Approximately 3 oz.

5.0 TIMER INSTALLATION

WARNING



Electrical shock hazard - Verify that the electrical rating of the device matches the values shown on the nameplate of the circulator. All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electric Code, local codes and regulations. Failure to follow these instructions could result in serious injury, death and/ or property damage.

WARNING



Risk of electric shock – This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Note: Steps 1 & 3 apply to retrofit installations.

- 1 Disconnect the electrical supply to the circulator
Note: Numerical component designations included in Steps 2 through 8 refer to circulator and timer components shown in **FIG. 1**.
- 2 Unfasten the mounting 2 screws (4) and remove the terminal box cover (3).
- 3 Disconnect wire leads from the power supply.
- 4 Connect power supply wires (black, white and green) to the timer unit and to the circulator terminals (as shown in **FIG. 2**).
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 5 Place the timer box cover (5) using the 2 mounting screws (4). Insure that all lead wires are inside the timer assembly.
- 6 Program the timer according to instructions provided on page 6.
- 7 Connect the unit to electrical supply.
- 8 Start the circulator.

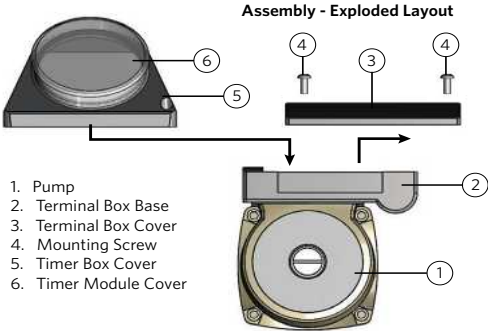


FIG. 1 Astro 2 Series circulator and 24-Hour Timer assembly drawing

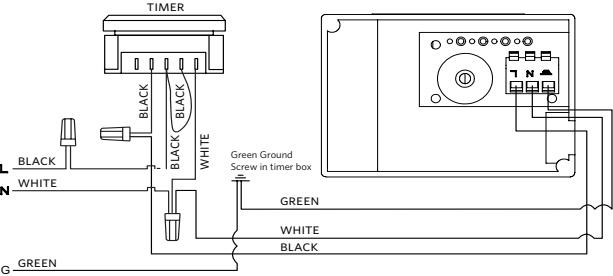


FIG. 2 Astro 2 Series circulator and 24-Hour Timer wiring diagram

6.0 AQUASTAT CONTROL ACCESSORY

TECHNICAL DATA	
Description	Aquastat (thermostatic) switch
Type	Surface sensing, snap acting bimetallic disc
Enclosure	Environmentally sealed
Switch modes*	105 ± 5°F (40 ± 2°C) pump switches OFF 85 ± 6°F (29 ± 3°C) pump switches ON
Contact position	Normally open
Mounting	½": Clip-on type for ⅝" o.d. system piping size (i.e., ½" I.D. copper tubing or ¾" steel pipe) ¾": Clip-on type for ⅞" o.d. system piping size (i.e., ¾" I.D. copper tubing or ½" steel pipe) May be mounted on either the inlet or outlet piping of the circulator.
Lead length	14" (356 mm)

*Temperatures indicated are at pipe surface

7.0 AQUASTAT INSTALLATION

- 1 Follow Steps 1, 2 and 3 in the Timer Installation section
- 2 The aquastat control is a surface temperature sensing device that must be in contact with the system piping to operate properly. Separate models include clip-on mounts for 3/4" (7/8" o.d.) and 1/2" (5/8" o.d.) copper tubing. (See FIG. 3)
- 3 Connect the black, green and white lead wires according to the wiring diagram (FIG. 4)
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 4 Close the terminal box cover and fasten the screw

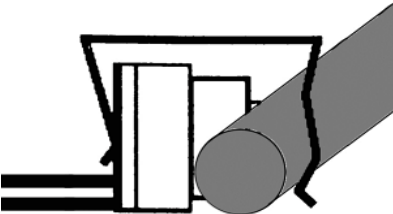


FIG. 3

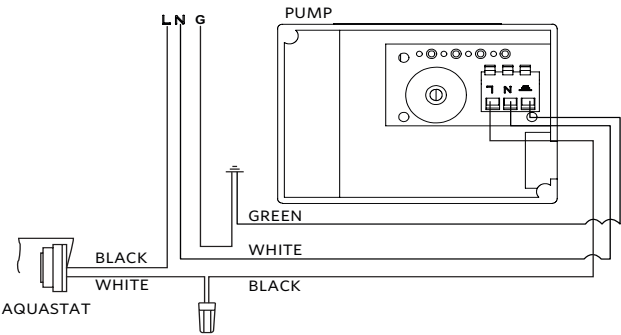


FIG. 4 Astro 2 Series circulator with Aquastat Control wiring diagram

8.0 TIMER AND AQUASTAT INSTALLATION

Follow the installation steps in both the Timer and Aquastat installation instructions and refer to Fig. 5 for the wiring connections.

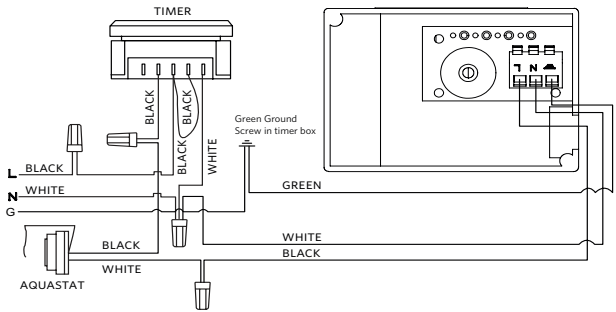


FIG. 5 Astro 2 Series circulator with 24-Hour Timer and Aquastat Control wiring diagram

9.0 TIMER PROGRAMMING WITH MANUAL
OVERRIDE SWITCH

Automatic Mode

In order to operate the time switch in the automatic mode, the manual switch must be in the center position. (See FIG. 6)

Manual Mode

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "o", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed. (See FIG. 6)

OVERRIDE MODE

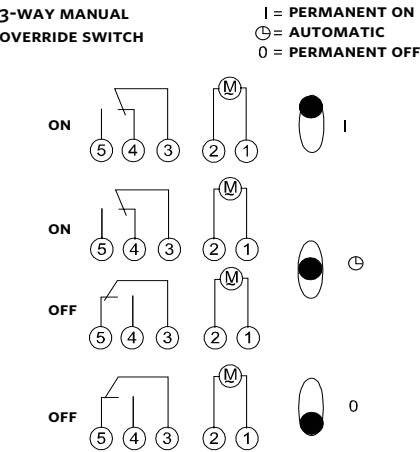


FIG. 6

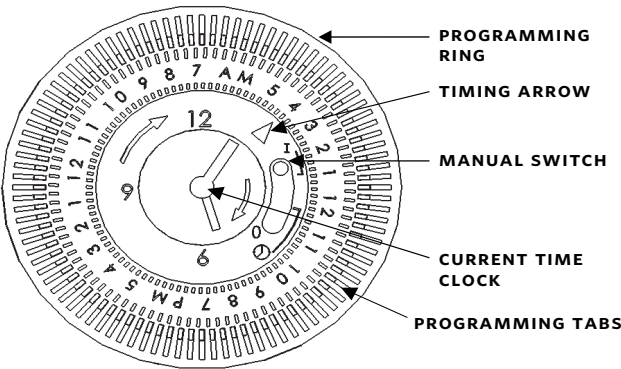
INSTALLATION &
OPERATING INSTRUCTIONS

24-hour Timer and Aquastat
control accessory for Astro 2

4

TIMER PROGRAMMING

1. Set the current time by turning the programming ring clock-wise until the timing arrow points to the current time of day.
 2. Restore power to the circulator and set the manual switch on the timer dial to the "ON" position ("I").
 3. Set the required "ON/OFF" times by pushing the programming tabs to the outer position for "ON" time intervals. For "OFF" ("O") operation keep the programming tabs in the inner position.
 4. Set the manual switch to the center position, between the "I" and "O" on the timer dial in order to cycle the pump according to the programming tab settings. The pump will run continuously when the switch is set to "I" (ON) position. The "O" (OFF) position of the switch will shut the circulator off at all times.
 5. In the event of power outage, the timer must be adjusted for the correct time of day after power is restored.
- Note:** The 24-hour timer requires manual resetting for daylight savings time.



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24-HOUR TIMER AND AQUASTAT CONTROL
ACCESSORY FOR ASTRO 2 | INSTALLATION AND
OPERATING INSTRUCTIONS

File No: 11.871
Date: FEBRUARY 24, 2017
Supersedes: 11.871
Date: JULY 16, 2015

1.0	Timer application	1	6.0	Aquastat control accessory	2
2.0	Installation	1	7.0	Aquastat installation	3
3.0	Timer and aquastat application	1	8.0	Timer and aquastat installation	3
4.0	24-Hour timer	2	9.0	Timer programming with manual override switch	3
5.0	Timer installation	2			

1.0 TIMER APPLICATION

The Armstrong 24-hour timers provide On/Off pump control according to preset operating times in order to increase comfort and improve the overall efficiency of domestic hot water re-circulation systems. The 24-hour timers are designed for use with Armstrong circulators installed in indoor hot water re-circulation applications.

Typical timer applications will cycle the pump at preset times, allowing the user to select operation of the circulating pump during high peak usage periods in order to decrease the delivery time to outlet fixtures and reduce wasted water.

The timer control is programmable to ¼ hour intervals within a 24-hour time frame utilizing a user friendly analog clock timer with hour and minute hands, two directional arrows, and AM/PM time setting.



3.0 TIMER AND AQUASTAT APPLICATION

The 24-hour timer and aquastat can also be used together giving a comprehensive time and temperature actuated pump control in a domestic hot water re-circulation system. Typical application of the timer and aquastat combination will circulate water only when both time and temperature on conditions are initiated.

- TIMER FEATURES**
- Easy to install and program
 - Time actuated 24-hour on/off pump control
 - Hour and minute time setting with AM/PM function
 - Manual override switch modes
 - Rugged construction - steel enclosure
 - Clear plastic cover for dust and moisture protection of the clock face
 - Designed specifically for hot water re-circulation applications
 - UL Listed



2.0 AQUASTAT APPLICATION

An optional aquastat is available for constant circulation applications to maintain temperature between 85°F and 105°F (29°C and 41°C). The Armstrong aquastat control accessory is designed for use with Astro Series wet rotor circulators in potable hot water re-circulation installations.

The aquastat control automatically turns the circulator on when the temperature in the hot water line falls below approximately 85°F (ON condition - for example when there is low demand on the hot water supply). The control turns it off again when the temperature exceeds 105°F (OFF condition - as in the case of periods with high demand).



- TIMER FEATURES**
- Easy to install
 - Temperature actuated pump control
 - Environmentally sealed enclosure
 - Surface sensing through snap acting bimetalic disc
 - UL Listed

4.0 24-HOUR TIMER

TECHNICAL DATA	
Description	24-Hour Timer
Application	Time actuated On/Off pump control
Shortest Switching Interval	¼ hour (15 minutes)
Manual Switch Modes	"Timer", "ON" Override, "OFF" Override

INSTALLATION & OPERATING INSTRUCTIONS

24-hour Timer and Aquastat control accessory for Astro 2

2

TECHNICAL DATA	
Ambient Temperature Range	-40°F to 180°F (-40°C to 82°C)
Power Consumption	120 V, 0.5 W
Supply Voltage	110-120 VAC, 60 Hz
Terminals	¼" spade terminals
Weight	Approximately 3 oz.

5.0 TIMER INSTALLATION

WARNING

 Electrical shock hazard - Verify that the electrical rating of the device matches the values shown on the nameplate of the circulator. All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electric Code, local codes and regulations. Failure to follow these instructions could result in serious injury, death and/ or property damage.

WARNING

 **Risk of electric shock** – This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Note: Steps 1 & 3 apply to retrofit installations.

- 1 Disconnect the electrical supply to the circulator
Note: Numerical component designations included in Steps 2 through 8 refer to circulator and timer components shown in **FIG. 1**.
- 2 Unfasten the mounting 2 screws (4) and remove the terminal box cover (3).
- 3 Disconnect wire leads from the power supply.
- 4 Connect power supply wires (black, white and green) to the timer unit and to the circulator terminals (as shown in **FIG. 2**).
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 5 Place the timer box cover (5) using the 2 mounting screws (4). Insure that all lead wires are inside the timer assembly.
- 6 Program the timer according to instructions provided on page 6.
- 7 Connect the unit to electrical supply.
- 8 Start the circulator.

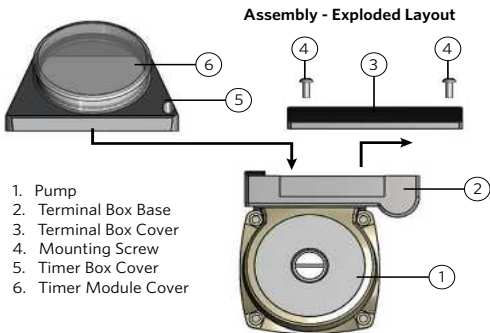


FIG. 1 Astro 2 Series circulator and 24-Hour Timer assembly drawing

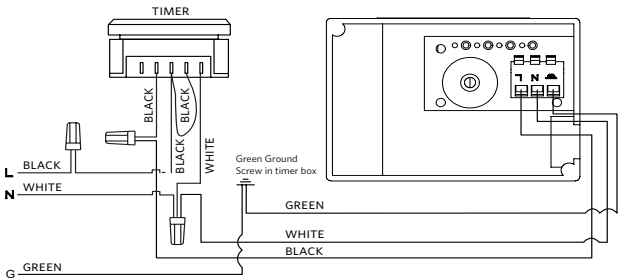


FIG. 2 Astro 2 Series circulator and 24-Hour Timer wiring diagram

6.0 AQUASTAT CONTROL ACCESSORY

TECHNICAL DATA	
Description	Aquastat (thermostatic) switch
Type	Surface sensing, snap acting bimetallic disc
Enclosure	Environmentally sealed
Switch modes*	105 ± 5°F (40 ± 2°C) pump switches OFF 85 ± 6°F (29 ± 3°C) pump switches ON
Contact position	Normally open
Mounting	½": Clip-on type for ⅝" o.d. system piping size (i.e., ½" I.D. copper tubing or ¾" steel pipe) ¾": Clip-on type for ⅞" o.d. system piping size (i.e., ¾" I.D. copper tubing or ½" steel pipe) May be mounted on either the inlet or outlet piping of the circulator.
Lead length	14" (356 mm)

*Temperatures indicated are at pipe surface

7.0 AQUASTAT INSTALLATION

- 1 Follow Steps 1, 2 and 3 in the Timer Installation section
- 2 The aquastat control is a surface temperature sensing device that must be in contact with the system piping to operate properly. Separate models include clip-on mounts for 3/4" (7/8" o.d.) and 1/2" (5/8" o.d.) copper tubing. (See FIG. 3)
- 3 Connect the black, green and white lead wires according to the wiring diagram (FIG. 4)
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 4 Close the terminal box cover and fasten the screw

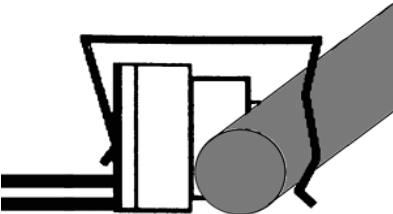


FIG. 3

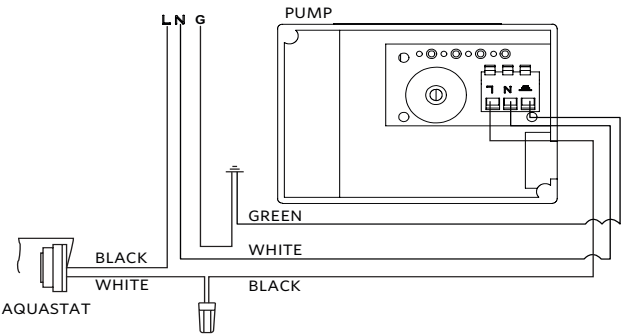


FIG. 4 Astro 2 Series circulator with Aquastat Control wiring diagram

8.0 TIMER AND AQUASTAT INSTALLATION

Follow the installation steps in both the Timer and Aquastat installation instructions and refer to Fig. 5 for the wiring connections.

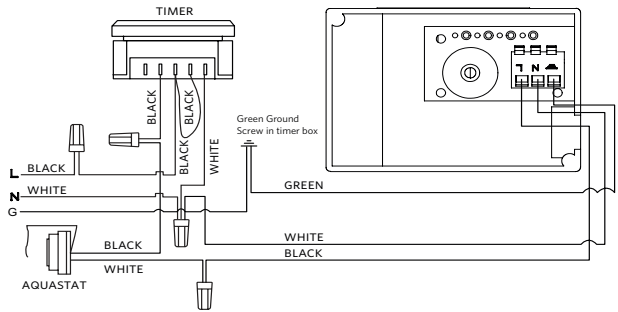


FIG. 5 Astro 2 Series circulator with 24-Hour Timer and Aquastat Control wiring diagram

9.0 TIMER PROGRAMMING WITH MANUAL
OVERRIDE SWITCH

Automatic Mode

In order to operate the time switch in the automatic mode, the manual switch must be in the center position. (See FIG. 6)

Manual Mode

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "o", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed. (See FIG. 6)

OVERRIDE MODE

3-WAY MANUAL
OVERRIDE SWITCH

I = PERMANENT ON
⊕ = AUTOMATIC
0 = PERMANENT OFF

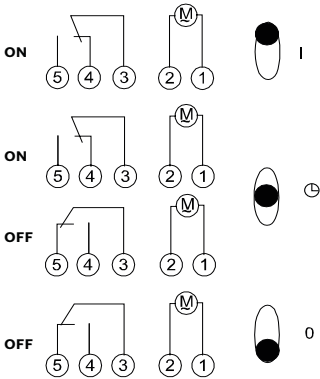


FIG. 6

INSTALLATION &
OPERATING INSTRUCTIONS

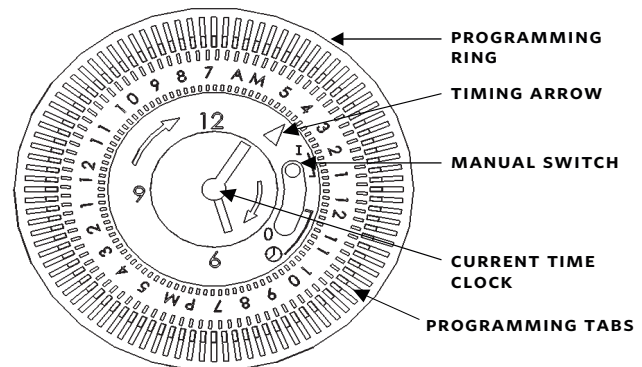
24-hour Timer and Aquastat
control accessory for Astro 2

4

TIMER PROGRAMMING

1. Set the current time by turning the programming ring clockwise until the timing arrow points to the current time of day.
2. Restore power to the circulator and set the manual switch on the timer dial to the "ON" position ("I").
3. Set the required "ON/OFF" times by pushing the programming tabs to the outer position for "ON" time intervals. For "OFF" ("O") operation keep the programming tabs in the inner position.
4. Set the manual switch to the center position, between the "I" and "O" on the timer dial in order to cycle the pump according to the programming tab settings. The pump will run continuously when the switch is set to "I" (ON) position. The "O" (OFF) position of the switch will shut the circulator off at all times.
5. In the event of power outage, the timer must be adjusted for the correct time of day after power is restored.

Note: The 24-hour timer requires manual resetting for daylight savings time.



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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

CP-2



ASTRO 2 | THREE SPEED CIRCULATORS | SUBMITTAL

File No: 10.584
Date: MARCH 03, 2017
Supersedes: 10.584
Date: APRIL 03, 2014

Job: _____ Representative: _____
 _____ Ordered by: _____ Date: _____
 Engineer: _____ Submitted by: _____ Date: _____
 Contractor: _____ Approved by: _____ Date: _____

TECHNICAL DATA

Certification: ETL listed for US and Canada (conforms to UL STD. 778 certified to CSA STD. C22.2 NO.108-01)
 NSF 372 (for lead free bronze and stainless steel models)
Flow range: 0 - 64 USgpm / 0 - 4.04 l/s
Head range: 0 - 42.0 feet / 0 - 12.8 meters
Maximum fluid temperature: 185°F / 85°C (Astro 286 up to 1.35A)
 150°F / 65°C (Astro 286 over 1.35A)
 230°F / 110°C† (all others)
Maximum working pressure: 150 psi / 1034 kPa

MATERIALS OF CONSTRUCTION

Pump body: Cast iron (closed systems)
 Lead free bronze* (open systems)
 Stainless steel* (open systems)
Impeller: Noryl
Shaft: Ceramic
Bearings: Ceramic
Gasket material: EPDM

DIMENSIONS AND WEIGHTS

LEAD FREE BRONZE*	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 225BS ½" SWT	5.00 (127)	5.00 (127)	4.13 (105)	—	3.10 (79)	—	Sweat - ½"	6.0 (2.7)
Astro 225BS ¾" SWT	5.00 (127)	5.00 (127)	4.13 (105)	—	3.10 (79)	—	Sweat - ¾"	6.0 (2.7)
STAINLESS STEEL*	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 220SSU**	6.00 (152)	5.00 (127)	4.00 (102)	—	3.10 (79)	—	Union - 1¼" NPSM	6.5 (2.9)
Astro 225SSU**	6.00 (152)	5.00 (127)	4.00 (102)	—	3.10 (79)	—	Union - 1¼" NPSM	6.5 (2.9)
Astro 230SS**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250SS**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 210SS**	6.50 (165)	7.25 (184)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 280SS (230V)**	6.50 (165)	6.75 (171)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 286SS**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 290SS**	8.50 (216)	6.65 (169)	5.20 (132)	4.00 (102)	3.60 (91)	3.45 (88)	Flange - (2) ½" dia. bolt holes	13.2 (6.0)
CAST IRON	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 230CI**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 230CI-R**	6.38 (162)	5.63 (137)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250CI**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250CI-R**	6.38 (162)	5.63 (137)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 210CI**	6.50 (165)	7.25 (184)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 280CI (230V)**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 286CI**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 290CI**	8.50 (216)	6.65 (169)	5.20 (132)	4.00 (102)	3.60 (91)	3.45 (88)	Flange - (2) ½" dia. bolt holes	13.2 (6.0)

NOTE: All dimensions are in inches (mm) and weights in lbs (kg).

* Certified <0.25 weighted average percent lead and complies with California Health and Safety Code Section 116875 (commonly known as AB 1953).

** Removable check valve installed at pump outlet.

† For open systems, it is recommended that the fluid temperature be less than 150°F (66°C) to avoid precipitation of calcium.

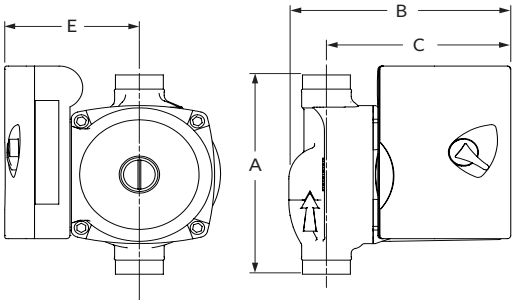
SUBMITTAL Astro 2
3-speed circulator models

2

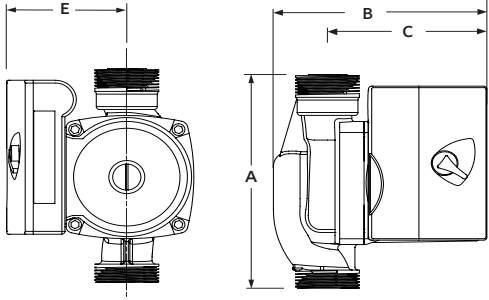
MOTOR DATA

MODEL	ELECTRICAL INPUT	SPEED	FULL LOAD AMP DRAW (A)	NOMINAL POWER (W)
ASTRO 210CI/SS	115V, 60HZ Single phase	3	1.06	200
		2	1.50	
		1	1.72	
ASTRO 220SSU		3	0.29	33
		2	0.27	
		1	0.20	
ASTRO 225BS		3	0.64	75
		2	0.49	
		1	0.38	
ASTRO 225SSU		3	0.69	83
		2	0.55	
		1	0.43	
ASTRO 230SS/CI/CI-R		3	0.81	97
		2	0.58	
		1	0.45	
ASTRO 250SS/CI/CI-R		3	0.98	117
		2	0.79	
		1	0.65	
ASTRO 280CI/SS		3	1.90	218
		2	1.80	
		1	1.50	
ASTRO 290CI/SS		3	1.90	218
		2	1.60	
		1	1.40	
ASTRO 280CI/SS 230V	230V, 60HZ Single phase	3	0.90	210
		2	0.86	
		1	0.80	
ASTRO 286CI/SS		1	1.60	370

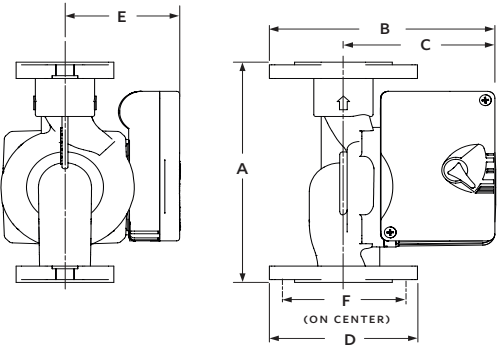
ASTRO 225BS



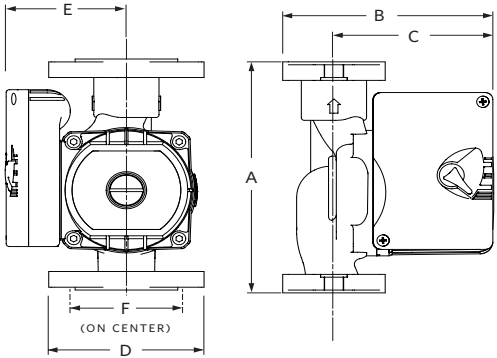
ASTRO 220SSU & 225SSU



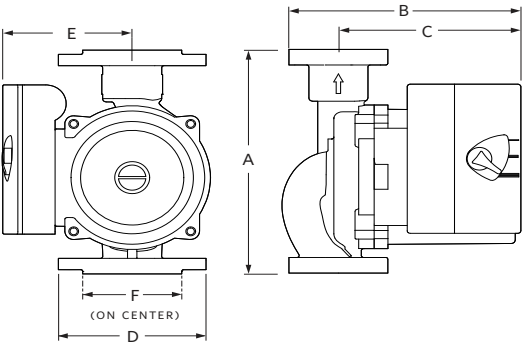
ASTRO 230SS/CI & 250SS/CI



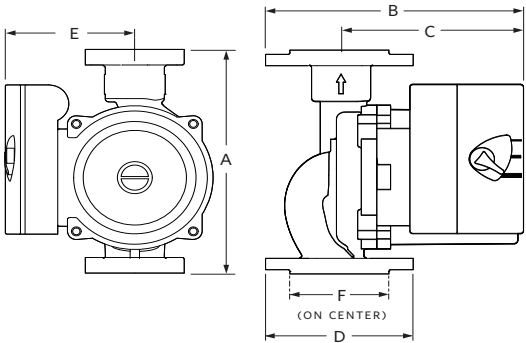
ASTRO 230CI-R & 250CI-R



ASTRO 280CI, 290CI/SS & 286CI/SS



ASTRO 210CI/SS & 280SS



HARDWARE KIT

Companion flange kit (contains two (2) flanges, hardware and gaskets)

Cast iron: 0.75", 1", 1.25", 1.5"

Bronze: 0.75", 1", 1.25", 1.5"

Union fitting (contains two (2) half unions and gaskets)

1.25" NPSM to:

Brass/Lead free bronze: 0.5" sweat, 0.75" sweat, 0.75" FNPT

CHECK VALVE SIZE

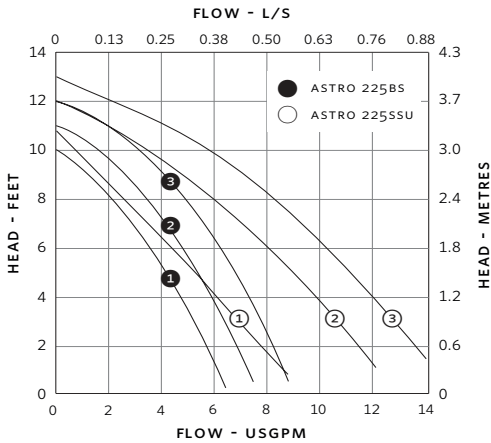
CHECK VALVE SIZE	MODEL
1" Diameter	ASTRO 220SSU, ASTRO 225SSU
1¼" Diameter	ASTRO 210, ASTRO 230, ASTRO 250, ASTRO 280, ASTRO 286
1½" Diameter	ASTRO 290

SUBMITTAL Astro 2
3-speed circulator models

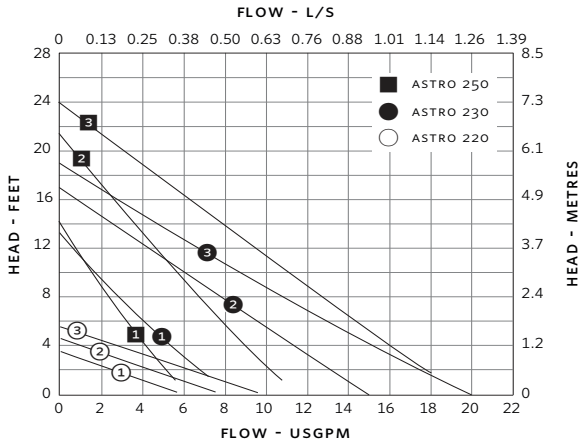
4

PERFORMANCE CURVES

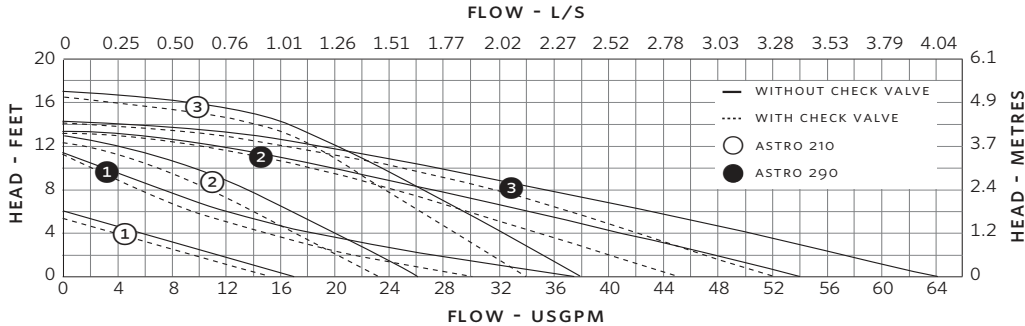
ASTRO 225BS, 225SSU



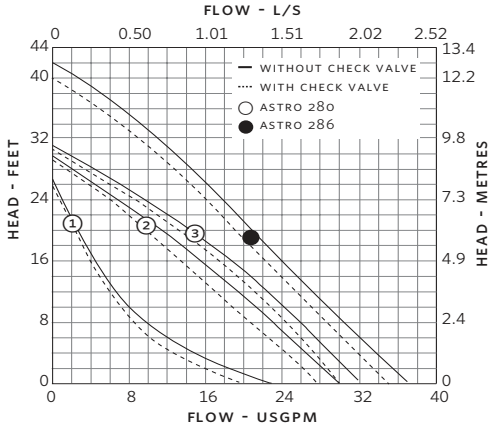
ASTRO 220, 230, 250



ASTRO 210, 290



ASTRO 280, 286



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ARMSTRONG FLUID TECHNOLOGY
ESTABLISHED 1934

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24-HOUR TIMER AND AQUASTAT CONTROL
ACCESSORY FOR ASTRO 2 | INSTALLATION AND
OPERATING INSTRUCTIONS

File No: 11.871
Date: FEBRUARY 24, 2017
Supersedes: 11.871
Date: JULY 16, 2015

1.0	Timer application	1	6.0	Aquastat control accessory	2
2.0	Installation	1	7.0	Aquastat installation	3
3.0	Timer and aquastat application	1	8.0	Timer and aquastat installation	3
4.0	24-Hour timer	2	9.0	Timer programming with manual override switch	3
5.0	Timer installation	2			

1.0 TIMER APPLICATION

The Armstrong 24-hour timers provide On/Off pump control according to preset operating times in order to increase comfort and improve the overall efficiency of domestic hot water re-circulation systems. The 24-hour timers are designed for use with Armstrong circulators installed in indoor hot water re-circulation applications.

Typical timer applications will cycle the pump at preset times, allowing the user to select operation of the circulating pump during high peak usage periods in order to decrease the delivery time to outlet fixtures and reduce wasted water.

The timer control is programmable to ¼ hour intervals within a 24-hour time frame utilizing a user friendly analog clock timer with hour and minute hands, two directional arrows, and AM/PM time setting.



3.0 TIMER AND AQUASTAT APPLICATION

The 24-hour timer and aquastat can also be used together giving a comprehensive time and temperature actuated pump control in a domestic hot water re-circulation system. Typical application of the timer and aquastat combination will circulate water only when both time and temperature ON conditions are initiated.

TIMER FEATURES

- Easy to install and program
- Time actuated 24-hour on/off pump control
- Hour and minute time setting with AM/PM function
- Manual override switch modes
- Rugged construction - steel enclosure
- Clear plastic cover for dust and moisture protection of the clock face
- Designed specifically for hot water re-circulation applications
- UL Listed



TIMER FEATURES

- Easy to install
- Temperature actuated pump control
- Environmentally sealed enclosure
- Surface sensing through snap acting bimetalic disc
- UL Listed

2.0 AQUASTAT APPLICATION

An optional aquastat is available for constant circulation applications to maintain temperature between 85°F and 105°F (29°C and 41°C). The Armstrong aquastat control accessory is designed for use with Astro Series wet rotor circulators in potable hot water re-circulation installations.

The aquastat control automatically turns the circulator on when the temperature in the hot water line falls below approximately 85°F (ON condition - for example when there is low demand on the hot water supply). The control turns it off again when the temperature exceeds 105°F (OFF condition - as in the case of periods with high demand).



4.0 24-HOUR TIMER

TECHNICAL DATA

Description	24-Hour Timer
Application	Time actuated On/Off pump control
Shortest Switching Interval	¼ hour (15 minutes)
Manual Switch Modes	"Timer", "ON" Override, "OFF" Override

INSTALLATION & OPERATING INSTRUCTIONS

24-hour Timer and Aquastat control accessory for Astro 2

2

TECHNICAL DATA	
Ambient Temperature Range	-40°F to 180°F (-40°C to 82°C)
Power Consumption	120 V, 0.5 W
Supply Voltage	110-120 VAC, 60 Hz
Terminals	¼" spade terminals
Weight	Approximately 3 oz.

5.0 TIMER INSTALLATION

WARNING



Electrical shock hazard - Verify that the electrical rating of the device matches the values shown on the nameplate of the circulator. All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electric Code, local codes and regulations. Failure to follow these instructions could result in serious injury, death and/ or property damage.

WARNING



Risk of electric shock - This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Note: Steps 1 & 3 apply to retrofit installations.

- 1 Disconnect the electrical supply to the circulator
Note: Numerical component designations included in Steps 2 through 8 refer to circulator and timer components shown in **FIG. 1**.
- 2 Unfasten the mounting 2 screws (4) and remove the terminal box cover (3).
- 3 Disconnect wire leads from the power supply.
- 4 Connect power supply wires (black, white and green) to the timer unit and to the circulator terminals (as shown in **FIG. 2**).
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 5 Place the timer box cover (5) using the 2 mounting screws (4). Insure that all lead wires are inside the timer assembly.
- 6 Program the timer according to instructions provided on page 6.
- 7 Connect the unit to electrical supply.
- 8 Start the circulator.

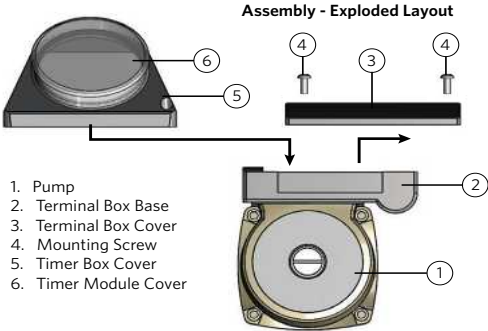


FIG. 1 Astro 2 Series circulator and 24-Hour Timer assembly drawing

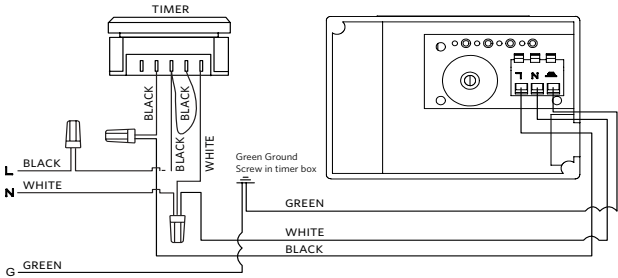


FIG. 2 Astro 2 Series circulator and 24-Hour Timer wiring diagram

6.0 AQUASTAT CONTROL ACCESSORY

TECHNICAL DATA	
Description	Aquastat (thermostatic) switch
Type	Surface sensing, snap acting bimetallic disc
Enclosure	Environmentally sealed
Switch modes*	105 ± 5°F (40 ± 2°C) pump switches OFF 85 ± 6°F (29 ± 3°C) pump switches ON
Contact position	Normally open
Mounting	½": Clip-on type for ⅝" o.d. system piping size (i.e., ½" I.D. copper tubing or ⅜" steel pipe) ¾": Clip-on type for ⅞" o.d. system piping size (i.e., ¾" I.D. copper tubing or ½" steel pipe) May be mounted on either the inlet or outlet piping of the circulator.
Lead length	14" (356 mm)

*Temperatures indicated are at pipe surface

7.0 AQUASTAT INSTALLATION

- 1 Follow Steps 1, 2 and 3 in the Timer Installation section
- 2 The aquastat control is a surface temperature sensing device that must be in contact with the system piping to operate properly. Separate models include clip-on mounts for 3/4" (7/8" o.d.) and 1/2" (5/8" o.d.) copper tubing. (See FIG. 3)
- 3 Connect the black, green and white lead wires according to the wiring diagram (FIG. 4)
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 4 Close the terminal box cover and fasten the screw

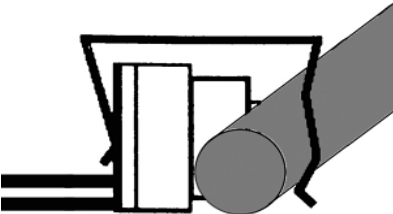


FIG. 3

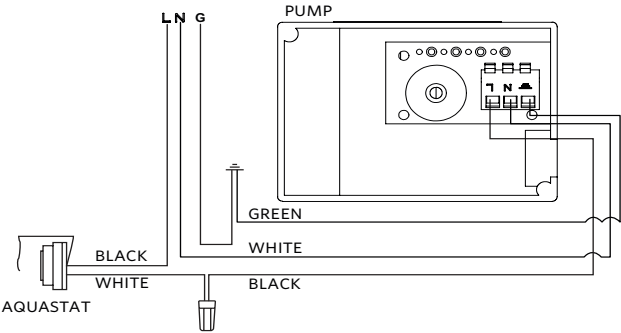


FIG. 4 Astro 2 Series circulator with Aquastat Control wiring diagram

8.0 TIMER AND AQUASTAT INSTALLATION

Follow the installation steps in both the Timer and Aquastat installation instructions and refer to Fig. 5 for the wiring connections.

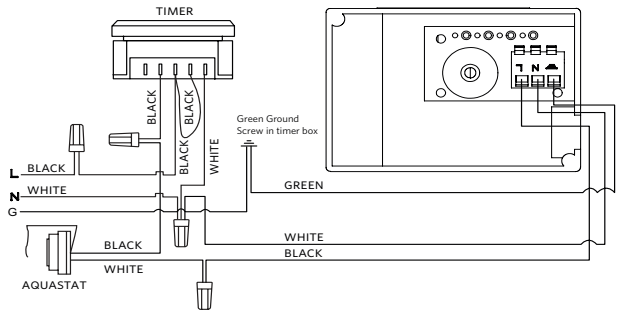


FIG. 5 Astro 2 Series circulator with 24-Hour Timer and Aquastat Control wiring diagram

9.0 TIMER PROGRAMMING WITH MANUAL
OVERRIDE SWITCH

Automatic Mode

In order to operate the time switch in the automatic mode, the manual switch must be in the center position. (See FIG. 6)

Manual Mode

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "o", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed. (See FIG. 6)

OVERRIDE MODE

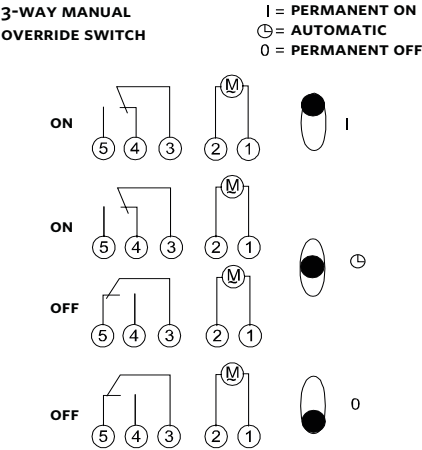


FIG. 6

INSTALLATION &
OPERATING INSTRUCTIONS

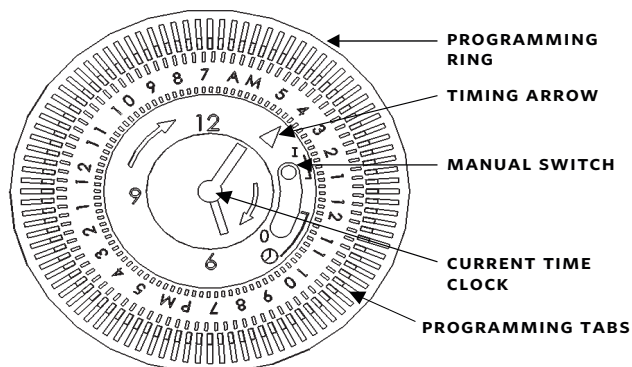
24-hour Timer and Aquastat
control accessory for Astro 2

4

TIMER PROGRAMMING

1. Set the current time by turning the programming ring clockwise until the timing arrow points to the current time of day.
2. Restore power to the circulator and set the manual switch on the timer dial to the "ON" position ("I").
3. Set the required "ON/OFF" times by pushing the programming tabs to the outer position for "ON" time intervals. For "OFF" ("O") operation keep the programming tabs in the inner position.
4. Set the manual switch to the center position, between the "I" and "O" on the timer dial in order to cycle the pump according to the programming tab settings. The pump will run continuously when the switch is set to "I" (ON) position. The "O" (OFF) position of the switch will shut the circulator off at all times.
5. In the event of power outage, the timer must be adjusted for the correct time of day after power is restored.

Note: The 24-hour timer requires manual resetting for daylight savings time.



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ARMSTRONG FLUID TECHNOLOGY
ESTABLISHED 1934

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24-HOUR TIMER AND AQUASTAT CONTROL ACCESSORY FOR ASTRO 2 | INSTALLATION AND OPERATING INSTRUCTIONS

File No: 11.871
Date: FEBRUARY 24, 2017
Supersedes: 11.871
Date: JULY 16, 2015

1.0	Timer application	1	6.0	Aquastat control accessory	2
2.0	Installation	1	7.0	Aquastat installation	3
3.0	Timer and aquastat application	1	8.0	Timer and aquastat installation	3
4.0	24-Hour timer	2	9.0	Timer programming with manual override switch	3
5.0	Timer installation	2			

1.0 TIMER APPLICATION

The Armstrong 24-hour timers provide On/Off pump control according to preset operating times in order to increase comfort and improve the overall efficiency of domestic hot water re-circulation systems. The 24-hour timers are designed for use with Armstrong circulators installed in indoor hot water re-circulation applications.

Typical timer applications will cycle the pump at preset times, allowing the user to select operation of the circulating pump during high peak usage periods in order to decrease the delivery time to outlet fixtures and reduce wasted water.

The timer control is programmable to ¼ hour intervals within a 24-hour time frame utilizing a user friendly analog clock timer with hour and minute hands, two directional arrows, and AM/PM time setting.



3.0 TIMER AND AQUASTAT APPLICATION

The 24-hour timer and aquastat can also be used together giving a comprehensive time and temperature actuated pump control in a domestic hot water re-circulation system. Typical application of the timer and aquastat combination will circulate water only when both time and temperature on conditions are initiated.

- 
- TIMER FEATURES**
- Easy to install and program
 - Time actuated 24-hour on/off pump control
 - Hour and minute time setting with AM/PM function
 - Manual override switch modes
 - Rugged construction - steel enclosure
 - Clear plastic cover for dust and moisture protection of the clock face
 - Designed specifically for hot water re-circulation applications
 - UL Listed

2.0 AQUASTAT APPLICATION

An optional aquastat is available for constant circulation applications to maintain temperature between 85°F and 105°F (29°C and 41°C). The Armstrong aquastat control accessory is designed for use with Astro Series wet rotor circulators in potable hot water re-circulation installations.

The aquastat control automatically turns the circulator on when the temperature in the hot water line falls below approximately 85°F (on condition - for example when there is low demand on the hot water supply). The control turns it off again when the temperature exceeds 105°F (off condition - as in the case of periods with high demand).



- TIMER FEATURES**
- Easy to install
 - Temperature actuated pump control
 - Environmentally sealed enclosure
 - Surface sensing through snap acting bimetalic disc
 - UL Listed

4.0 24-HOUR TIMER

TECHNICAL DATA	
Description	24-Hour Timer
Application	Time actuated On/Off pump control
Shortest Switching Interval	¼ hour (15 minutes)
Manual Switch Modes	"Timer", "ON" Override, "OFF" Override

INSTALLATION &
OPERATING INSTRUCTIONS

24-hour Timer and Aquastat
control accessory for Astro 2

2

TECHNICAL DATA	
Ambient Temperature Range	-40°F to 180°F (-40°C to 82°C)
Power Consumption	120 V, 0.5 W
Supply Voltage	110-120 VAC, 60 Hz
Terminals	¼" spade terminals
Weight	Approximately 3 oz.

5.0 TIMER INSTALLATION

WARNING



Electrical shock hazard - Verify that the electrical rating of the device matches the values shown on the nameplate of the circulator. All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electric Code, local codes and regulations. Failure to follow these instructions could result in serious injury, death and/ or property damage.

WARNING



Risk of electric shock – This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Note: Steps 1 & 3 apply to retrofit installations.

- 1 Disconnect the electrical supply to the circulator
Note: Numerical component designations included in Steps 2 through 8 refer to circulator and timer components shown in **FIG. 1**.
- 2 Unfasten the mounting 2 screws (4) and remove the terminal box cover (3).
- 3 Disconnect wire leads from the power supply.
- 4 Connect power supply wires (black, white and green) to the timer unit and to the circulator terminals (as shown in **FIG. 2**).
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 5 Place the timer box cover (5) using the 2 mounting screws (4). Insure that all lead wires are inside the timer assembly.
- 6 Program the timer according to instructions provided on page 6.
- 7 Connect the unit to electrical supply.
- 8 Start the circulator.

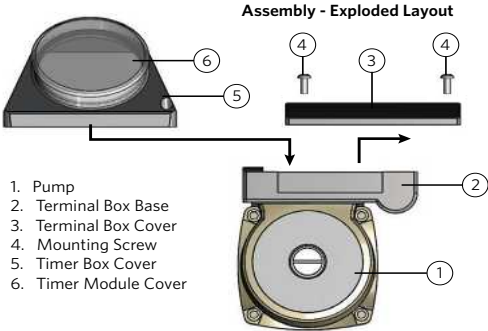


FIG. 1 Astro 2 Series circulator and 24-Hour Timer assembly drawing

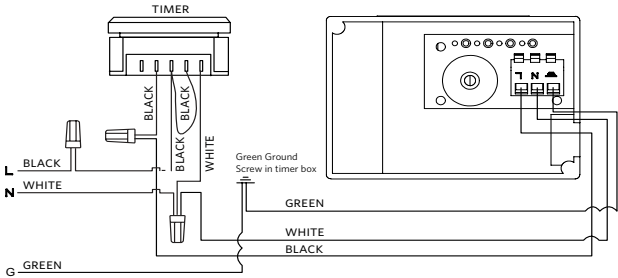


FIG. 2 Astro 2 Series circulator and 24-Hour Timer wiring diagram

6.0 AQUASTAT CONTROL ACCESSORY

TECHNICAL DATA	
Description	Aquastat (thermostatic) switch
Type	Surface sensing, snap acting bimetallic disc
Enclosure	Environmentally sealed
Switch modes*	105 ± 5°F (40 ± 2°C) pump switches OFF 85 ± 6°F (29 ± 3°C) pump switches ON
Contact position	Normally open
Mounting	½": Clip-on type for ⅝" o.d. system piping size (i.e., ½" I.D. copper tubing or ¾" steel pipe) ¾": Clip-on type for ⅞" o.d. system piping size (i.e., ¾" I.D. copper tubing or ½" steel pipe) May be mounted on either the inlet or outlet piping of the circulator.
Lead length	14" (356 mm)

*Temperatures indicated are at pipe surface

7.0 AQUASTAT INSTALLATION

- 1 Follow Steps 1, 2 and 3 in the Timer Installation section
- 2 The aquastat control is a surface temperature sensing device that must be in contact with the system piping to operate properly. Separate models include clip-on mounts for 3/4" (7/8" o.d.) and 1/2" (5/8" o.d.) copper tubing. (See FIG. 3)
- 3 Connect the black, green and white lead wires according to the wiring diagram (FIG. 4)
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 4 Close the terminal box cover and fasten the screw

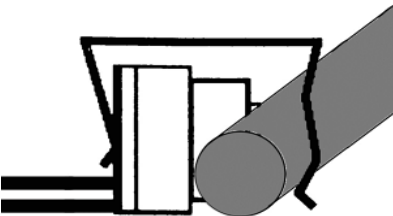


FIG. 3

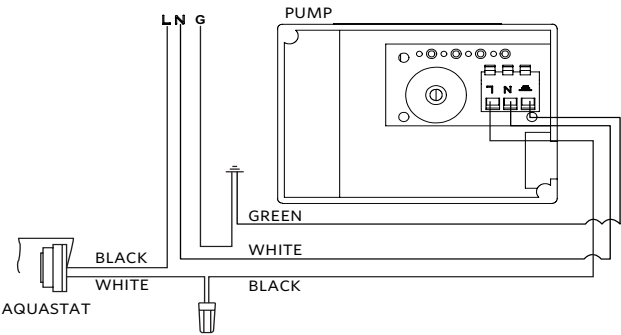


FIG. 4 Astro 2 Series circulator with Aquastat Control wiring diagram

8.0 TIMER AND AQUASTAT INSTALLATION

Follow the installation steps in both the Timer and Aquastat installation instructions and refer to Fig. 5 for the wiring connections.

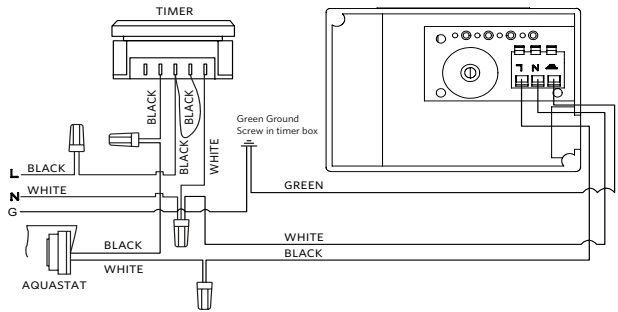


FIG. 5 Astro 2 Series circulator with 24-Hour Timer and Aquastat Control wiring diagram

9.0 TIMER PROGRAMMING WITH MANUAL
OVERRIDE SWITCH

Automatic Mode

In order to operate the time switch in the automatic mode, the manual switch must be in the center position. (See FIG. 6)

Manual Mode

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "o", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed. (See FIG. 6)

OVERRIDE MODE

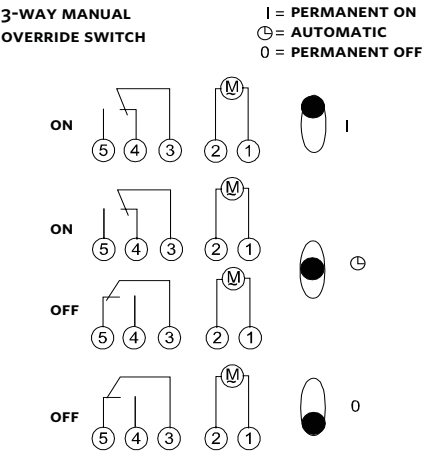


FIG. 6

INSTALLATION &
OPERATING INSTRUCTIONS

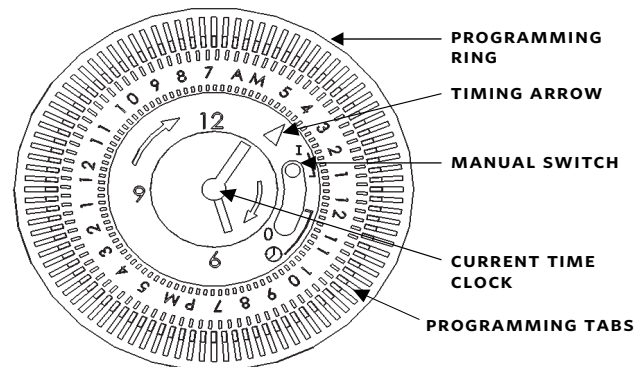
24-hour Timer and Aquastat
control accessory for Astro 2

4

TIMER PROGRAMMING

1. Set the current time by turning the programming ring clockwise until the timing arrow points to the current time of day.
2. Restore power to the circulator and set the manual switch on the timer dial to the "ON" position ("I").
3. Set the required "ON/OFF" times by pushing the programming tabs to the outer position for "ON" time intervals. For "OFF" ("O") operation keep the programming tabs in the inner position.
4. Set the manual switch to the center position, between the "I" and "O" on the timer dial in order to cycle the pump according to the programming tab settings. The pump will run continuously when the switch is set to "I" (ON) position. The "O" (OFF) position of the switch will shut the circulator off at all times.
5. In the event of power outage, the timer must be adjusted for the correct time of day after power is restored.

Note: The 24-hour timer requires manual resetting for daylight savings time.



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ESTABLISHED 1934

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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

CP-3



ASTRO 2 | THREE SPEED CIRCULATORS | SUBMITTAL

File No: 10.584
Date: MARCH 03, 2017
Supersedes: 10.584
Date: APRIL 03, 2014

Job: _____ Representative: _____
 _____ Ordered by: _____ Date: _____
 Engineer: _____ Submitted by: _____ Date: _____
 Contractor: _____ Approved by: _____ Date: _____

TECHNICAL DATA

Certification: ETL listed for US and Canada (conforms to UL STD. 778 certified to CSA STD. C22.2 NO.108-01)
 NSF 372 (for lead free bronze and stainless steel models)

Flow range: 0 - 64 USgpm / 0 - 4.04 l/s

Head range: 0 - 42.0 feet / 0 - 12.8 meters

Maximum fluid temperature: 185°F / 85°C (Astro 286 up to 1.35A)
 150°F / 65°C (Astro 286 over 1.35A)
 230°F / 110°C† (all others)

Maximum working pressure: 150 psi / 1034 kPa

MATERIALS OF CONSTRUCTION

Pump body: Cast iron (closed systems)
 Lead free bronze* (open systems)
 Stainless steel* (open systems)

Impeller: Noryl

Shaft: Ceramic

Bearings: Ceramic

Gasket material: EPDM

DIMENSIONS AND WEIGHTS

LEAD FREE BRONZE*	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 225BS ½" SWT	5.00 (127)	5.00 (127)	4.13 (105)	—	3.10 (79)	—	Sweat - ½"	6.0 (2.7)
Astro 225BS ¾" SWT	5.00 (127)	5.00 (127)	4.13 (105)	—	3.10 (79)	—	Sweat - ¾"	6.0 (2.7)
STAINLESS STEEL*	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 220SSU**	6.00 (152)	5.00 (127)	4.00 (102)	—	3.10 (79)	—	Union - 1¼" NPSM	6.5 (2.9)
Astro 225SSU**	6.00 (152)	5.00 (127)	4.00 (102)	—	3.10 (79)	—	Union - 1¼" NPSM	6.5 (2.9)
Astro 230SS**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250SS**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 210SS**	6.50 (165)	7.25 (184)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 280SS (230V)**	6.50 (165)	6.75 (171)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 286SS**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 290SS**	8.50 (216)	6.65 (169)	5.20 (132)	4.00 (102)	3.60 (91)	3.45 (88)	Flange - (2) ½" dia. bolt holes	13.2 (6.0)
CAST IRON	A	B	C	D	E	F	CONNECTION TYPE & SIZE	WEIGHT
Astro 230CI**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 230CI-R**	6.38 (162)	5.63 (137)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250CI**	6.38 (162)	6.00 (150)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 250CI-R**	6.38 (162)	5.63 (137)	4.00 (102)	4.00 (102)	3.10 (79)	3.25 (80)	Flange - (2) ½" dia. bolt holes	8.0 (3.6)
Astro 210CI**	6.50 (165)	7.25 (184)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 280CI (230V)**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 286CI**	6.50 (165)	6.38 (162)	4.87 (124)	4.00 (102)	3.60 (91)	3.13 (80)	Flange - (2) ½" dia. bolt holes	10.1 (4.6)
Astro 290CI**	8.50 (216)	6.65 (169)	5.20 (132)	4.00 (102)	3.60 (91)	3.45 (88)	Flange - (2) ½" dia. bolt holes	13.2 (6.0)

NOTE: All dimensions are in inches (mm) and weights in lbs (kg).

* Certified <0.25 weighted average percent lead and complies with California Health and Safety Code Section 116875 (commonly known as AB 1953).

** Removable check valve installed at pump outlet.

† For open systems, it is recommended that the fluid temperature be less than 150°F (66°C) to avoid precipitation of calcium.

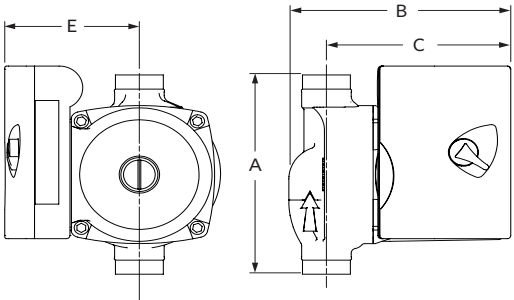
SUBMITTAL Astro 2
3-speed circulator models

2

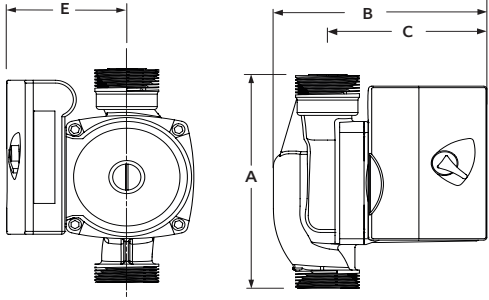
MOTOR DATA

MODEL	ELECTRICAL INPUT	SPEED	FULL LOAD AMP DRAW (A)	NOMINAL POWER (W)
ASTRO 210CI/SS		3	1.06	200
		2	1.50	
		1	1.72	
ASTRO 220SSU		3	0.29	33
		2	0.27	
		1	0.20	
ASTRO 225BS		3	0.64	75
		2	0.49	
		1	0.38	
ASTRO 225SSU		3	0.69	83
		2	0.55	
		1	0.43	
ASTRO 230SS/CI/CI-R	115V, 60HZ Single phase	3	0.81	97
		2	0.58	
		1	0.45	
ASTRO 250SS/CI/CI-R		3	0.98	117
		2	0.79	
		1	0.65	
ASTRO 280CI/SS		3	1.90	218
		2	1.80	
		1	1.50	
ASTRO 290CI/SS		3	1.90	218
		2	1.60	
		1	1.40	
ASTRO 280CI/SS 230V	230V, 60HZ Single phase	3	0.90	210
		2	0.86	
		1	0.80	
ASTRO 286CI/SS		1	1.60	370

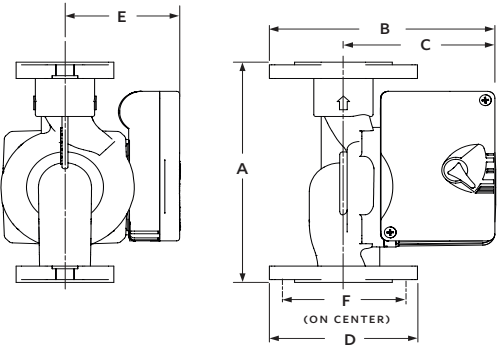
ASTRO 225BS



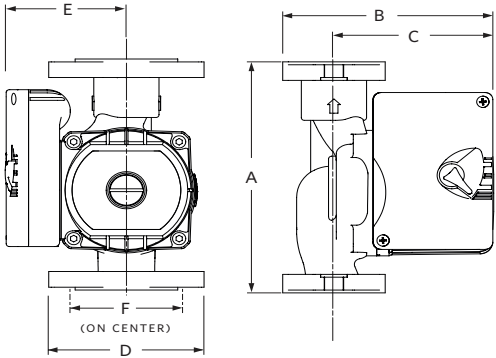
ASTRO 220SSU & 225SSU



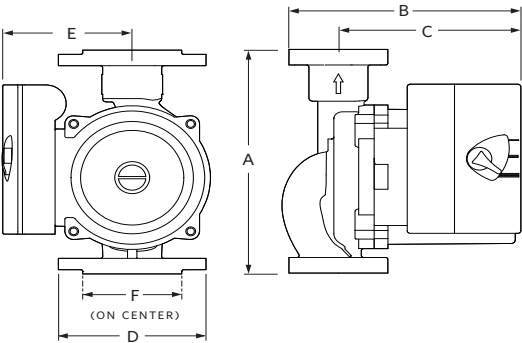
ASTRO 230SS/CI & 250SS/CI



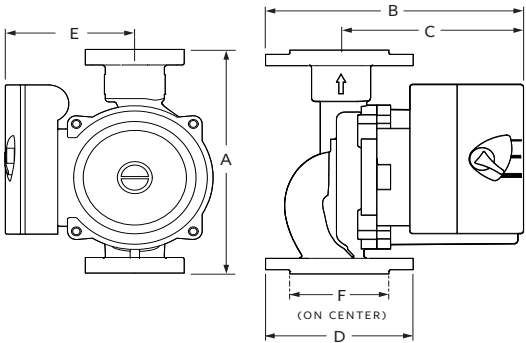
ASTRO 230CI-R & 250CI-R



ASTRO 280CI, 290CI/SS & 286CI/SS



ASTRO 210CI/SS & 280SS



HARDWARE KIT

Companion flange kit (contains two (2) flanges, hardware and gaskets)

Cast iron: 0.75", 1", 1.25", 1.5"

Bronze: 0.75", 1", 1.25", 1.5"

Union fitting (contains two (2) half unions and gaskets)

1.25" NPSM to:

Brass/Lead free bronze: 0.5" sweat, 0.75" sweat, 0.75" FNPT

CHECK VALVE SIZE

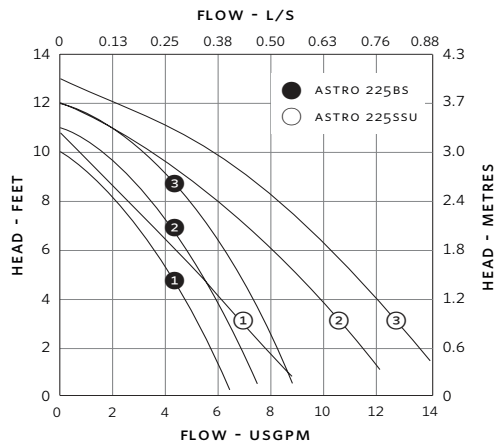
CHECK VALVE SIZE	MODEL
1" Diameter	ASTRO 220SSU, ASTRO 225SSU
1¼" Diameter	ASTRO 210, ASTRO 230, ASTRO 250, ASTRO 280, ASTRO 286
1½" Diameter	ASTRO 290

SUBMITTAL Astro 2
3-speed circulator models

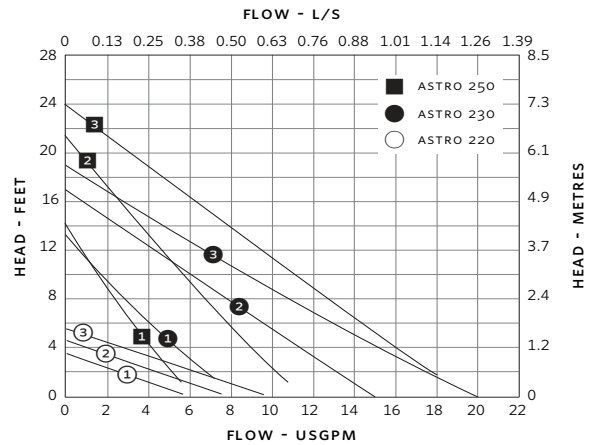
4

PERFORMANCE CURVES

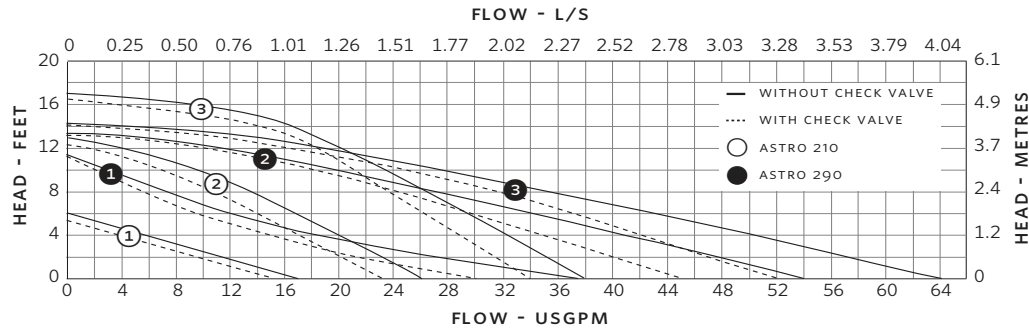
ASTRO 225BS, 225SSU



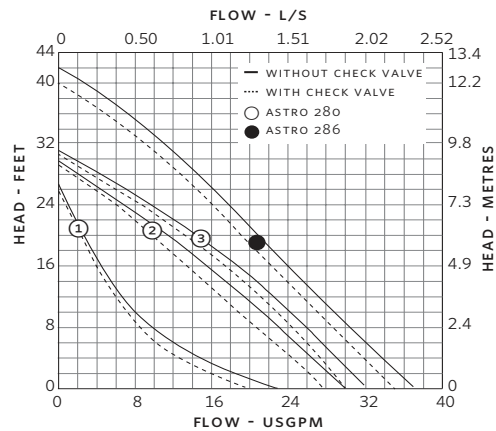
ASTRO 220, 230, 250



ASTRO 210, 290



ASTRO 280, 286



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24-HOUR TIMER AND AQUASTAT CONTROL ACCESSORY FOR ASTRO 2 | INSTALLATION AND OPERATING INSTRUCTIONS

File No: 11.871
Date: FEBRUARY 24, 2017
Supersedes: 11.871
Date: JULY 16, 2015

1.0	Timer application	1	6.0	Aquastat control accessory	2
2.0	Installation	1	7.0	Aquastat installation	3
3.0	Timer and aquastat application	1	8.0	Timer and aquastat installation	3
4.0	24-Hour timer	2	9.0	Timer programming with manual override switch	3
5.0	Timer installation	2			

1.0 TIMER APPLICATION

The Armstrong 24-hour timers provide On/Off pump control according to preset operating times in order to increase comfort and improve the overall efficiency of domestic hot water re-circulation systems. The 24-hour timers are designed for use with Armstrong circulators installed in indoor hot water re-circulation applications.

Typical timer applications will cycle the pump at preset times, allowing the user to select operation of the circulating pump during high peak usage periods in order to decrease the delivery time to outlet fixtures and reduce wasted water.

The timer control is programmable to ¼ hour intervals within a 24-hour time frame utilizing a user friendly analog clock timer with hour and minute hands, two directional arrows, and AM/PM time setting.



3.0 TIMER AND AQUASTAT APPLICATION

The 24-hour timer and aquastat can also be used together giving a comprehensive time and temperature actuated pump control in a domestic hot water re-circulation system. Typical application of the timer and aquastat combination will circulate water only when both time and temperature ON conditions are initiated.

TIMER FEATURES

- Easy to install and program
- Time actuated 24-hour on/off pump control
- Hour and minute time setting with AM/PM function
- Manual override switch modes
- Rugged construction - steel enclosure
- Clear plastic cover for dust and moisture protection of the clock face
- Designed specifically for hot water re-circulation applications
- UL Listed



TIMER FEATURES

- Easy to install
- Temperature actuated pump control
- Environmentally sealed enclosure
- Surface sensing through snap acting bimetalic disc
- UL Listed

2.0 AQUASTAT APPLICATION

An optional aquastat is available for constant circulation applications to maintain temperature between 85°F and 105°F (29°C and 41°C). The Armstrong aquastat control accessory is designed for use with Astro Series wet rotor circulators in potable hot water re-circulation installations.

The aquastat control automatically turns the circulator on when the temperature in the hot water line falls below approximately 85°F (ON condition - for example when there is low demand on the hot water supply). The control turns it off again when the temperature exceeds 105°F (OFF condition - as in the case of periods with high demand).



4.0 24-HOUR TIMER

TECHNICAL DATA

Description	24-Hour Timer
Application	Time actuated On/Off pump control
Shortest Switching Interval	¼ hour (15 minutes)
Manual Switch Modes	"Timer", "ON" Override, "OFF" Override

INSTALLATION & OPERATING INSTRUCTIONS

24-hour Timer and Aquastat control accessory for Astro 2

2

TECHNICAL DATA	
Ambient Temperature Range	-40°F to 180°F (-40°C to 82°C)
Power Consumption	120 V, 0.5 W
Supply Voltage	110-120 VAC, 60 Hz
Terminals	¼" spade terminals
Weight	Approximately 3 oz.

5.0 TIMER INSTALLATION

WARNING

 Electrical shock hazard - Verify that the electrical rating of the device matches the values shown on the nameplate of the circulator. All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electric Code, local codes and regulations. Failure to follow these instructions could result in serious injury, death and/ or property damage.

WARNING

 **Risk of electric shock** – This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Note: Steps 1 & 3 apply to retrofit installations.

- 1 Disconnect the electrical supply to the circulator
Note: Numerical component designations included in Steps 2 through 8 refer to circulator and timer components shown in **FIG. 1**.
- 2 Unfasten the mounting 2 screws (4) and remove the terminal box cover (3).
- 3 Disconnect wire leads from the power supply.
- 4 Connect power supply wires (black, white and green) to the timer unit and to the circulator terminals (as shown in **FIG. 2**).
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 5 Place the timer box cover (5) using the 2 mounting screws (4). Insure that all lead wires are inside the timer assembly.
- 6 Program the timer according to instructions provided on page 6.
- 7 Connect the unit to electrical supply.
- 8 Start the circulator.

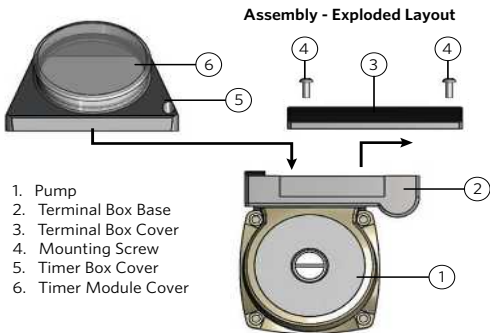


FIG. 1 Astro 2 Series circulator and 24-Hour Timer assembly drawing

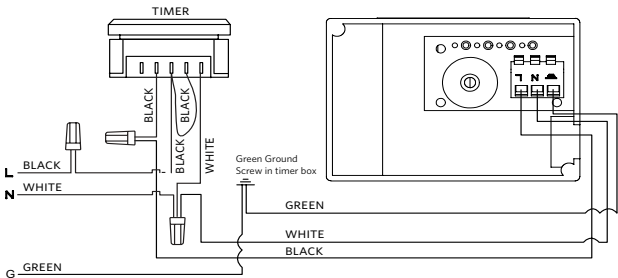


FIG. 2 Astro 2 Series circulator and 24-Hour Timer wiring diagram

6.0 AQUASTAT CONTROL ACCESSORY

TECHNICAL DATA	
Description	Aquastat (thermostatic) switch
Type	Surface sensing, snap acting bimetallic disc
Enclosure	Environmentally sealed
Switch modes*	105 ± 5°F (40 ± 2°C) pump switches OFF 85 ± 6°F (29 ± 3°C) pump switches ON
Contact position	Normally open
Mounting	½": Clip-on type for ⅝" o.d. system piping size (i.e., ½" I.D. copper tubing or ⅜" steel pipe) ¾": Clip-on type for ⅞" o.d. system piping size (i.e., ¾" I.D. copper tubing or ½" steel pipe) May be mounted on either the inlet or outlet piping of the circulator.
Lead length	14" (356 mm)

*Temperatures indicated are at pipe surface

7.0 AQUASTAT INSTALLATION

- 1 Follow Steps 1, 2 and 3 in the Timer Installation section
- 2 The aquastat control is a surface temperature sensing device that must be in contact with the system piping to operate properly. Separate models include clip-on mounts for 3/4" (7/8" o.d.) and 1/2" (5/8" o.d.) copper tubing. (See FIG. 3)
- 3 Connect the black, green and white lead wires according to the wiring diagram (FIG. 4)
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 4 Close the terminal box cover and fasten the screw

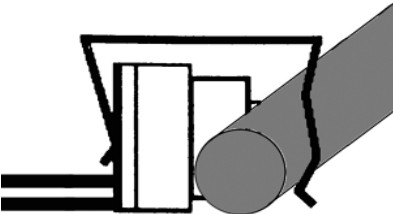


FIG. 3

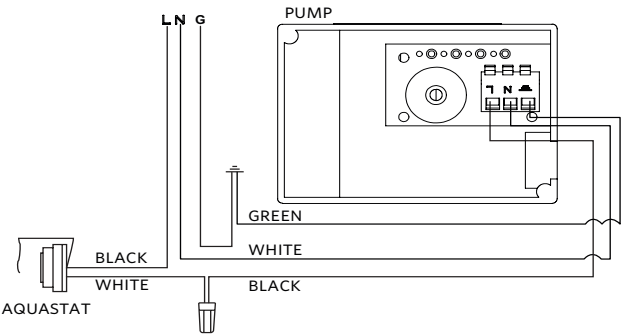


FIG. 4 Astro 2 Series circulator with Aquastat Control wiring diagram

8.0 TIMER AND AQUASTAT INSTALLATION

Follow the installation steps in both the Timer and Aquastat installation instructions and refer to Fig. 5 for the wiring connections.

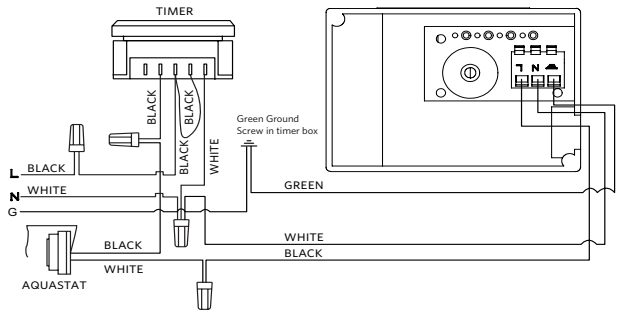


FIG. 5 Astro 2 Series circulator with 24-Hour Timer and Aquastat Control wiring diagram

9.0 TIMER PROGRAMMING WITH MANUAL
OVERRIDE SWITCH

Automatic Mode

In order to operate the time switch in the automatic mode, the manual switch must be in the center position. (See FIG. 6)

Manual Mode

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "o", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed. (See FIG. 6)

OVERRIDE MODE

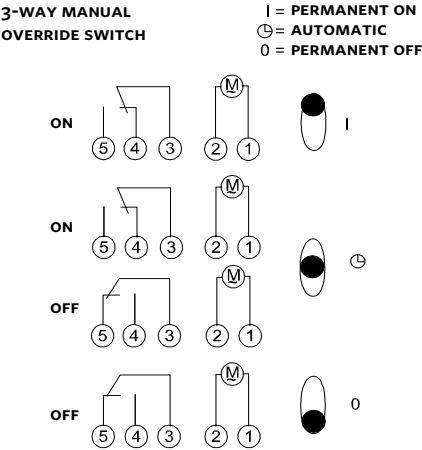


FIG. 6

INSTALLATION &
OPERATING INSTRUCTIONS

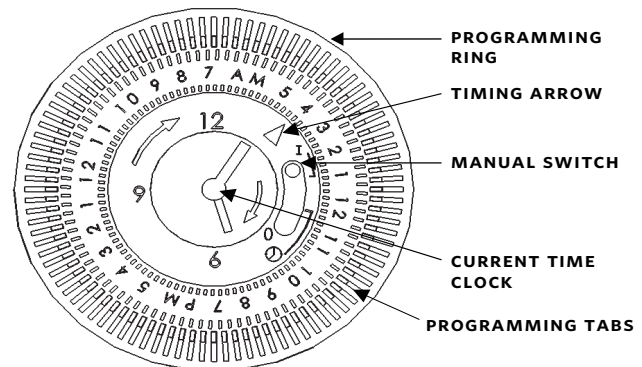
24-hour Timer and Aquastat
control accessory for Astro 2

4

TIMER PROGRAMMING

1. Set the current time by turning the programming ring clockwise until the timing arrow points to the current time of day.
2. Restore power to the circulator and set the manual switch on the timer dial to the "ON" position ("I").
3. Set the required "ON/OFF" times by pushing the programming tabs to the outer position for "ON" time intervals. For "OFF" ("O") operation keep the programming tabs in the inner position.
4. Set the manual switch to the center position, between the "I" and "O" on the timer dial in order to cycle the pump according to the programming tab settings. The pump will run continuously when the switch is set to "I" (ON) position. The "O" (OFF) position of the switch will shut the circulator off at all times.
5. In the event of power outage, the timer must be adjusted for the correct time of day after power is restored.

Note: The 24-hour timer requires manual resetting for daylight savings time.



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24-HOUR TIMER AND AQUASTAT CONTROL ACCESSORY FOR ASTRO 2 | INSTALLATION AND OPERATING INSTRUCTIONS

File No: 11.871
Date: FEBRUARY 24, 2017
Supersedes: 11.871
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1.0 TIMER APPLICATION

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Typical timer applications will cycle the pump at preset times, allowing the user to select operation of the circulating pump during high peak usage periods in order to decrease the delivery time to outlet fixtures and reduce wasted water.

The timer control is programmable to ¼ hour intervals within a 24-hour time frame utilizing a user friendly analog clock timer with hour and minute hands, two directional arrows, and AM/PM time setting.



3.0 TIMER AND AQUASTAT APPLICATION

The 24-hour timer and aquastat can also be used together giving a comprehensive time and temperature actuated pump control in a domestic hot water re-circulation system. Typical application of the timer and aquastat combination will circulate water only when both time and temperature on conditions are initiated.

- TIMER FEATURES**
- Easy to install and program
 - Time actuated 24-hour on/off pump control
 - Hour and minute time setting with AM/PM function
 - Manual override switch modes
 - Rugged construction - steel enclosure
 - Clear plastic cover for dust and moisture protection of the clock face
 - Designed specifically for hot water re-circulation applications
 - UL Listed



2.0 AQUASTAT APPLICATION

An optional aquastat is available for constant circulation applications to maintain temperature between 85°F and 105°F (29°C and 41°C). The Armstrong aquastat control accessory is designed for use with Astro Series wet rotor circulators in potable hot water re-circulation installations.

The aquastat control automatically turns the circulator on when the temperature in the hot water line falls below approximately 85°F (ON condition - for example when there is low demand on the hot water supply). The control turns it off again when the temperature exceeds 105°F (OFF condition - as in the case of periods with high demand).



- TIMER FEATURES**
- Easy to install
 - Temperature actuated pump control
 - Environmentally sealed enclosure
 - Surface sensing through snap acting bimetalic disc
 - UL Listed

4.0 24-HOUR TIMER

TECHNICAL DATA	
Description	24-Hour Timer
Application	Time actuated On/Off pump control
Shortest Switching Interval	¼ hour (15 minutes)
Manual Switch Modes	"Timer", "ON" Override, "OFF" Override

INSTALLATION & OPERATING INSTRUCTIONS

24-hour Timer and Aquastat control accessory for Astro 2

2

TECHNICAL DATA	
Ambient Temperature Range	-40°F to 180°F (-40°C to 82°C)
Power Consumption	120 V, 0.5 W
Supply Voltage	110-120 VAC, 60 Hz
Terminals	¼" spade terminals
Weight	Approximately 3 oz.

5.0 TIMER INSTALLATION

WARNING

 Electrical shock hazard - Verify that the electrical rating of the device matches the values shown on the nameplate of the circulator. All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electric Code, local codes and regulations. Failure to follow these instructions could result in serious injury, death and/ or property damage.

WARNING

 **Risk of electric shock** – This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Note: Steps 1 & 3 apply to retrofit installations.

- 1 Disconnect the electrical supply to the circulator
- Note:** Numerical component designations included in Steps 2 through 8 refer to circulator and timer components shown in **FIG. 1**.
- 2 Unfasten the mounting 2 screws (4) and remove the terminal box cover (3).
- 3 Disconnect wire leads from the power supply.
- 4 Connect power supply wires (black, white and green) to the timer unit and to the circulator terminals (as shown in **FIG.2**).
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 5 Place the timer box cover (5) using the 2 mounting screws (4). Insure that all lead wires are inside the timer assembly.
- 6 Program the timer according to instructions provided on page 6.
- 7 Connect the unit to electrical supply.
- 8 Start the circulator.

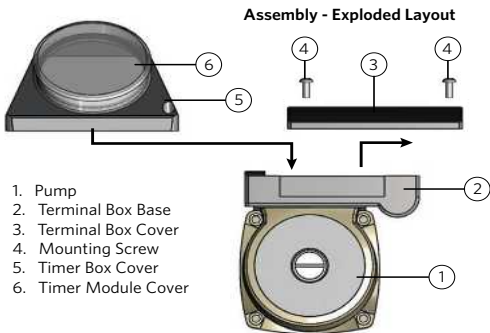


FIG. 1 Astro 2 Series circulator and 24-Hour Timer assembly drawing

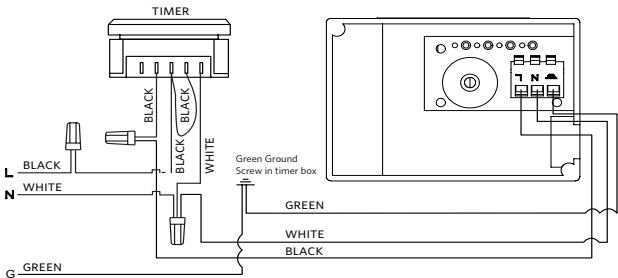


FIG. 2 Astro 2 Series circulator and 24-Hour Timer wiring diagram

6.0 AQUASTAT CONTROL ACCESSORY

TECHNICAL DATA	
Description	Aquastat (thermostatic) switch
Type	Surface sensing, snap acting bimetallic disc
Enclosure	Environmentally sealed
Switch modes*	105 ± 5°F (40 ± 2°C) pump switches OFF 85 ± 6°F (29 ± 3°C) pump switches ON
Contact position	Normally open
Mounting	½": Clip-on type for ⅝" o.d. system piping size (i.e., ½" I.D. copper tubing or ¾" steel pipe) ¾": Clip-on type for ⅞" o.d. system piping size (i.e., ¾" I.D. copper tubing or ½" steel pipe) May be mounted on either the inlet or outlet piping of the circulator.
Lead length	14" (356 mm)

*Temperatures indicated are at pipe surface

7.0 AQUASTAT INSTALLATION

- 1 Follow Steps 1, 2 and 3 in the Timer Installation section
- 2 The aquastat control is a surface temperature sensing device that must be in contact with the system piping to operate properly. Separate models include clip-on mounts for 3/4" (7/8" o.d.) and 1/2" (5/8" o.d.) copper tubing. (See FIG. 3)
- 3 Connect the black, green and white lead wires according to the wiring diagram (FIG. 4)
Note: Lead Wiring Specification - Minimum, 6" (152 mm) long, 14 AWG, rated minimum 140°F (60°C). Provided with R/C crimp connectors for attachment to the ground.
- 4 Close the terminal box cover and fasten the screw

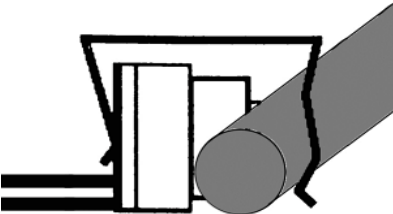


FIG. 3

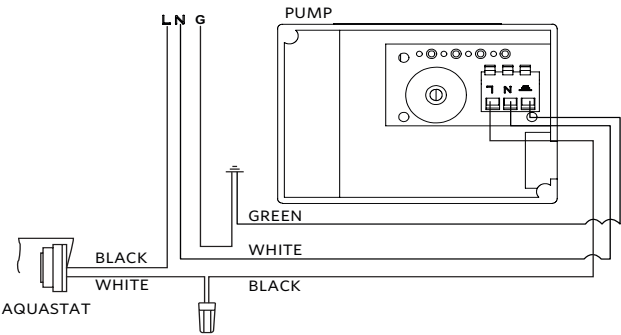


FIG. 4 Astro 2 Series circulator with Aquastat Control wiring diagram

8.0 TIMER AND AQUASTAT INSTALLATION

Follow the installation steps in both the Timer and Aquastat installation instructions and refer to Fig. 5 for the wiring connections.

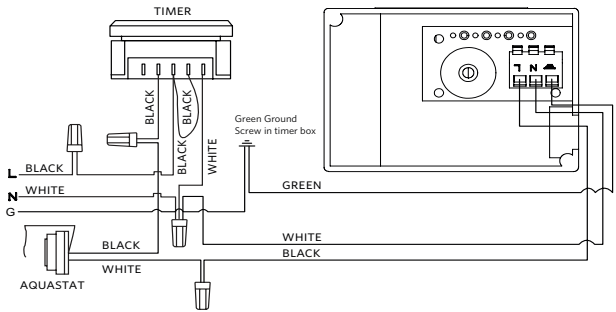


FIG. 5 Astro 2 Series circulator with 24-Hour Timer and Aquastat Control wiring diagram

9.0 TIMER PROGRAMMING WITH MANUAL
OVERRIDE SWITCH

Automatic Mode

In order to operate the time switch in the automatic mode, the manual switch must be in the center position. (See FIG. 6)

Manual Mode

With the manual switch selector lever the selected programs can be overridden. In the lower position, marked "o", terminals 3 and 5 are permanently closed. In the upper position, marked "I", terminals 3 and 4 are permanently closed. (See FIG. 6)

OVERRIDE MODE

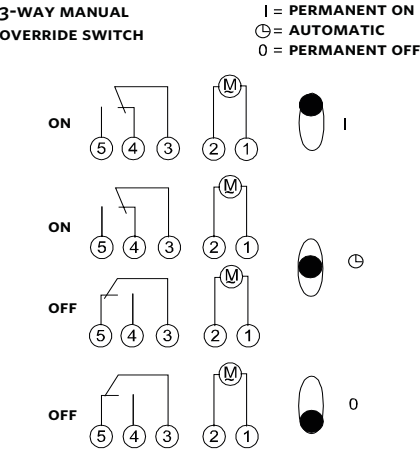


FIG. 6

INSTALLATION &
OPERATING INSTRUCTIONS

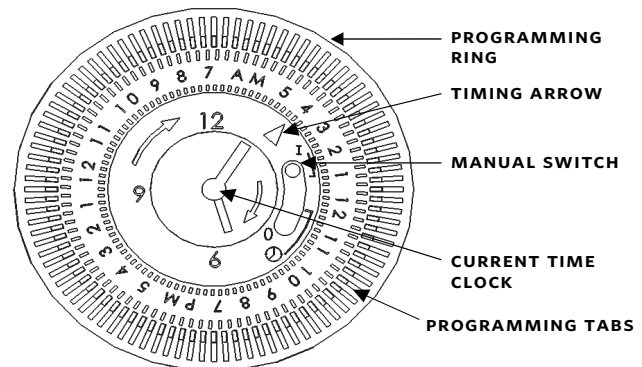
24-hour Timer and Aquastat
control accessory for Astro 2

4

TIMER PROGRAMMING

1. Set the current time by turning the programming ring clockwise until the timing arrow points to the current time of day.
2. Restore power to the circulator and set the manual switch on the timer dial to the "ON" position ("I").
3. Set the required "ON/OFF" times by pushing the programming tabs to the outer position for "ON" time intervals. For "OFF" ("O") operation keep the programming tabs in the inner position.
4. Set the manual switch to the center position, between the "I" and "O" on the timer dial in order to cycle the pump according to the programming tab settings. The pump will run continuously when the switch is set to "I" (ON) position. The "O" (OFF) position of the switch will shut the circulator off at all times.
5. In the event of power outage, the timer must be adjusted for the correct time of day after power is restored.

Note: The 24-hour timer requires manual resetting for daylight savings time.



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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

ET-1

Engineering Specification

Job Name _____

Contractor _____

Job Location _____

Approval _____

Engineer _____

Contractor's P.O. No. _____

Approval _____

Representative _____

LEAD FREE*

Series PLT Potable Water Expansion Tanks

Series PLT Potable Water Expansion Tanks are designed to absorb the increased volume of water created by thermal expansion and to maintain balanced pressure throughout the potable water supply system.

Heated water expands, and in a domestic hot water system, the system may be closed when the potable water system is isolated from the public water supply by a one-way valve such as pressure reducing valve, backflow preventer or check valve. Provisions must be made for this expansion.

Series PLT expansion tanks absorb the increased volume of water created when the hot water storage tank is heated and keeps the system pressure below the relief setting of the T&P relief valve.

It is a pre-pressurized steel tank with an expansion membrane that prevents contact of the water with the air in the tank. This prevents loss of air to the water and insures long and trouble-free life for the system. These tanks may be used with all types of Direct Fired Hot Water Heaters (gas, oil or electric) and hot water storage tanks.

Features

- Rugged flexible butyl diaphragm
- Field adjustable pre-charge
- In-line and free standing models
- Can be used with most standard hot water heaters and storage tanks

Models

PLT-5-M1	¾" male connection, tank volume 2.1 gal.
PLT-12-M1	¾" male connection, tank volume 4.5 gal.
PLT-20-M1	¾" male connection, tank volume 8.5 gal.
PLT-35-M1	1" female connection, tank volume 14.00 gal.

Specifications

The potable water expansion tank shall be of drawn steel construction. It shall have a Butyl diaphragm separating the air chamber from the water containing chamber. Inlet connector shall be Stainless Steel. Materials of manufacture for the diaphragm shall be FDA approved.

The potable water expansion tank shall be a Watts Model PLT.

PLT-20



Standards

Models PLT-5, PLT-12 and PLT-20

are Listed by IAPMO.

Certified to ANSI/NSF 61

Model PLT-35

Certified to ANSI/NSF 61



(73°F/23°C)

Note: The potable water expansion tank shall be installed in the cold water service pipe line on the supply side of the water heater (or water storage tank). A pressure relief valve sized and installed in accordance with local codes must be incorporated in the system.

In those systems requiring a combined temperature and pressure safety relief valve, the temperature and pressure relief valve should be sized and installed in accordance with local codes. Adequate drainage provisions should be provided where water flow will cause damage.

See chart on back

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

NOTICE

Inquire with governing authorities for local installation requirements

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.



Manufacturer : **WATTS**Model Number : **PLT-5**

Selection

This Quick Reference Selection Guide may be used as an alternative to using a formula to determine the correct expansion tank for the system. This table is based upon a relief valve setting of 150psi (10.3 bar), and a maximum of 50°F temperature rise.

To select the correct model PLT series tank, simply go the supply pressure equal to the system supply pressure (for pressures between those shown use next highest supply pressure shown), read across the chart to the correct tank as indicated by the water heater capacity (for capacities between those shown, use next highest capacity).

To accommodate the thermal expansion required for higher temperature and/or higher pressure systems, multiple tanks may be used. Please contact the factory for sizing information.

Materials

Diaphragm: Butyl rubber

Inlet Connection: Stainless Steel

Technical Information

DESCRIPTION	PLT-5	PLT-12	PLT-20	PLT-35
Max. Pressure - PSI	150	150	150	150
Max. Temp. - °F	200	200	200	200
Tank Volume - Gal.	2.1	4.5	8.5	14.00
Air Pre-charge - PSI	20	20	20	20
Connections Size - Inches	¾ Male	¾ Male	¾ Male	1 Female
Diameter - Inches	8	10.5	12.5	16.0
Length - Inches	11	13.5	19.2	21.7
Weight - Lbs.	5.5	10	15	32

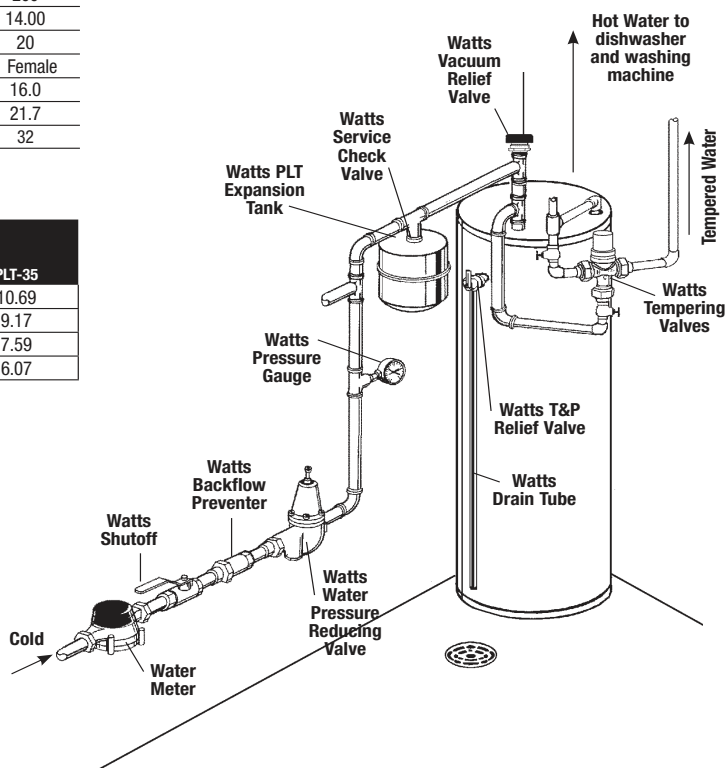
Acceptance Volume

AIR SIDE PRE-PRESSURE (PSI)	PLT-5	PLT-12	PLT-20	PLT-35
20	1.48	3.42	7.102	10.69
40	1.26	2.88	5.882	9.17
60	1.0	2.49	4.705	7.59
80	.8	1.85	4.009	6.07

SUPPLY PRESSURE (PSIG)	WATER HEATER (GALLONS)						
	20	30	40	50	80	100	120
40							
50							
55							
60							
70							
80							
90							
100							
110							
120							

PLT-5
 PLT-12
 PLT-20
 PLT-35

Multiple tanks required - consult factory



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ES-PLT 2048

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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

ET-2

ES-PLT

Engineering Specification

Job Name _____

Contractor _____

Job Location _____

Approval _____

Engineer _____

Contractor's P.O. No. _____

Approval _____

Representative _____

LEAD FREE***Series PLT**
Potable Water Expansion Tanks

Series PLT Potable Water Expansion Tanks are designed to absorb the increased volume of water created by thermal expansion and to maintain balanced pressure throughout the potable water supply system.

Heated water expands, and in a domestic hot water system, the system may be closed when the potable water system is isolated from the public water supply by a one-way valve such as pressure reducing valve, backflow preventer or check valve. Provisions must be made for this expansion.

Series PLT expansion tanks absorb the increased volume of water created when the hot water storage tank is heated and keeps the system pressure below the relief setting of the T&P relief valve.

It is a pre-pressurized steel tank with an expansion membrane that prevents contact of the water with the air in the tank. This prevents loss of air to the water and insures long and trouble-free life for the system. These tanks may be used with all types of Direct Fired Hot Water Heaters (gas, oil or electric) and hot water storage tanks.

Features

- Rugged flexible butyl diaphragm
- Field adjustable pre-charge
- In-line and free standing models
- Can be used with most standard hot water heaters and storage tanks

Models

PLT-5-M1	¾" male connection, tank volume 2.1 gal.
PLT-12-M1	¾" male connection, tank volume 4.5 gal.
PLT-20-M1	¾" male connection, tank volume 8.5 gal.
PLT-35-M1	1" female connection, tank volume 14.00 gal.

Specifications

The potable water expansion tank shall be of drawn steel construction. It shall have a Butyl diaphragm separating the air chamber from the water containing chamber. Inlet connector shall be Stainless Steel. Materials of manufacture for the diaphragm shall be FDA approved.

The potable water expansion tank shall be a Watts Model PLT.

PLT-20

**Standards**

Models PLT-5, PLT-12 and PLT-20

are Listed by IAPMO.

Certified to ANSI/NSF 61

Model PLT-35

Certified to ANSI/NSF 61



(73°F/23°C)

Note: The potable water expansion tank shall be installed in the cold water service pipe line on the supply side of the water heater (or water storage tank). A pressure relief valve sized and installed in accordance with local codes must be incorporated in the system.

In those systems requiring a combined temperature and pressure safety relief valve, the temperature and pressure relief valve should be sized and installed in accordance with local codes. Adequate drainage provisions should be provided where water flow will cause damage.

See chart on back

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***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.



Manufacturer : WATTS

Model Number : PLT-12

Selection

This Quick Reference Selection Guide may be used as an alternative to using a formula to determine the correct expansion tank for the system. This table is based upon a relief valve setting of 150psi (10.3 bar), and a maximum of 50°F temperature rise.

To select the correct model PLT series tank, simply go the supply pressure equal to the system supply pressure (for pressures between those shown use next highest supply pressure shown), read across the chart to the correct tank as indicated by the water heater capacity (for capacities between those shown, use next highest capacity).

To accommodate the thermal expansion required for higher temperature and/or higher pressure systems, multiple tanks may be used. Please contact the factory for sizing information.

Materials

Diaphragm: Butyl rubber

Inlet Connection: Stainless Steel

Technical Information

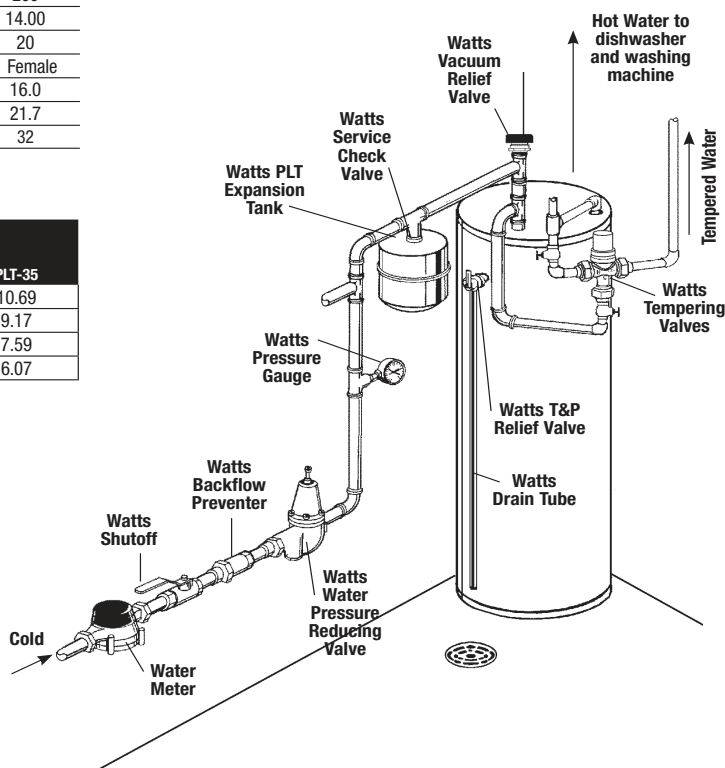
DESCRIPTION	PLT-5	PLT-12	PLT-20	PLT-35
Max. Pressure - PSI	150	150	150	150
Max. Temp. - °F	200	200	200	200
Tank Volume - Gal.	2.1	4.5	8.5	14.00
Air Pre-charge - PSI	20	20	20	20
Connections Size - Inches	¾ Male	¾ Male	¾ Male	1 Female
Diameter - Inches	8	10.5	12.5	16.0
Length - Inches	11	13.5	19.2	21.7
Weight - Lbs.	5.5	10	15	32

Acceptance Volume

AIR SIDE PRE-PRESSURE (PSI)	PLT-5	PLT-12	PLT-20	PLT-35
20	1.48	3.42	7.102	10.69
40	1.26	2.88	5.882	9.17
60	1.0	2.49	4.705	7.59
80	.8	1.85	4.009	6.07

SUPPLY PRESSURE (PSIG)	WATER HEATER (GALLONS)						
	20	30	40	50	80	100	120
40							
50							
55							
60							
70							
80							
90							
100							
110							
120							

PLT-5 PLT-20
 PLT-12 PLT-35
 Multiple tanks required - consult factory



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 Canada: T: (888) 208-8927 • F: (905) 332-7068 • Watts.ca
 Latin America: T: (52) 55-4122-0138 • Watts.com

ES-PLT 2048

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2.16 HIGHLANDS BUILDING ROGERS

Datasheets

SP-1

ELV-SERIES

Elevator Sump Pump Systems with OilTector® Control

Liberty Pumps®

A Family and Employee Owned Company

Ideal for elevators, garages and areas where the discharge of oil/hydrocarbons into the environment is prohibited. Compliant with ASME A17.1.

Features

- Complete packaged system
- 1/3, 1/2 or 3/4 hp Sump pump
- 1-1/2" Discharge
- OilTector® control
- Remote alarm
- 115 or 230V Pump models
- Easy clamp-mount installation, with plug-in ready wiring



Control Panel



Remote Alarm



Sensor Module

The OilTector® control system is designed and approved for safe operation of pumping, alarming and monitoring of elevator sump pits, transformer vaults and other applications where oil and water must be detected. The OilTector® system will activate the pump to remove water from elevator pits in accordance with ASME A17.1, and will provide pumping of only water - even if an oil condition is detected. The OilTector® cycles the pump only in the water range. Oil and other harmful substances are not discharged into the environment. An alarm is activated in the event of a high water condition or high oil condition.

Level Sensor



innovate. evolve.

ELV-Series System with OilTector® Control

Advanced Control Panel



Control Panel Features

- Oil resistant SJEOOW cord, 25' standard length (6' and 50' lengths available)
- Easy clamp mounted pre-set level sensor holder
- No field adjustments required. OilTector® will turn pumps ON and OFF, sound the high water alarm, and high oil alarm with one easy installation
- See-through door, separate pump and control circuits - NEMA 4X enclosure.
- Height 10.0" x width 7.5" x depth 5.5"
- Plug-in ready pump cord and control panel cord for quick and easy installation
- Remote alarm with auxiliary contacts for connection to building automation or SCADA system, 24-Volt AC/DC, 500 mA max switching
- Power ON, Pump Run, High water and High oil lights
- ASME A17.1 compliant

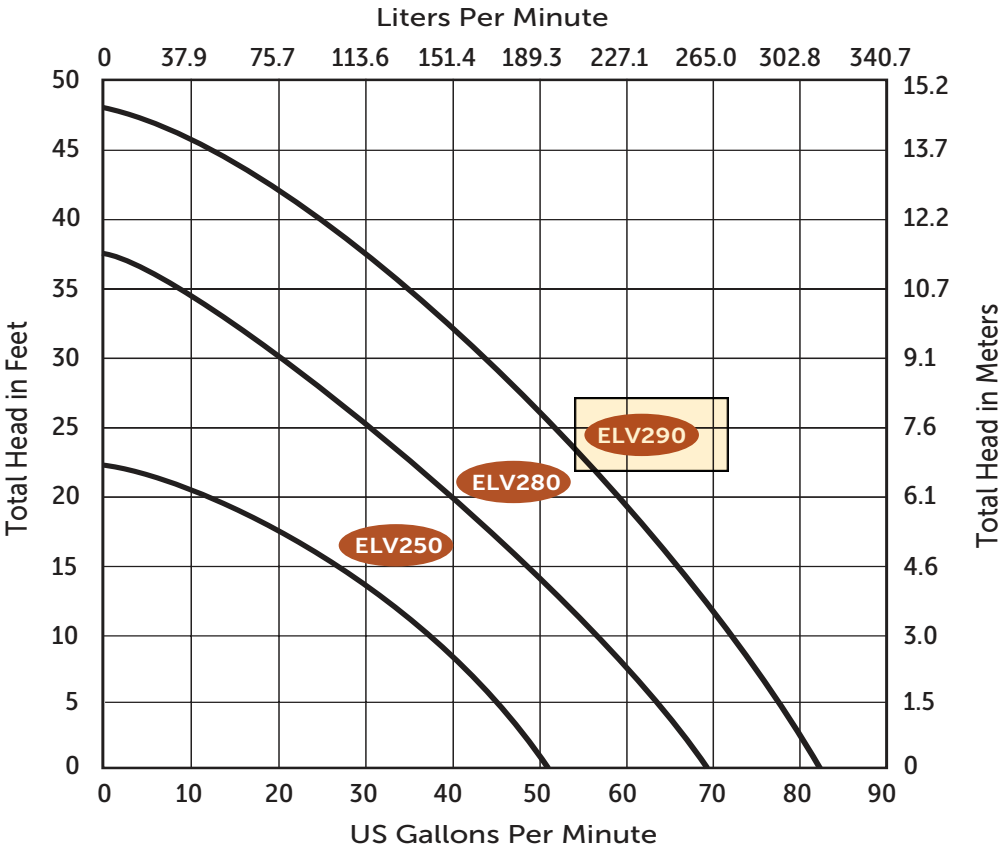
- A Power Indicator Light**
When lit, indicates there is power
- B High Water Alarm**
When lit, indicates that there is a potential pump problem
- C High Oil Alarm**
When lit, indicates that there is a large amount of oil in the system and needs to be investigated
- D Pump Run Light**
When lit, indicates pump is running

Operation

On water rise, the pump will activate when the water level reaches the "pump on" probe. Pump will remain on until the water level is below the "pump off" probe. When the "pump off" probe no longer senses water it turns the pump off, air and/or oil are ignored and an oil layer (if present) will not be pumped out of the sump. If the liquid level reaches the "alarm" probe and mechanical float, the system will differentiate between water and oil and activate the appropriate alarm.

Performance Curve

60 Hz, 3450 RPM



Pump Options



250-Series
60 Hz



280-Series
60 Hz



290-Series
60 Hz

ELV-Series System with OilTector® Control

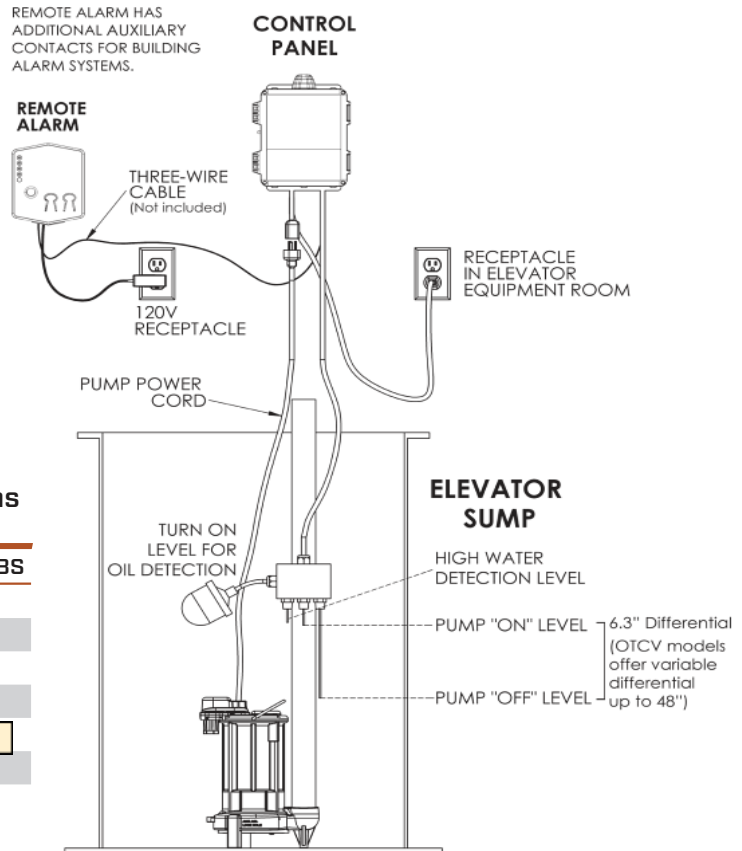
Pump Only Models

MODEL	HP	VOLTS	WEIGHT IN LBS
EV250	1/3	115	24
EV250HV	1/3	230	24
EV280	1/2	115	30
EV280HV	1/2	230	30
EV290	3/4	115	32
EV290HV	3/4	230	32

Above models supplied with standard 25' pump power cord.
For 6' or 50' pump power cords add -06 or -5 respectively.
Example: ELV290-06 for 6' pump power cord.

ELV-Series Complete Sump Pump Systems (Pump, OilTector® Control, Alarm)

MODEL	HP	VOLTS	WEIGHT IN LBS
ELV250	1/3	115	34
ELV250HV	1/3	230	34
ELV280	1/2	115	40
ELV280HV	1/2	230	40
ELV290	3/4	115	42
ELV290HV	3/4	230	42



OilTector® Control & Alarm Only

MODEL	MAX HP	VOLTS	MAX AMP	CORD LENGTH	WEIGHT IN LBS	DIFFERENTIAL
OTC-115	1	115	15	25'	11	6.3"
OTC-230	2	230	15	25'	11	6.3"
OTC-115-5	1	115	15	50'	12	6.3"
OTC-230-5	2	230	15	50'	12	6.3"
OTCV-115	1	115	15	50'	13	Up to 48"
OTCV-230	2	230	15	50'	13	Up to 48"

Optional 3-Phase OilTector® Controls

MODEL	VOLTS	MAX AMP	CORD LENGTH	WEIGHT IN LBS	DIFFERENTIAL
OTC-34-141	208/230/460	2.5-4	25'	13	6.3"
OTC-34-171	208/230/460	4-6	25'	13	6.3"
OTC-34-191	208/230/460	6-10	25'	13	6.3"
OTC-34-511	208/230/460	9-14	25'	13	6.3"

Consult factory for available 3-phase options.

Specifications subject to change without notice.

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Phone 800-543-2550 - Fax 585-494-1839 - LibertyPumps.com

STANDARD CHECK VALVES



Economy Check Valves



CV2N1 1-1/4" and 1-1/2" combo

CV150 1-1/2"

CV200 2"

- ABS valve body
- Rubber slip connect with hose clamps
- Vertical or horizontal installation
- 15 PSI rated at 104°F for CV2N1 and CV150
- 25 PSI rated at 140°F for CV200

Thread X Barb Fit



CV150-125T 1-1/2" MPT x 1-1/4" Barb

CV150-150T 1-1/2" MPT x 1-1/2" Barb

- PVC construction
- Thread directly into 1-1/2" sump pump discharge
- 30 PSI rated at 104°F

Cast Iron High-temperature 200°F



HCV150/200



HCV300

HCV150 1-1/2"

HCV200 2"

HCV300 3"

- Heavy-duty cast iron body
- Full flow
- High-temperature rubber flapper - 200°F
- 125 PSI rated
- Vertical or horizontal installation
- Female NPT connections

Ball/Check/Union Combination



BCV150 1-1/2"

BCV200 2"

- Ball/check combo provides compact design
- Heavy-duty PVC
- 150 PSI rated at 72°F
- 30 PSI rated at 140°F
- Vertical or horizontal installation
- Features union for easy disassembly
- Socket weld connections

Heavy-Duty Compression Fit



CV2N1C 1-1/4" and 1-1/2" combo

CV200C 2"

CV300C 3"

- Heavy-duty PVC
- Vertical or horizontal installation
- 150 PSI rated at 72°F for CV2N1C and CV200C
- 30 PSI rated at 140°F for CV2N1C and CV200C
- 125 PSI rated at 72°F for CV300C
- 25 PSI rated at 140°F for CV300C



Specifications subject to change without notice.

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