OPERATING INSTRUCTIONS
1/24/01

OSRAM
SYLVANIA
Process Heat

THREADED INLINE HEATERS

038821, 038822, 038823, 038824,
038825, 038826, 063007

⇒ **FOR SAFETY AND LONG HEATER LIFE, CAREFULLY READ THIS MANUAL BEFORE USE.**

Description

- Stainless Steel threaded heaters for heating high-pressure air or inert gases to 1400°F (760°C). Sizes from 3/8" to 2-1/2" diameter, and in wattages from 1.6 to 18 Kilowatts. If operated correctly, the heater will operate continuously for 5000 hours or longer.

Specifications

MAXIMUM INLET PRESSURE 150 PSI (10 BAR)

PART NUMBER	MAXIMUM WATTS	MAXIMUM VOLTS	MAXIMUM AMP DRAW	MAXIMUM TEMP. (°F/°C)	STYLE
038821	1600	170	9.4	1400/760	A
038822	1600	170	9.4	1400/760	B
038823	4000	220	18.2	1400/760	A
038824	4000	220	18.2	1400/760	B
038825	6000	220	27.3	1000/540	A
038826	6000	220	27.3	1000/540	B
063007	18000	240	75 (1ph)/ 44 (3ph)	1000/540	B

Safety

- **SHOCK HAZARD** Only qualified individuals should install this heater and related controls. Follow all applicable electrical codes and use proper wiring.
- **BURN/FIRE/EXPLOSION HAZARD** Do not use with or near explosive or reactive gases. Avoid contact with the side, or exposure to the exit-end, during or soon after operation. DO NOT USE NEAR VOLATILE OR COMBUSTIBLE MATERIALS.

Precautions

- Use filtered air. Avoid grease, oil, or oil vapors, corrosive or reactive gases which will damage heater.
- Operate at safe voltages as shown on the PERFORMANCE CURVES. Excess voltage will cause premature failure.

- ❑ Always have sufficient airflow through the heater before applying power. Otherwise element will overheat very quickly, and burn out. **NOTE:** A thermocouple cannot detect temperatures if there is no flow – turn on flow before applying power, even when a controller with a thermocouple is being used.
- ❑ Use style 'A' inline heaters for absolute leak-proof applications (150 PSI). Style 'B' Inline heaters will have some air leakage through the lead wires.
- ❑ Use phase angle fired power controllers. On-off controllers may shorten heater life (or burnout element).
- ❑ For closed-loop control, use exposed junction type "K" thermocouple within one inch of the heater exit.
- ❑ For closed-loop control, use a temperature controller with a fast sampling period (500ms) and minimal overshoot.

Installation

- Securely mount the heater.

FOR 3/8", ½", AND 1 ¼" HEATER ONLY (#038821, 038822, 038823, 038824, 038825, AND 038826):
- There are two feedthroughs on the heater. Each feedthrough has three wires (marked 1, 2, or 3) coming out of it.
- Connect one power lead to one heater electrical feedthrough (or one lead wire) and connect the other power lead to the other electrical feedthrough. (or other lead wire).
- Connect the ground wire to the green grounding nut on the heater body.
- Connect the air source to the heater.
- If a thermocouple is used, ensure that it is located within one inch from the heater exit.

FOR 2 ½" HEATER ONLY (#063007):
18,000 WATT - 240 VOLT - SINGLE PHASE OPERATION:
- Each of the two heater feedthroughs has three wires (marked 1, 2, or 3) coming out of it.
- Connect one side of power to all three leads that exit one feedthrough (1, 2, and 3 together).
- Connect the other side of the power to all three leads that exit the second feedthrough (1, 2, and 3 together).
- Make sure the heater is properly grounded. Note: Run single phase, 240 volts, the heater will draw 75 Amps.
- Connect the air source to the heater.
- If a thermocouple is used, ensure that it is located within one inch from the heater exit.

18,000 WATT - 240 VOLT - THREE PHASE OPERATION:
- Each of the two heater feedthroughs have three wires (marked 1, 2, or 3) coming out of it.
- Connect the elements in a standard delta configuration. (Connect one power lead to each of the following pairs: 1-2, 2-3, 3-1).
- Make sure the heater is properly grounded.
- Note: Run three phase, 240 volts, the heater will draw 44 Amps.
- Connect the filtered air source to the heater.
- If a thermocouple is used, ensure that it is located within one inch from the heater exit.

Start-up

- Reference the PERFORMANCE CURVES section for operational parameters before attempting to operate heater(s).
- Turn on air supply and adjust to desired flow/pressure.
- If using a closed loop system, turn on power to the temperature and power controller, then set the desired temperature on the temperature controller. If using an open loop system, increase power to the heater through the power controller until the desired temperature is attained.

Performance Curves

The attached performance curves show exit air temperatures at different airflows and voltages. Pressure readings (longer dashed lines) are measured at the inlet to the heater with no entrance or exit restrictions. Solid lines indicate safe, normal-life operating conditions. The shorter dash lines indicate marginal, shorter-life operating conditions leading to premature burnout. With a known flow (or pressure) at the heater entrance, follow the flow (or pressure) line across until it meets the desired temperature curve. Drop a line straight down to intersect the x-axis. This point, along the "Heater volts – true RMS" axis, represents the voltage required to generate the desired exit air temperature at the chosen flow rate (inlet pressure).

Warranty

OSRAM SYLVANIA warrants that all products to be delivered hereunder will be free from defects in material and workmanship at the time of delivery. OSRAM SYLVANIA's obligation under this warranty shall be limited to (at its option) repairing, replacing, or granting a credit at the prices invoiced at the time of shipment for any of said products. This warranty shall not apply to any such products which shall have been repaired or altered, except by OSRAM SYLVANIA, or which shall have been subjected. OSRAM SYLVANIA shall be liable under this warranty only if (A) OSRAM SYLVANIA receives notice of the alleged defect within sixty (60) days after the date of shipment; (B) the adjustment procedure hereinafter provided is followed, and (C) such products are, to OSRAM SYLVANIA's satisfaction, determined to be defective.

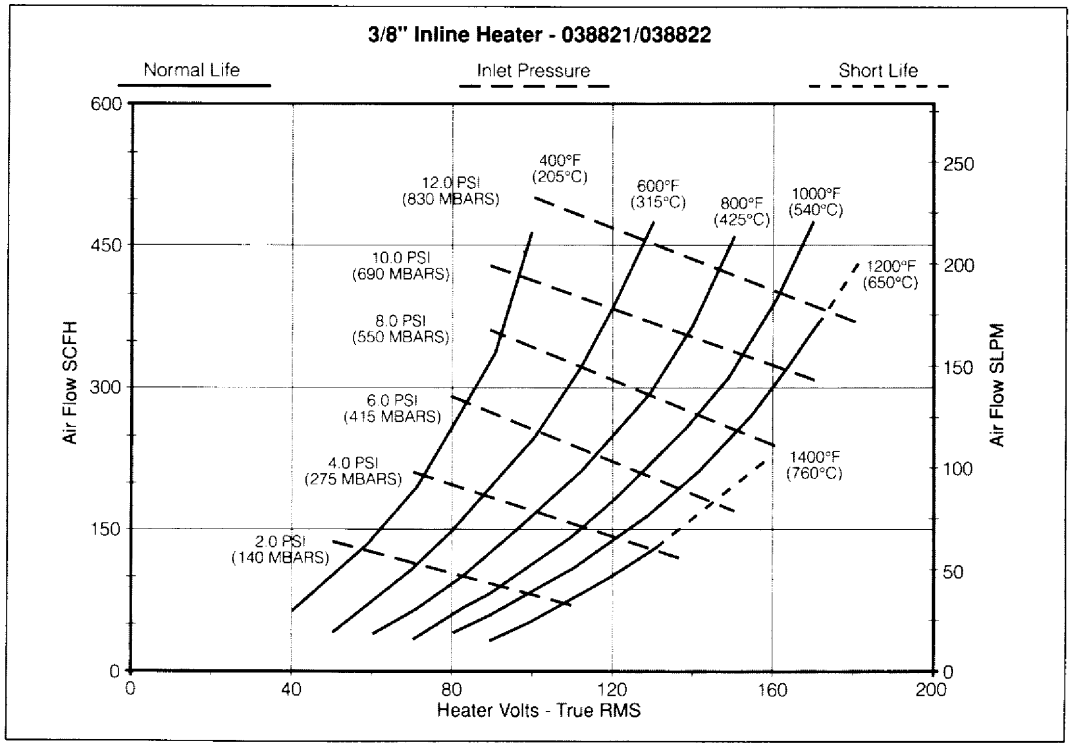
THE WARRANTY SET FORTH IN THE PRECEDING PARAGRAPH IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY.

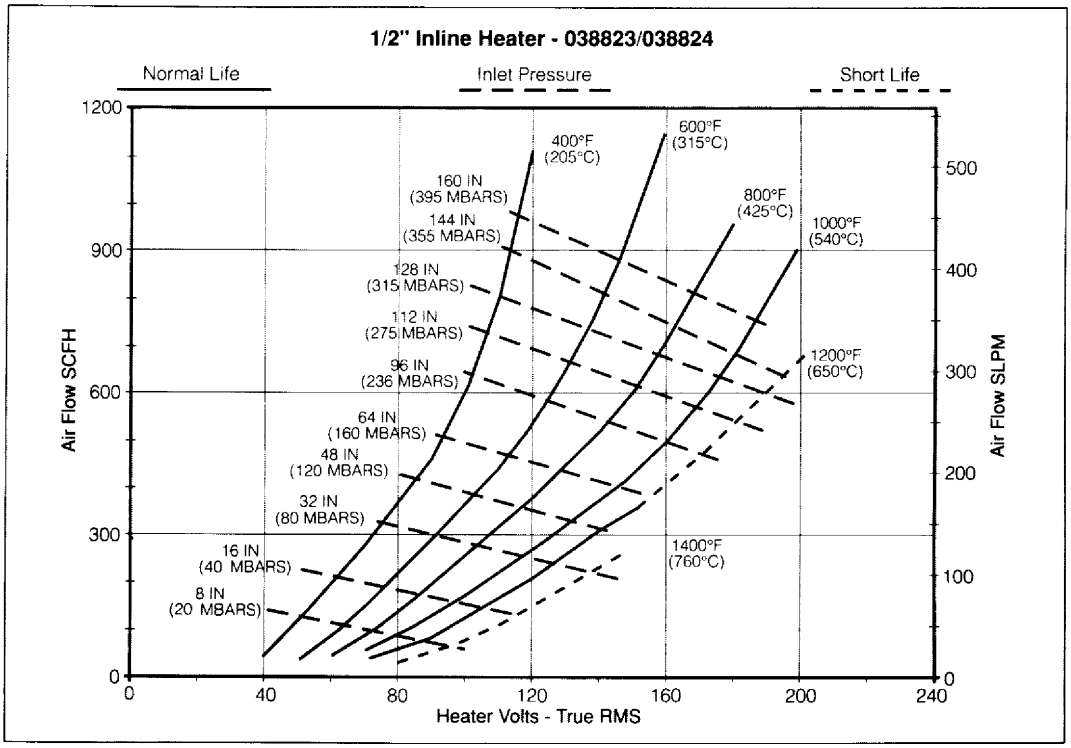
The information contained in this manual is based on data considered to be true and accurate. Reasonable precautions for accuracy has been taken in the preparation of this manual, however OSRAM SYLVANIA assumes no responsibility for any omissions or errors, nor assumes any liability for damages that may result from the use of the product in accordance with the information contained in this manual.

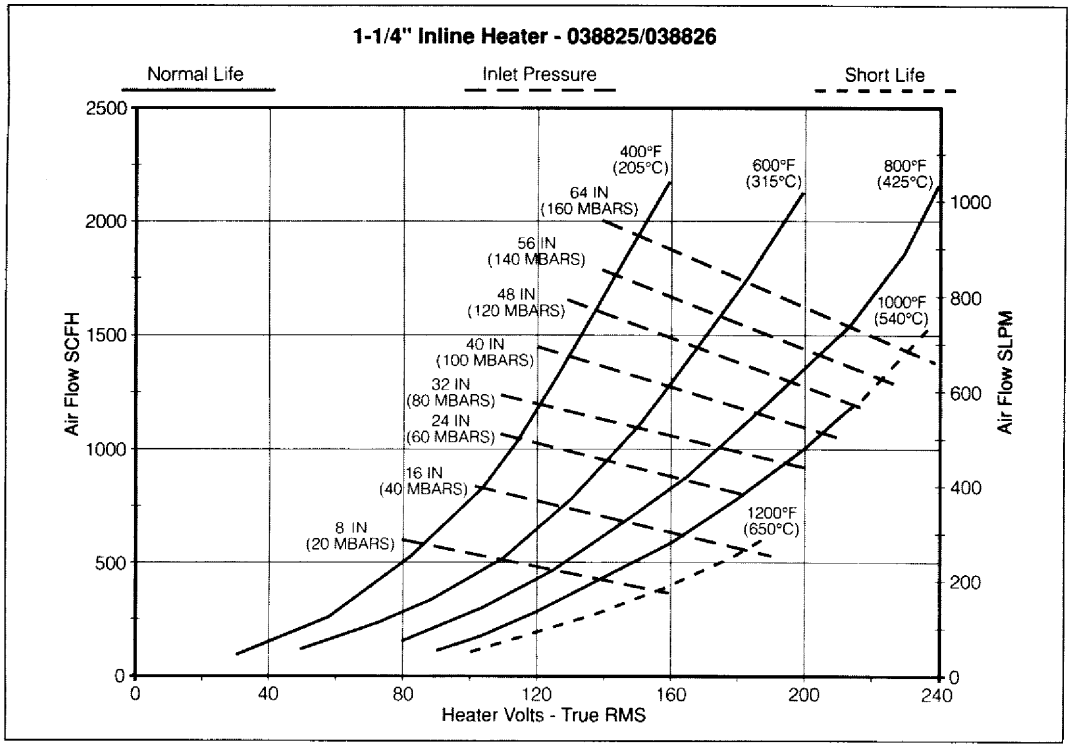
Please direct all warranty/repair requests or inquiries to the place of purchase, and provide the following information, in writing:

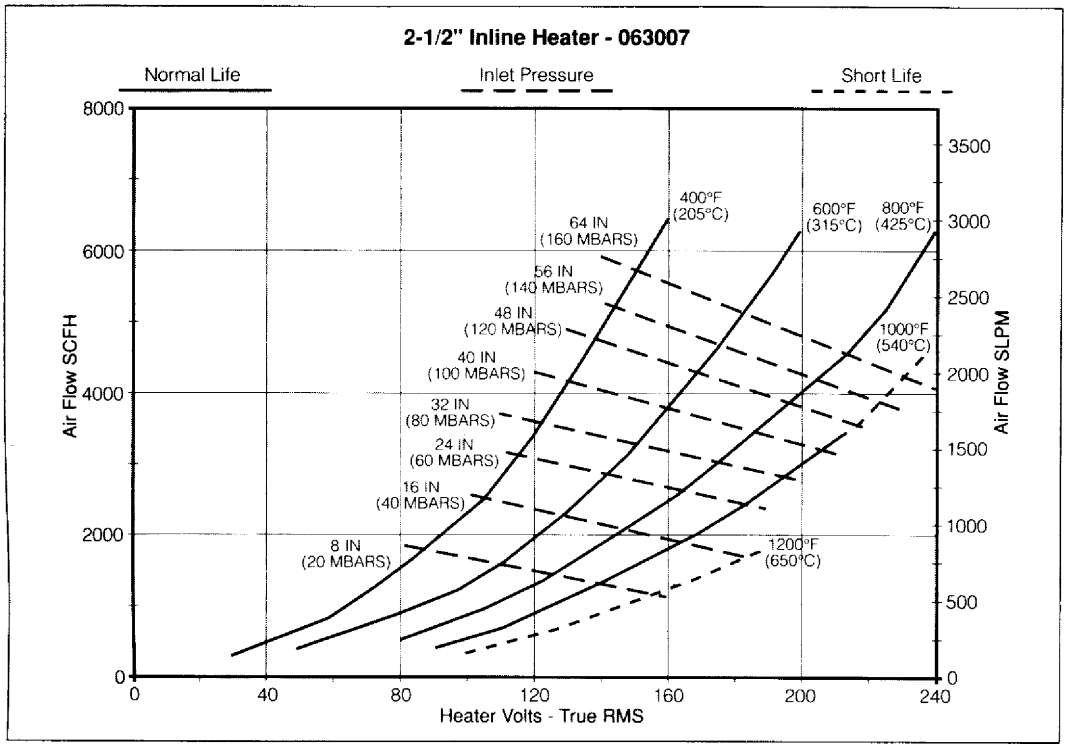
(A) Order number under which products were shipped
(B) Model/Serial Number of product
(C) Reason for rejection

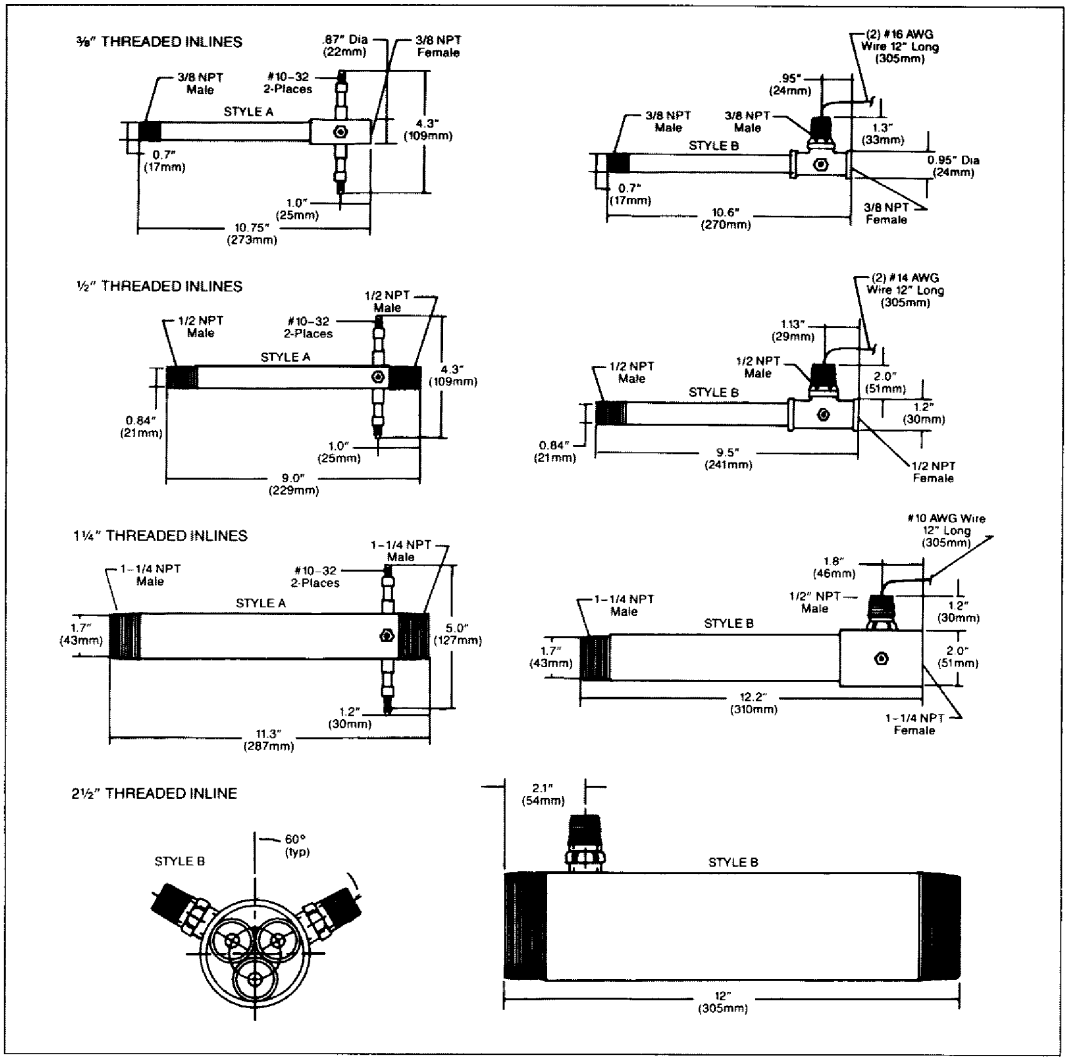
PRODUCTS CAN NOT BE RETURNED TO OSRAM SYLVANIA WITHOUT AUTHORIZATION.
Replacement, repair, or credit for products found to be defective will be made by the place of purchase. All products found to be not defective will be returned to the Buyer; transportation charges collect or stored at Buyers expense.


3/8" Inline Heater - 038821/038822
Normal Life
Inlet Pressure
Short Life
Air Flow SCFH
Air Flow SLPM
Heater Volts - True RMS
600
450
300
150
0
250
200
150
100
50
0
40
80
120
160
200
12.0 PSI (830 MBARS)
10.0 PSI (690 MBARS)
8.0 PSI (550 MBARS)
6.0 PSI (415 MBARS)
4.0 PSI (275 MBARS)
2.0 PSI (140 MBARS)
400°F (205°C)
600°F (315°C)
800°F (425°C)
1000°F (540°C)
1200°F (650°C)
1400°F (760°C)


1/2" Inline Heater - 038823/038824
Normal Life
Inlet Pressure
Short Life
Air Flow SCFH
Air Flow SLPM
Heater Volts - True RMS
1200
900
600
300
0
500
400
300
200
100
0
40
80
120
160
200
240
160 IN (395 MBARS)
144 IN (355 MBARS)
128 IN (315 MBARS)
112 IN (275 MBARS)
96 IN (236 MBARS)
64 IN (160 MBARS)
48 IN (120 MBARS)
32 IN (80 MBARS)
16 IN (40 MBARS)
8 IN (20 MBARS)
400°F (205°C)
600°F (315°C)
800°F (425°C)
1000°F (540°C)
1200°F (650°C)
1400°F (760°C)


1-1/4" Inline Heater - 038825/038826
Normal Life
Inlet Pressure
Short Life
Air Flow SCFH
Air Flow SLPM
Heater Volts - True RMS
400°F (205°C)
600°F (315°C)
800°F (425°C)
1000°F (540°C)
1200°F (650°C)
64 IN (160 MBARS)
56 IN (140 MBARS)
48 IN (120 MBARS)
40 IN (100 MBARS)
32 IN (80 MBARS)
24 IN (60 MBARS)
16 IN (40 MBARS)
8 IN (20 MBARS)


2-1/2" Inline Heater - 063007
Normal Life
Inlet Pressure
Short Life
Air Flow SCFH
Air Flow SLPM
Heater Volts - True RMS
400°F (205°C)
600°F (315°C)
800°F (425°C)
1000°F (540°C)
1200°F (650°C)
64 IN (160 MBARS)
56 IN (140 MBARS)
48 IN (120 MBARS)
40 IN (100 MBARS)
32 IN (80 MBARS)
24 IN (60 MBARS)
16 IN (40 MBARS)
8 IN (20 MBARS)


⅜" THREADED INLINES
.87" Dia (22mm)
3/8 NPT Female
3/8 NPT Male
#10-32 2-Places
STYLE A
4.3" (109mm)
0.7" (17mm)
1.0" (25mm)
10.75" (273mm)
(2) #16 AWG Wire 12" Long (305mm)
.95" (24mm)
3/8 NPT Male
3/8 NPT Male
1.3" (33mm)
STYLE B
0.95" Dia (24mm)
0.7" (17mm)
10.6" (270mm)
3/8 NPT Female
½" THREADED INLINES
1/2 NPT Male
1/2 NPT Male
#10-32 2-Places
STYLE A
4.3" (109mm)
0.84" (21mm)
1.0" (25mm)
9.0" (229mm)
(2) #14 AWG Wire 12" Long (305mm)
1.13" (29mm)
1/2 NPT Male
1/2 NPT Male
2.0" (51mm)
STYLE B
1.2" (30mm)
0.84" (21mm)
9.5" (241mm)
1/2 NPT Female
1¼" THREADED INLINES
1-1/4 NPT Male
1-1/4 NPT Male
#10-32 2-Places
STYLE A
1.7" (43mm)
5.0" (127mm)
1.2" (30mm)
11.3" (287mm)
#10 AWG Wire 12" Long (305mm)
1.8" (46mm)
1-1/4 NPT Male
1/2" NPT Male
1.2" (30mm)
STYLE B
1.7" (43mm)
2.0" (51mm)
12.2" (310mm)
1-1/4 NPT Female
2½" THREADED INLINE
STYLE B
60° (typ)
2.1" (54mm)
STYLE B
12" (305mm)