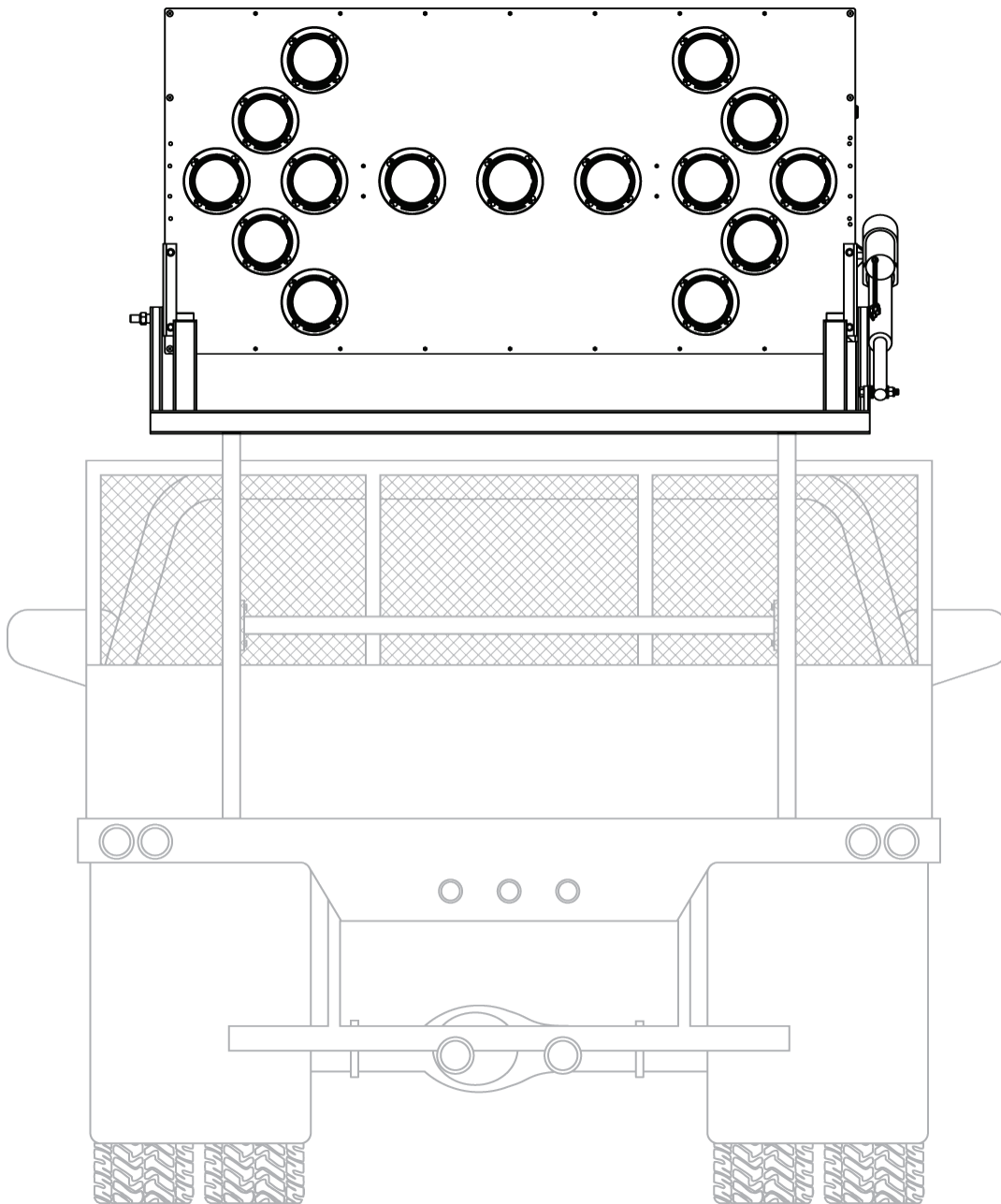


TRUCK-MOUNT ARROW BOARDS

MODELS WB, WFB, WFP, WLP & WVGB
PRODUCT SPECIFICATIONS | OCTOBER 2014



- 2.4. Application Common applications include:
- Roadwork zones
 - Road striping convoys
 - Road sweeping convoys
 - Pothole repairs
 - Crash cushion (TMA) trucks

3. DISPLAY

3.1. Panel

- 3.1.1. Description Weather-resistant cabinet provides a rigid platform for LED lamps
- 3.1.2. Construction Outer frame constructed of aluminum channel, 3" x 1" x 1/8" thick. Two interior channels add strength and prevent distortion of front and rear panels. All channel joints are welded.
- Front and rear panels constructed of aluminum sheet, 5052-H32, 0.062" (1.575mm) thick. Panels are riveted and screwed to frame and interior channels.
- 3.1.3. Finish Oven-baked, flat-black (10% gloss), powder-coat finish ensures durability and corrosion protection. Panel assembly is high-pressure phosphate-washed prior to finish coat.

3.2. Lights

- 3.2.1. Description Display lights are laid out across the front face of the display panel. The layout allows for a variety of arrows and other patterns to appear depending on which lights are lit. The desired pattern is selected by the operator, using the arrow board controls.
- 3.2.2. Type
- | | |
|--------------|------------------------------------|
| 24 x 48 size | PAR 36 LED lamp, 4½" (11.5cm) dia. |
| 30 x 60 size | |
| 36 x 72 size | PAR 46 LED lamp, 5¾" (14.5cm) dia. |
| 48 x 96 size | |
- See Options and Optional Equipment for other lamps
- 3.2.3. Light output
- | | |
|--------------|------------------------|
| 24 x 48 size | 121 cd max. brightness |
| 30 x 60 size | |
| 36 x 72 size | 320 cd max. brightness |
| 48 x 96 size | |
- 3.2.4. Reverse-polarity protection Protects lamps if control box wiring is connected backwards (which sometimes happens after servicing)

3.2.5.	LEDs	Technology	AllnGaP II (aluminum indium gallium phosphide) technology, T-1½ size
		Color range	Amber, 590 to 593 nm
		Forward voltage	2.0 to 2.1Vdc @ 20mA
		Temperature limits	Operating temperature, -22 to 185°F (-30 to 85°C)
3.2.6.	Lens	Function	Each lamp has an integrated hex lens that enhances the brightness and angularity of each LED while reducing power consumption
		Material	Acrylic
		Beam angle	Horizontal: 16.8 degrees, ±8.4 degrees Vertical: 9.5 degrees, ± 4.75 degrees Angle determined by 10% of peak candle power (certified by independent testing laboratory)
3.2.7.	Visor	Function	Each lamp is shrouded by a visor that enhances visibility by shading the lamp and preventing glare
		Material	High-impact ABS plastic
		Mounting	Four keyed slots enable visor to be removed from the display panel without removing screws
3.2.8.	Visibility	24 x 48 size	0.5 mile (0.8km)
		30 x 60 size	0.75 mile (1.2km)
		36 x 72 size	
		48 x 96 size	1 mile (1.6km)
3.2.9.	Replacement	Lamps can be replaced in less than two minutes. The only tool needed is a Philips screwdriver.	
3.3.	Standards	Meets MUTCD Part VI, Traffic Control for Street & Highway Construction and Maintenance Including Utility and Emergency Operations, Section 6C.3	
		24 x 48 size	MUTCD Type A
		30 x 60 size	MUTCD Type B
		36 x 72 size	
		48 x 96 size	MUTCD Type C

4. CONTROLLER

- 4.1. Function Allows operator to choose an arrow or other display pattern. Maintains display flash-rate and controls automatic dimming. Two models: one for flashing-only display patterns, another for flashing and sequential patterns; choice depends on user requirements.
- 4.2. Control box
- 4.2.1. Enclosure
- | | |
|--------------|--|
| Construction | Polycarbonate-ABS plastic |
| Size | Flashing-only model: 4.5" x 2.9" x 2" (11.4 x 7.3 x 5.1cm), W x H x D
Sequential model: 6.6" x 2.9" x 2.3" (16.8 x 7.3 x 5.8cm), W x H x D
Size does not account for mounting bracket or wiring connectors |
- 4.2.2. Wiring 15-foot (4.57m) cable with wiring connector at free end; hard-wired to arrow board, connected by installer to back of control box inside truck cab
- 18ga. standard wire in weatherproof cable
- See "Options and Optional Equipment" for cable length options
- 4.2.3. Location User-installed, typically inside truck cab under dashboard
- 4.2.4. Mounting Adjustable steel mounting bracket attaches to truck with bolts, provided; allows for vertical angle of control box to be adjusted; requires space behind control box for wiring connections
- 4.2.5. Serviceability Entire control box is removable for easy exchange and factory servicing
- 4.3. Control panel
- 4.3.1. Display switch Control box for sequential models has a toggle switch for turning arrow board display on and off; for flashing models, display pattern rotary switch includes "off" position
- 4.3.2. Display pattern selection Rotary switch: operator simply points the switch at the desired display pattern, which is silkscreened onto the front of the control panel
- 4.3.3. Tilt switch Toggle switch for controlling optional power-operated tilt-frame
- See "Options and Optional Equipment" for mounting-frame options
- 4.3.4. Brightness switch Toggle switch for controlling arrow board display brightness and optional automatic dimming
- See "Options and Optional Equipment" for automatic dimming option
- 4.3.5. LED indicators
- | | |
|------------------|---|
| All models | Indicator lights when power to arrow board display is on |
| Sequential model | Indicator lights while operating tilt switch
LEDs laid out in a grid show selected display pattern |

4.4. Display patterns

4.4.1. All models All arrow boards can display any of the following 5 patterns (for samples, see Exhibit B):

Flashing arrow, left or right	10 lights total 5 lights form arrowhead 5 lights form stem
Flashing double arrow	13 lights total 5 lights form each arrowhead 3 lights form stem
Flashing four-corner warning	4 lights total 1 light at each corner
Flashing caution-bar warning	7 lights form horizontal bar across center of display panel
Sequencing left or right stem arrow	10 lights total 5 lights form arrowhead 5 lights form full stem 1st pulse: 2 far stem lights 2nd pulse: 4 far stem lights 3rd pulse: full arrow shape 4th pulse: blank display

4.4.2. Sequential models In addition to the patterns described above, 15- and 25-light arrow boards with sequential capability can display the following 2 patterns (for samples, see Exhibit B):

Sequencing stem with arrow, left or right	10 lights total 5 lights form arrowhead 5 lights form full stem 1st pulse: 2 far stem lights 2nd pulse: 4 far stem lights 3rd pulse: full arrow shape 4th pulse: blank display
---	--

4.4.3. 25-light models In addition to the patterns described above, 25-light arrow boards can display any of the following 5 patterns (for samples, see Exhibit B):

Sequencing arrow, left or right	10 lights total 5 lights form arrowhead 5 lights form full stem 1st pulse: 2 far stem lights with arrowhead 2nd pulse: 3 far stem lights with arrowhead 3rd pulse: full arrow shape 4th pulse: blank display
---------------------------------	--

- Sequencing chevron arrows, left or right
 - 15 lights total
 - 5 lights form each arrowhead
 - 1st pulse: 1 far arrowhead
 - 2nd pulse: 2 far arrowheads
 - 3rd pulse: 3 arrowheads
 - 4th pulse: blank display
- Alternating diamonds
 - 16 lights total
 - 8 lights form each diamond
 - 1st pulse: 1 diamond shape on left
 - 2nd pulse: 1 diamond shape on right

4.5. Electronics

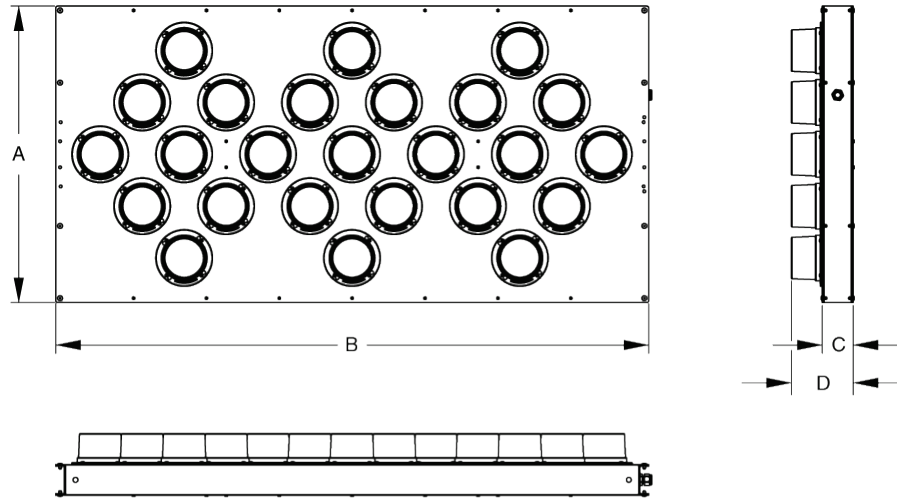
- 4.5.1. Location Inside control box
- 4.5.2. Temperature limits Operating temperature: -40 to 176°F (-40 to 80°C)
- 4.5.3. Flash rate 30 to 40 per minute, all display patterns
- 4.5.4. Positive drive circuit Positive power applied to lamps only when lit
 Negative is chassis grounded
- 4.5.5. Fuse protection Each driver is current-protected
- 4.5.6. Reverse-polarity protection Protects the controller if battery cables are connected backwards (which sometimes happens after servicing)
- 4.5.7. Low-voltage disconnect Low-voltage-disconnect circuit engages when battery voltage drops to 11.2Vdc, shutting down power to protect batteries from full discharge

5. POWER SUPPLY

- 5.1. Source Arrow board display, controller, and optional actuator are all powered by vehicle alternator system
- 5.2. Load Typical 8.4A @ 13.6Vdc
 Maximum Arrow board only: 5.0A @ 13.6Vdc
 Arrow board and optional power-operated tilt-frame: 20.0A @ 13.6Vdc
- 5.3. Voltage Minimum 11.0Vdc
 Maximum 18.0Vdc

6. DIMENSIONS & WEIGHT

6.1. Dimensions



*Dimensions in inches
(cm)*

Arrow board size	A	B	C	D
24 x 48	24 (60.9)	48 (121.9)	3 1/8 (7.9)	6 1/4 (15.8)
30 x 60	30 (76.2)	60 (152.4)	3 1/8 (7.9)	6 1/4 (15.8)
36 x 72	36 (91.4)	72 (182.8)	3 1/8 (7.9)	6 1/4 (15.8)
48 x 96	48 (121.9)	96 (243.8)	3 1/8 (7.9)	6 1/4 (15.8)

6.2. Weight

24 x 48 size	Approx. 42 lbs. (19kg)
30 x 60 size	Approx. 72 lbs. (33kg)
36 x 72 size	Approx. 100 lbs. (45kg)
48 x 96 size	Approx. 112 lbs. (51kg)

7. OPTIONS AND OPTIONAL EQUIPMENT

- 7.1. Cable length** Custom cable lengths are available for mounting control box; contact factory for details
- 7.2. PAR 46 lamps** Substitute PAR 46 LED lamps for standard lamps on 15-light 30 x 60 arrow board
- 7.3. Auto-dimming** A photocell detects ambient light; the controller adjusts the brightness of the LEDs accordingly, dimming display brightness in darkness, increasing to full brightness in daylight
Photocell is located on arrow board display-panel frame
- 7.4. Mounting options** A variety of standard mounting frames and brackets are available for installing the arrow boards. See below for details.
Custom options are also available; contact factory for details.

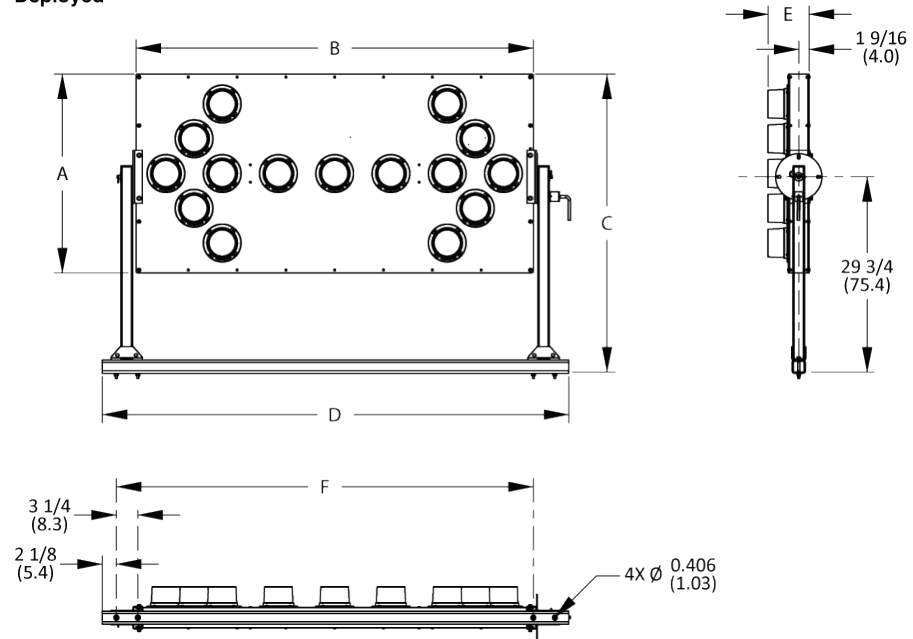
7.4.1. Manual-tilt (auto-lock) frame

Description Allows the arrow board to be tilted manually. A spring-loaded locking pin snaps into place automatically, locking the board in the vertical position (when deployed) or horizontal position (when not in use).

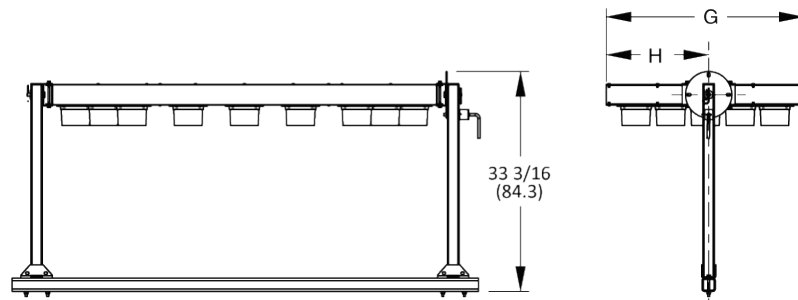
Base model WFB

Dimensions inches (cm)

Deployed



Travel position



Arrow board size	A	B	C	D	E	F	G	H
24 x 48	24 (60.9)	48 (121.9)	41 3/8 (104.9)	58 1/2 (148.6)	6 3/16 (15.8)	51 (129.5)	24 (60.9)	12 (30.5)
30 x 60	30 (76.2)	60 (152.4)	45 (114.3)	70 1/2 (179.1)	6 3/16 (15.8)	63 (160.0)	30 (76.2)	15 (38.1)
36 x 72	36 (91.4)	72 (182.8)	47 3/4 (121.1)	82 1/2 (209.6)	8 1/4 (21.0)	75 (190.5)	36 (91.4)	18 (45.7)
48 x 96	48 (121.9)	96 (243.8)	54 1/4 (136.7)	106 1/2 (270.5)	8 1/4 (21.0)	99 (251.5)	48 (121.9)	24 (60.9)

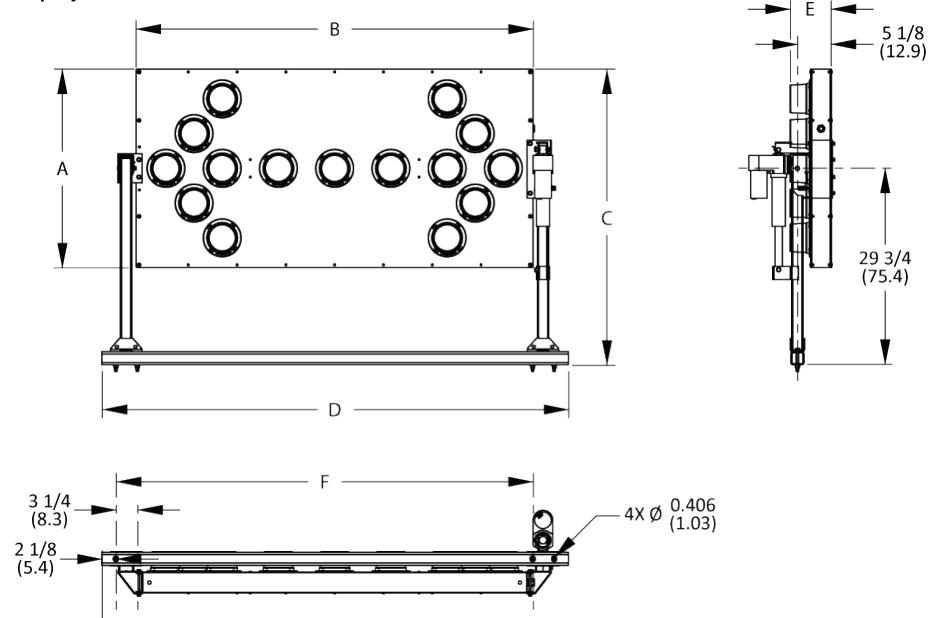
Weight Approx. 50 lbs. (22kg), frame only

7.4.2. 90 degree power-tilt frame Description Allows the arrow board to be tilted electrically. An electric actuator tilts the frame 90 degrees. The arrow board can be vertical (the deployed position) or horizontal (when not in use). The actuator is controlled with a toggle switch located inside the truck cab.

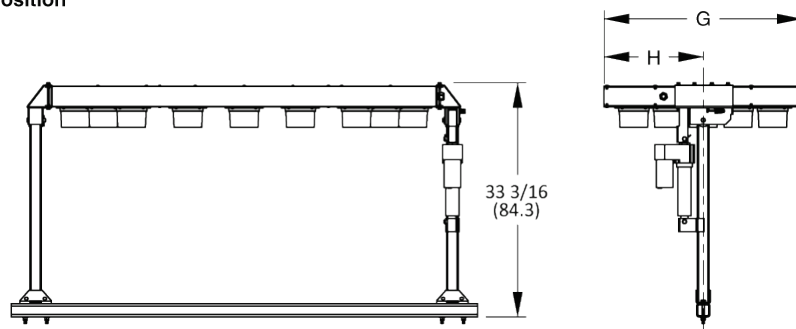
Base model WFBP

Dimensions inches (cm)

Deployed



Travel position



Arrow board size	A	B	C	D	E	F	G	H
24 x 48	24 (60.9)	48 (121.9)	41 1/2 (105.4)	58 1/2 (148.6)	6 3/16 (15.8)	51 (129.5)	24 (60.9)	12 (30.5)
30 x 60	30 (76.2)	60 (152.4)	44 3/4 (113.5)	70 1/2 (179.1)	6 3/16 (15.8)	63 (160.0)	30 (76.2)	15 (38.1)
36 x 72	36 (91.4)	72 (182.8)	47 3/4 (121.1)	82 1/2 (209.6)	8 1/4 (21.0)	75 (190.5)	36 (91.4)	18 (45.7)
48 x 96	48 (121.9)	96 (243.8)	53 7/8 (136.7)	106 1/2 (270.5)	8 1/4 (21.0)	99 (251.5)	48 (121.9)	24 (60.9)

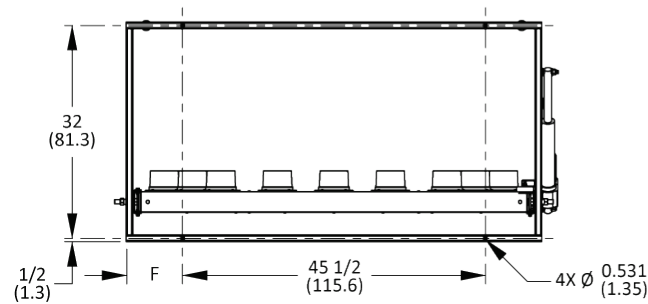
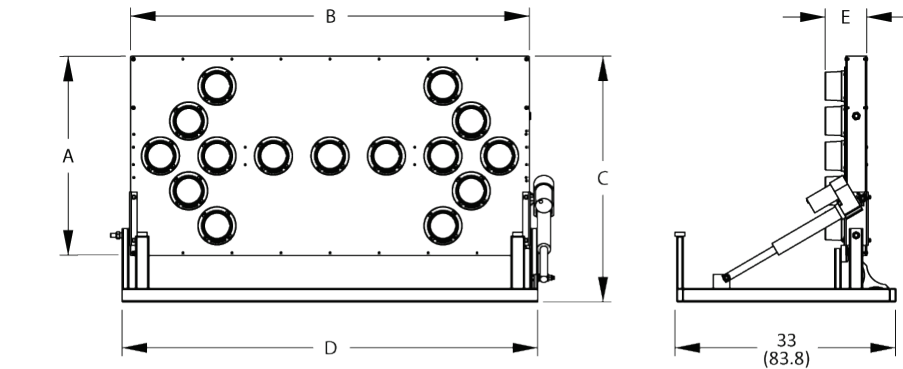
Weight Approx. 70 lbs. (32kg), frame only

7.4.3. 90 degree power-tilt low-profile frame Description Allows the arrow board to be tilted electrically. An electric actuator tilts the frame 90 degrees. The arrow board can be vertical (the deployed position) or horizontal (when not in use). In the horizontal position, the arrow board and frame has a low-profile height. The actuator is controlled with a toggle switch located inside the truck cab.

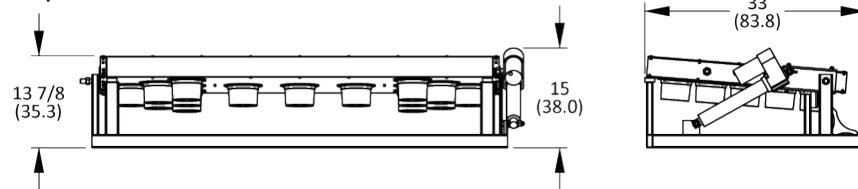
Base model WLP

Dimensions inches (cm)

Deployed



Travel position



Arrow board size	A	B	C	D	E	F
30 x 60	30 (76.2)	60 (152.4)	37 (94.0)	62 1/2 (158.8)	6 3/16 (15.8)	8 1/2 (21.6)
36 x 72	36 (91.4)	72 (182.8)	39 (99.1)	74 1/2 (189.2)	8 1/4 (21.0)	14 1/2 (36.8)

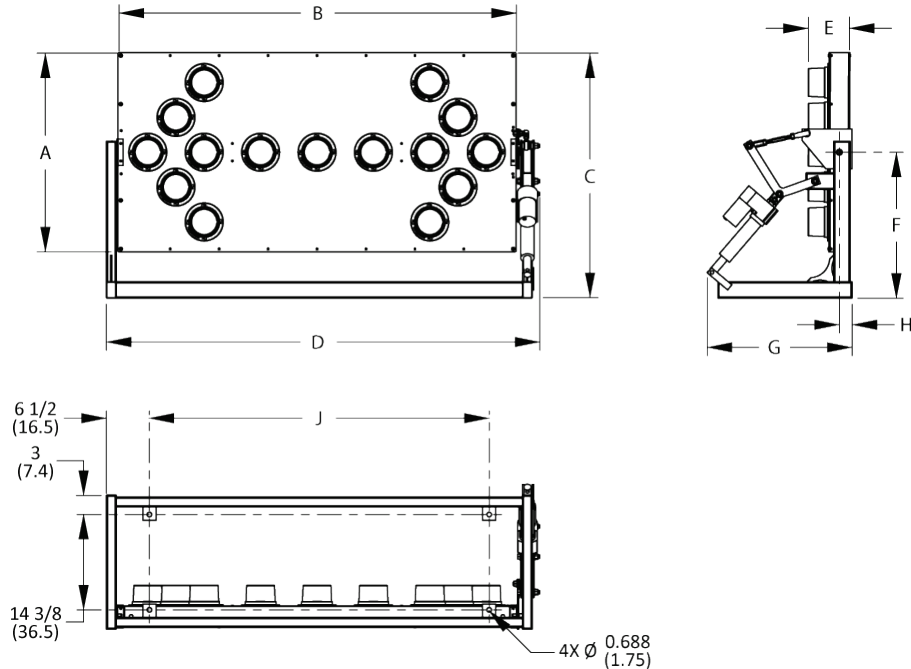
Weight Approx. 60 lbs. (27kg), frame only

7.4.4. 180 degree power-tilt frame
 Description Allows the arrow board to be tilted electrically. An electric actuator tilts the frame 180 degrees. The arrow board can face forward or backward when deployed) or downward (when not in use). The actuator is controlled with a toggle switch located inside the truck cab.

Base model WFP

Dimensions inches (cm)

Rear facing



Arrow board size	A	B	C	D	E	F	G	H	J
30 x 60	30 (76.2)	60 (152.4)	37 (94.0)	65 3/8 (166.0)	6 3/16 (15.8)	22 (55.9)	21 7/8 (55.4)	1 15/16 (4.9)	51 3/16 (130.0)
36 x 72	36 (91.4)	72 (182.8)	40 (101.6)	77 3/8 (196.4)	8 1/4 (21.0)	21 7/8 (55.6)	21 3/4 (55.2)	1 13/16 (4.6)	63 3/16 (160.5)

Weight Approx. 110 lbs. (50kg), frame only

7.4.5. Tailgate mounting brackets
 Allows the arrow board to be installed in a fixed position on a truck tailgate. The brackets clamp to the tailgate for permanent or temporary installation.

7.4.6. Truck-bed mounting brackets
 Allows the arrow board to be installed in a truck bed. Two brackets bolt to the bed and support either the 90-degree manual-tilt or 90-degree power-tilt frame.

EXHIBIT A: DISPLAY PATTERNS

5 FLASHING ARROW PATTERNS

Display size	Number of lights	No mounting	Manual tilt (auto-lock)	90° power-tilt	Low-profile 90° power-tilt	180° power-tilt	Tailgate mount
24 x 48	13	WB4-LA	WFB4-LA	WFBP4-LA	—	—	WVGB4-LA
30 x 60	15	WB5-LA	WFB5-LA	WFBP5-LA	WLP90B5-LA	WFP180B5-LA	WVGB5-LA
36 x 72	15	WB6-LA	WFB6-LA	WFBP6-LA	WLP90B6-LA	WFP180B6-LA	WVGB6-LA
48 x 96	15	WB8-LA	WFB8-LA	WFBP8-LA	—	—	WVGB8-LA

5 FLASHING & 2 SEQUENTIAL ARROW PATTERNS

Display size	Number of lights	No mounting	Manual tilt (auto-lock)	90° power-tilt	Low-profile 90° power-tilt	180° power-tilt	Tailgate mount
30 x 60	15	WB5-LSA	WFB5-LSA	WFBP5-LSA	WLP90B5-LSA	WFP180B5-LSA	WVGB5-LSA
36 x 72	15	WB6-LSA	WFB6-LSA	WFBP6-LSA	WLP90B6-LSA	WFP180B6-LSA	WVGB6-LSA
48 x 96	15	WB8-LSA	WFB8-LSA	WFBP8-LSA	—	—	WVGB8-LSA

5 FLASHING & 7 SEQUENTIAL ARROW PATTERNS

Display size	Number of lights	No mounting	Manual tilt (auto-lock)	90° power-tilt	Low-profile 90° power-tilt	180° power-tilt	Tailgate mount
30 x 60	25	WB5-LSAC	WFB5-LSAC	WFBP5-LSAC	WLP90B5-LSAC	WFP180B5-LSAC	WVGB5-LSAC
36 x 72	25	WB6-LSAC	WFB6-LSAC	WFBP6-LSAC	WLP90B6-LSAC	WFP180B6-LSAC	WVGB6-LSAC
48 x 96	25	WB8-LSAC	WFB8-LSAC	WFBP8-LSAC	—	—	WVGB8-LSAC

EXHIBIT B: DISPLAY PATTERNS

Flashing patterns

Pulse 1	Pulse 2	
		Flashing arrow, left or right
		Flashing double arrow
		Flashing four-corner warning
		Flashing caution-bar warning

Sequential patterns

Pulse 1	Pulse 2	Pulse 3	Pulse 4	
				Sequencing arrow, left or right
				Sequencing stem arrow, left or right*
				Sequencing chevron arrows, left or right*
				Alternating diamonds*

**Available only on 25-light arrow board models*