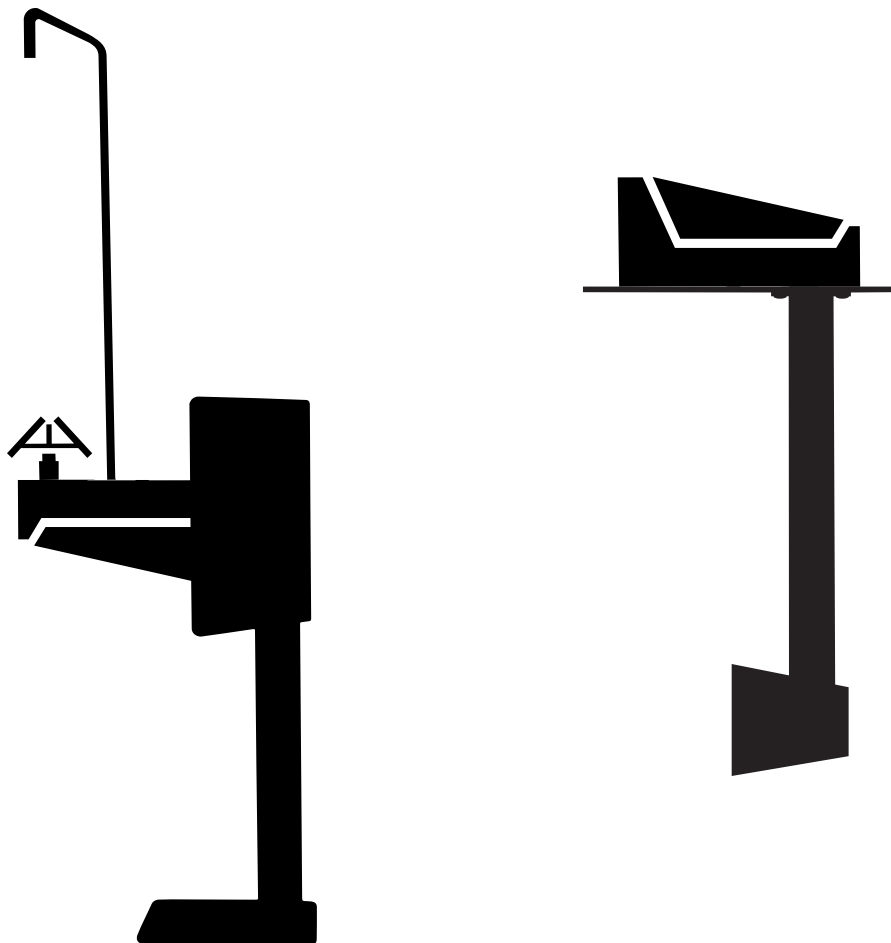
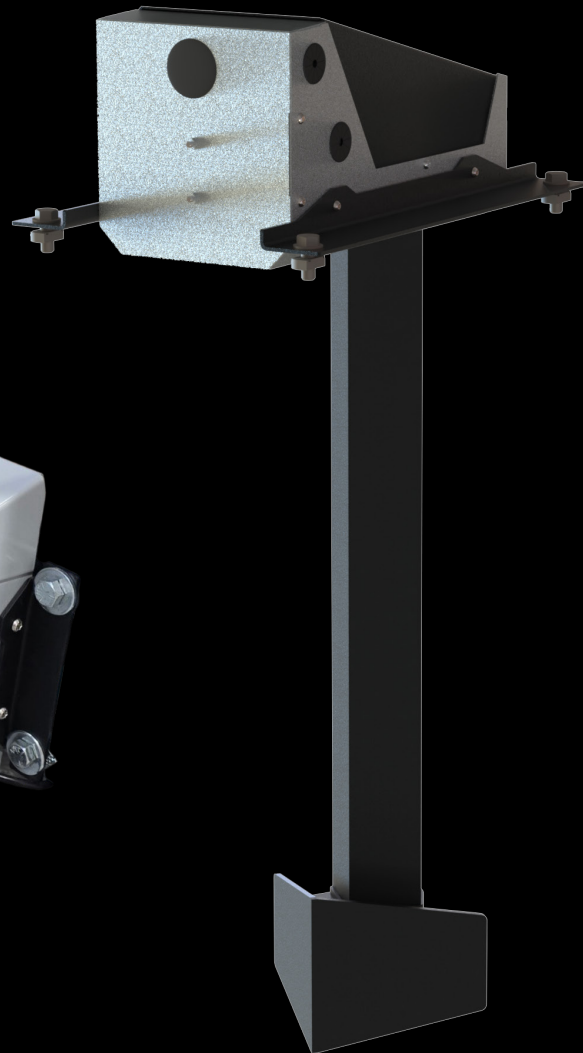


S U M M I T P E A K TM



spireOSTM

O P E R A T I O N S M A N U A L



1-800-761-1231

SUMMIT PEAK™

spireOS™

OPERATIONS MANUAL

Version 2.0 | Spire Ranges © 2026



Our customers are the heroes who make our world, countries, and communities safer. At Spire, we create exceptional shooting range systems that prepare them for when duty calls.

OUR MISSION?

**EVERY HERO COMES
HOME SAFE.**



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SUMMIT PEAK INTRODUCTION

The first of our Summit series, the PEAK is a turning target system that is ideal for any range's customized training programs and courses of fire. Electric-powered actuators quickly and quietly turn targets 90, 180 and 360° with random edging and friend/foe presentation. Targets can be controlled individually or synchronized with a Spire master control touch screen and/or wireless remote. With optional lighting, the target system is ready to go with any training scenario.

The PEAK is a Precision Electric Actuator Kit that is ready for any deployment. The PEAK-360i is the ceiling-mounted, 360 degree turner. The PEAK-360 is the ground-mounted, 360 degree turner that is ready to mount directly to the ground without the need of a kneewall or directly to the back of a kneewall to save on costs. The PEAK and PEAK-i are the non-turning versions of the PEAK lineup for those not in need of electric turning capabilities.

The PEAK system is proven durable, making it an ideal target system for all types of facilities and organizations, including law enforcement, military, government, commercial, and indoor/outdoor ranges.

MASTER CONTROL CONSOLE OVERVIEW

The Master Control Console allows a range master to manually control drills for an individual position or for all of the positions simultaneously on the range. As an option, a phone app allows for the rangemaster to control the system from the firing line. Additionally, an optional wireless remote allows for the range master to control the system from the firing line.

IMPORTANT SAFETY INFORMATION



Maintenance and use must adhere to the guidelines in this manual. Improper use of any of the equipment can result in poor performance, product damage and even serious physical injury. Properly trained personnel should only operate the equipment within the range. For technical, mechanical and electrical maintenance, it is recommended that a trained professional be consulted. Protective headwear, eyewear and gloves should always be worn when performing any maintenance. Danger risks include, but are not limited to, electric shock, head injuries, limb or body crushing, poking/pinching of extremities and eye trauma.

Operators should take care when operating clamps and be aware of location of any sharp locations. Spire is not liable for any injuries sustained while operating the clamps.

WARRANTY OF EQUIPMENT

Refer to agreement documents for specific warranty details for your range. All Spire Ranges equipment is warranted against defects in materials or workmanship under normal use and service, with coverage periods varying by equipment type and range agreement. Warranty periods begin upon equipment handoff and completion of customer training and apply only to the original installation and purchaser.

Coverage excludes consumable items, normal wear and tear, misuse or abuse, improper maintenance, unauthorized modifications, non-approved materials, and damages caused by external factors, third-party systems, or alterations/repairs made by anyone who is not pre-authorized in writing by Spire Ranges to modify, alter, repair, or otherwise handle in any way the product. Damage resulting from the use of armor-piercing (AP) or tracer ammunition or calibers not approved for your range's ballistic rating, as well as excessive wear from high-velocity rounds exceeding 3000 fps, is not covered.

Spire Ranges reserves the right to determine if any part is defective and to repair or replace parts as it elects. This warranty does not cover shipping costs of defective parts from the owner's site. Customers are responsible for proper maintenance, maintaining service records, and timely reporting of issues. Return shipping to the site is covered by Spire Ranges during the warranty period. Warranty service is subject to compliance with required procedures, including remote troubleshooting prior to any authorized onsite service. This warranty covers on site labor, travel expenses and accommodations if applicable.

Damage of Spire Ranges equipment resulting in utilizing armor piercing (AP) ammunition or tracer rounds will not be covered under warranty. In addition, high velocity rounds (both ball and frangible) traveling at speeds more than 3000 fps may result in wear, dimpling and pocking of the 1/4" AR500 ballistic shields and target clamps depending on the angle of impact. Such wear, dimpling, and pocking under these conditions is not covered under warranty.

Spire Ranges provides lifetime phone and email support for troubleshooting and operational guidance. Extended warranties and service agreements are available separately.

BALLISTIC RATINGS

Ammunition specs listed below are examples of energy and velocity only. Note, any use of Armor Piercing (AP), Steel Core, or Tracer Rounds will void the warranty.

PLATE RATING	MUNITIONS TYPE	MAX ENERGY	MAX VELOCITY
1/4" AR500	Pistol	1175 ft-lbs	1485 fps
3/8" AR500	Pistol/Rifle	3600 ft-lbs	3300 fps

TYP. AMMO	BULLET WEIGHT	MAX ENERGY	MAX VELOCITY
.22 LR	40 gr HP	140 ft-lbs	1400 fps
9MM LUGER	124 gr FMJ	460 ft-lbs	1293 fps
.357 MAG	158 gr JSP	663 ft-lbs	1375 fps
.44 MAG	240 gr SWC	1175 ft-lbs	1485 fps
5.56X45MM NATO	55 gr FMJ	1402 ft-lbs	3388 fps
7.62X51MM NATO	150 gr FMJ	3048 ft-lbs	3025 fps
.308 WIN	150 gr SPTZ	2800 ft-lbs	2900 fps
30-06	180 gr SPTZ	3360 ft-lbs	2900 fps
300 WM	190 gr BTHP	3548 ft-lbs	2900 fps

Spire Ranges products can handle .50 BMG in moderation; however, due to the large amounts of energy exerted from the round, the following applies:

Repeatedly using .50 BMG will shorten the life expectancy of the product and may void warranty.

Repeated impacts of .50 BMG fired in the same location of the product can cause damage in as few as 50 rounds.

Any armor piercing (AP) rounds, particularly those from .50 BMG will void any warranty.

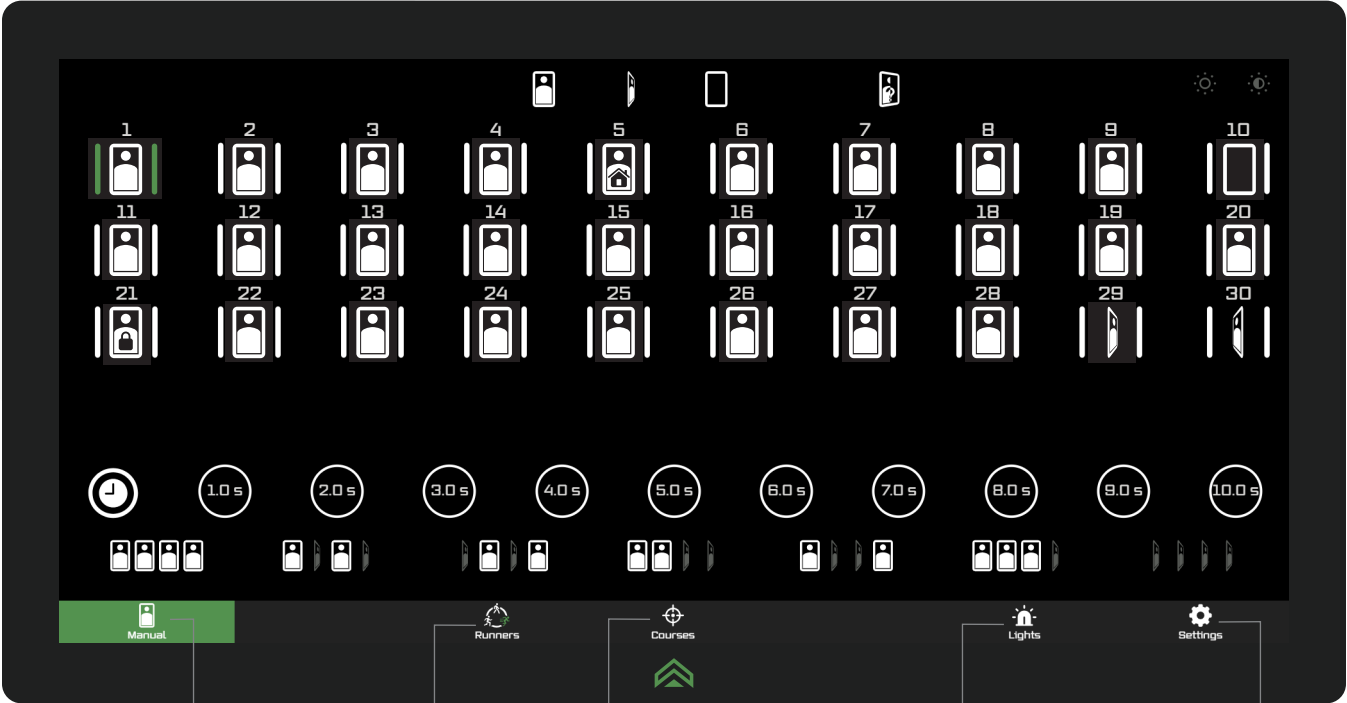
LIMITATION OF LIABILITY

Neither Spire Ranges, nor any company affiliated with it, makes any warranties, representations or promise as to the performance or quality of the product other than what is specified in the original agreement between Spire Ranges and the range Owner. The liability of Spire Ranges to the Owner for damages arising out of the manufacture, sale, delivery, use or resale of this product shall be limited to and shall not exceed the cost of repair or replacement of defective parts. Spire Ranges shall not be liable for loss of use, inconvenience or any other incidental, indirect or consequential damages.

No representative of Spire Ranges has the authority to make any representation or promise on behalf of Spire Ranges or to alter or modify the terms or limitations of warranties in any way.

MASTER CONTROLS:

NAVIGATION



Manual Operation Screen
p. 17

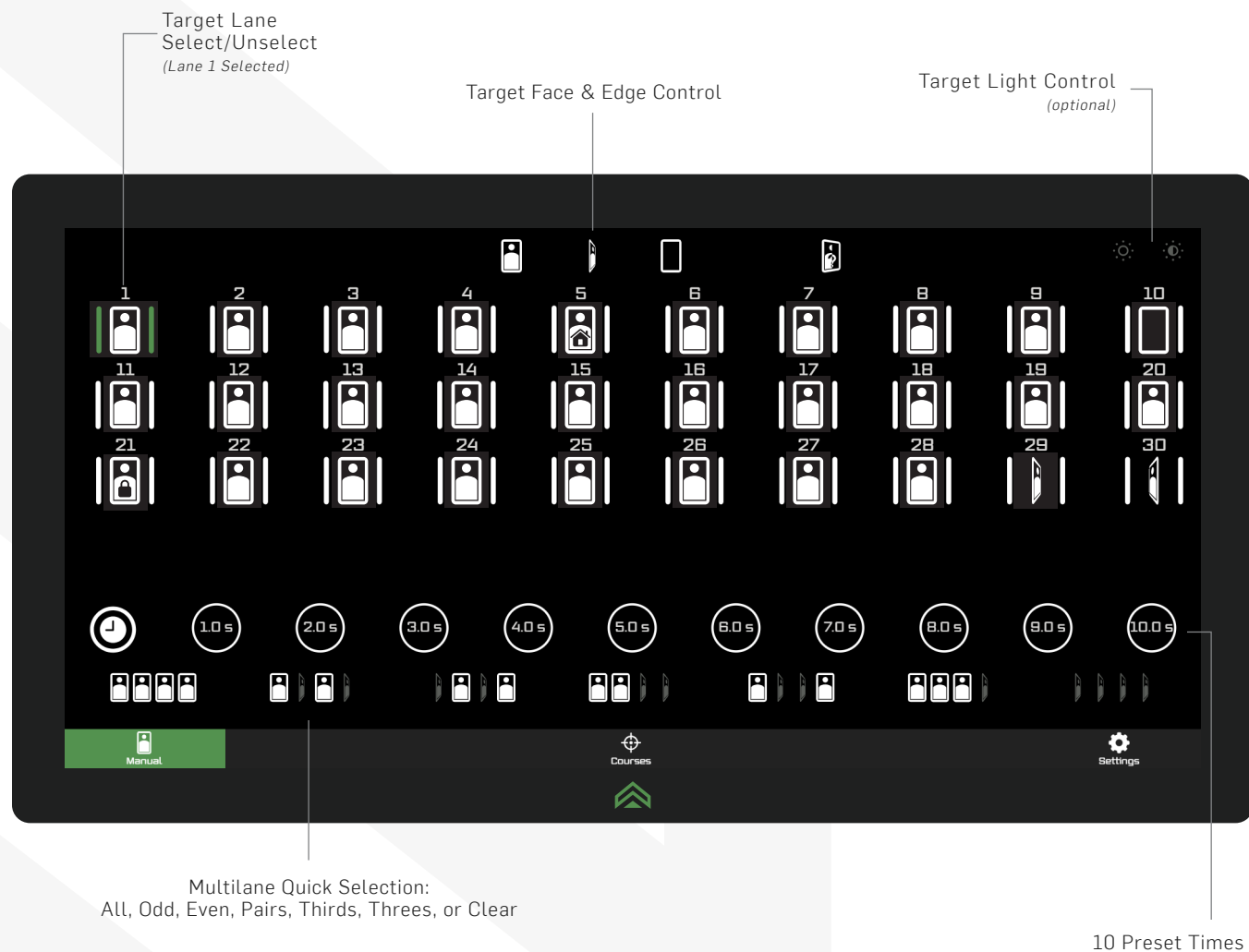
Running Man Operation
(optional)

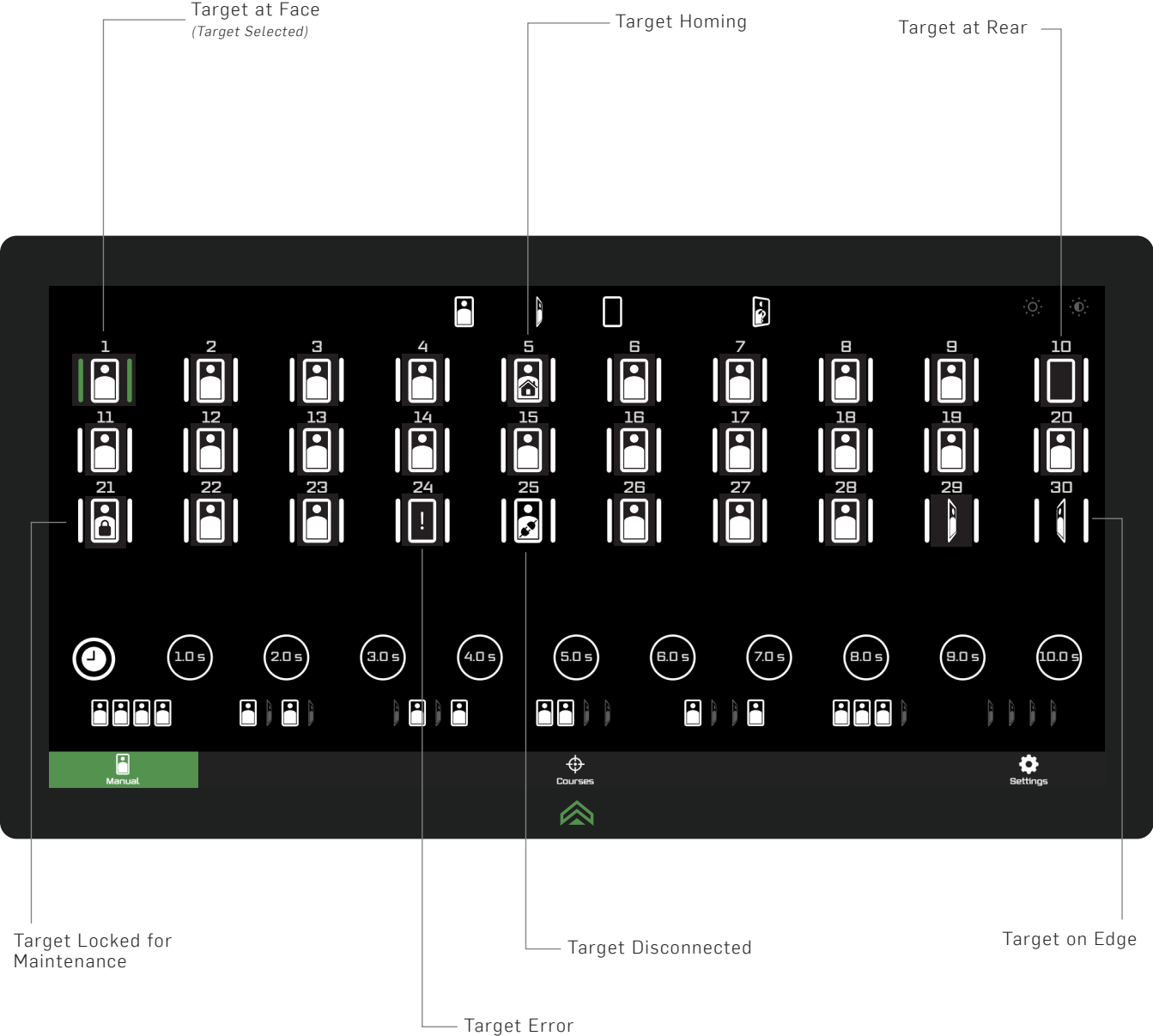
Courses of Fire Menu
p. 25

Yard Line Lights *(optional)*
p. 19

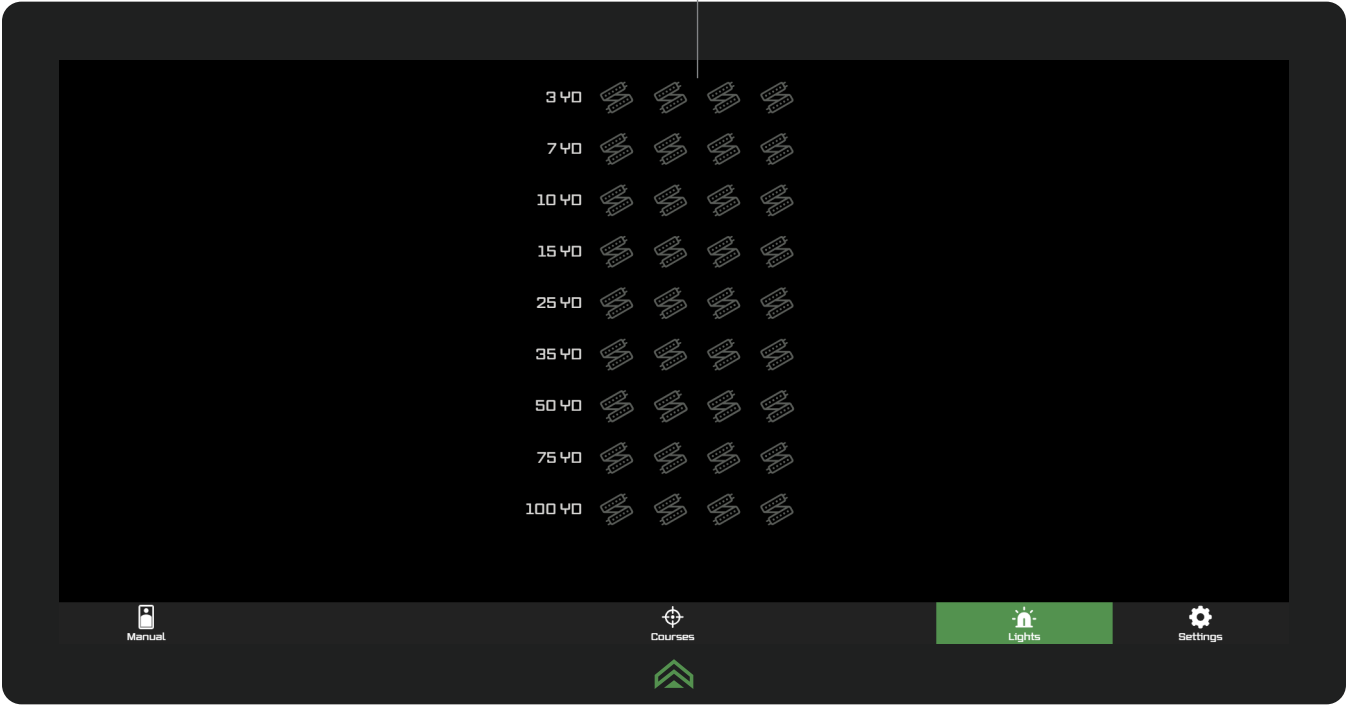
Settings
p. 27

MANUAL SESSION





Red/Green/Blue/White
Yard Light Control

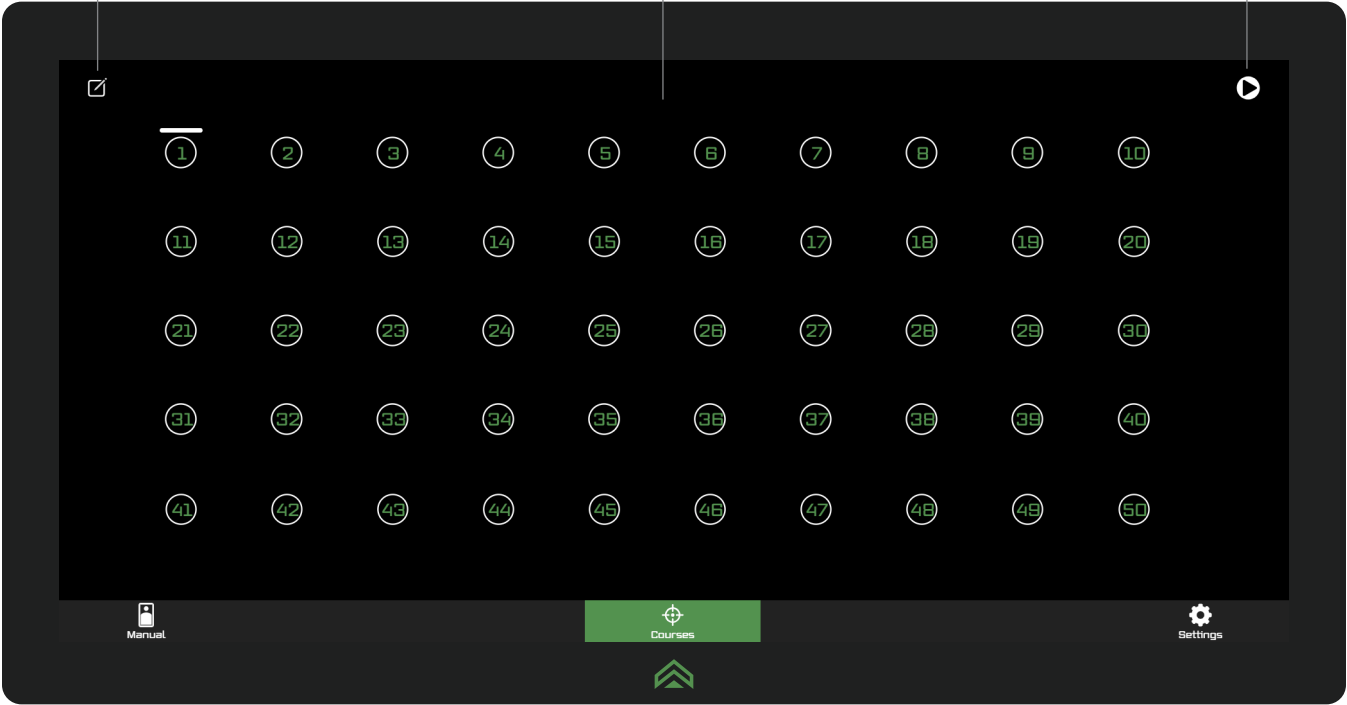


COURSE OF FIRE

Edit Selected Course
p. 23

50 Courses of Fire
Push to Select
(Course 1 Selected)

Run Selected Course
p. 25



Return to Course
Select Screen
p. 22

Pages of Additional
Stages

Yard light control
(optional)

Save course
edits

of stages

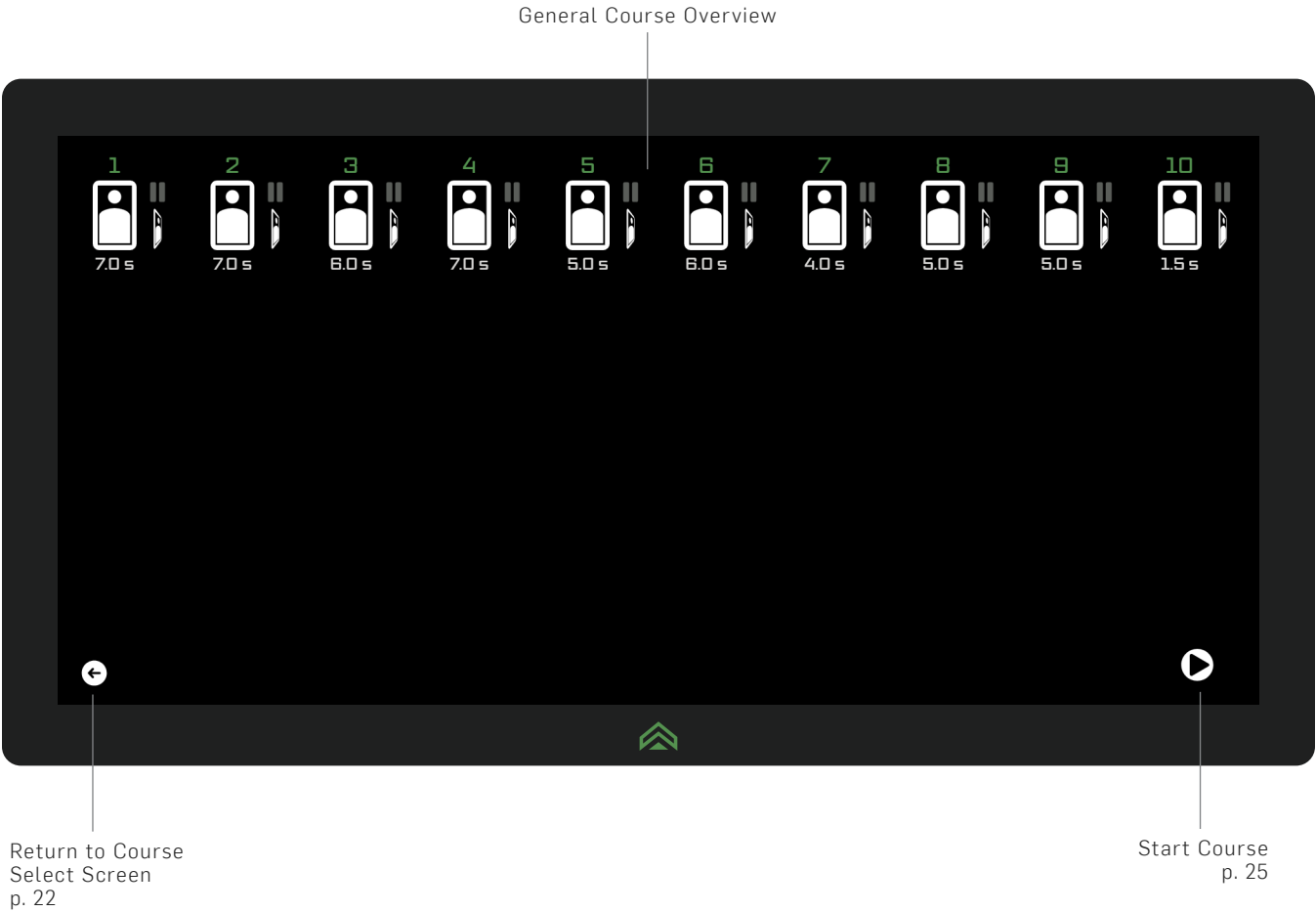
Duration of
timed angle

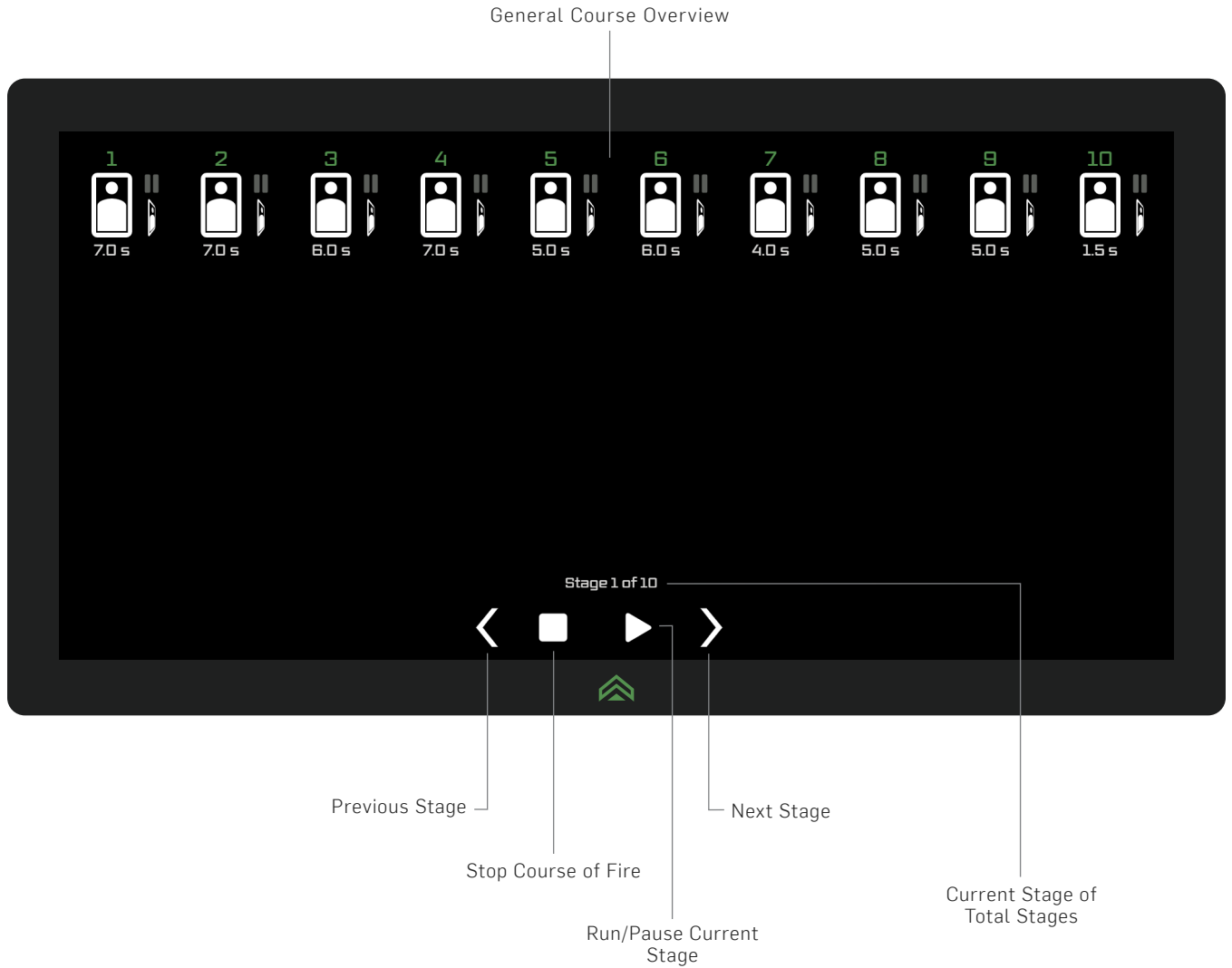


End stage on edge

Wait for "Start" button
between stages

Main target angle. Will
turn to this position and
remain for timer duration



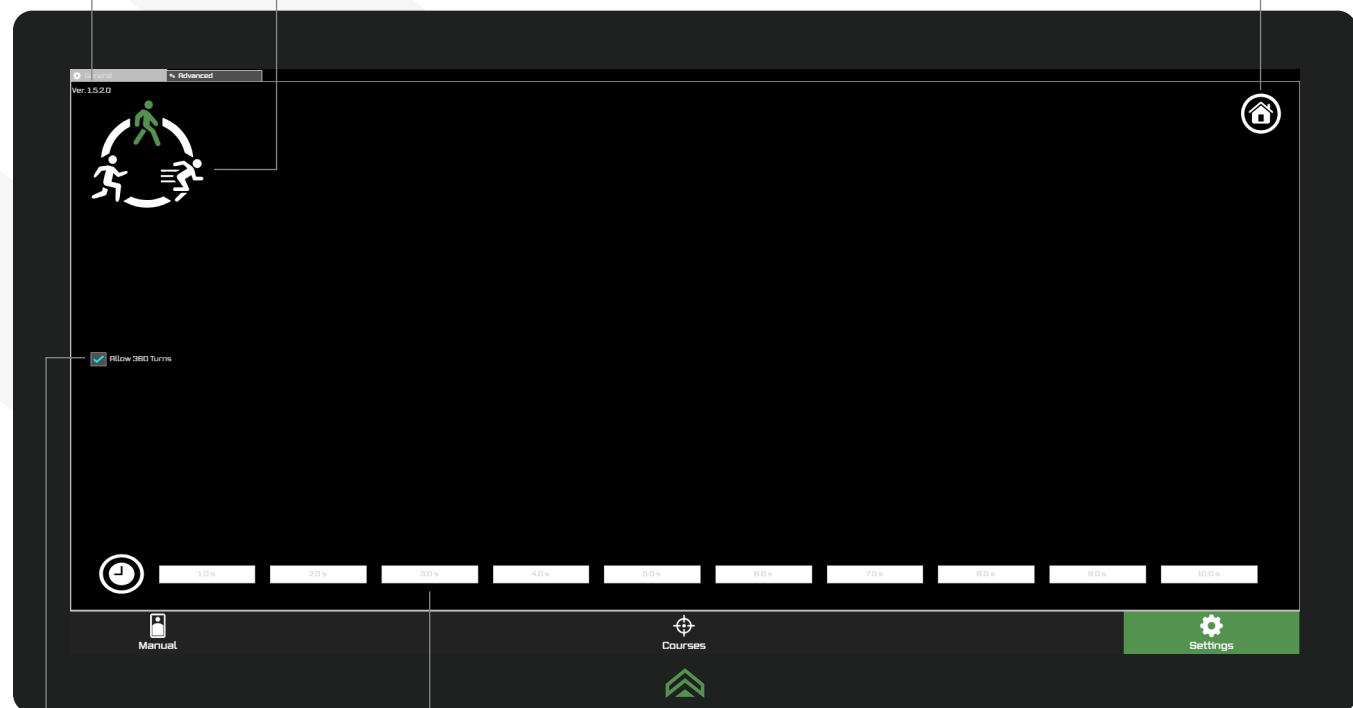


PEAK CONFIGURATION

SpireOS Version

Turning Speed
Walk/Jog/Run

Home Selected
Targets



Allow/Disallow a full
360 degree turn

Face Time Presets
(seconds)

OPTIONAL MOBILE CONTROLS:

- [1] Connect to the range WiFi.
 - WiFi: RangeAccess
 - Password: spireranges
- [2] Open a web browser.
- [3] Type spireos.home.arpa into the browser search bar and press enter.
 - If that doesn't work, try 192.168.1.20
- [4] The Operations Screen should load if everything is working correctly.

PEAK COMPONENTS:

PARTS LIST

CODE	DESCRIPTION	PRT #
1	DOUBLE SIDED TAPE	DST-1000G-030
2	RED TACTICAL LED LIGHT - RAISED	ELE-1007-001
3	WHITE TACTICAL LED LIGHT - RAISED	ELE-1007-002
4	BLUE TACTICAL LED LIGHT - RAISED	ELE-1007-003
5	WIRE TIE MOUNT	ELE-1010-WTM
6	5A DIN RAIL RELAY	ELE-2022-010
7	2 POLE CIRCUIT BREAKER 3 AMP	ELE-2022-030
8	35MM DIN RAIL	ELE-3001
9	SCREWLESS END STOP	ELE-3012-101-WG
10	5/8" PANEL PLUG - PLASTIC	ELE-4001-063
11	2" LOCKING PANEL PLUGS	ELE-4001-200
12	48V DC TO 24V DC REDUCER 1A	ELE-48-24-1A
13	WAGO MOUNTING CARRIER	ELE-5002-CAR
14	WAGO INLINE 12GA MAX SPLICING CONNECTOR	ELE-5002-CLIP
15	CLAMP-ON WIRE SPLICING CONNECTORS	ELE-5002-CLIP-3
16	CLAMP-ON WIRE SPLICING CONNECTORS	ELE-5002-CLIP-5
17	48 VDC 2.5A POWER SUPPLY - 120W	ELE-6002-120-48
18	24VDC 2.5A POWER SUPPLY - 60W	ELE-6024-060

** Indicates recommended replacement parts. (See p. 82 for more information)

*** Indicated parts that are consumables and are not covered under the warranty agreement. In addition, any misuse, lack of maintenance, and/or modifications made to any Spire products will void all warranties.

CODE	DESCRIPTION	PRT #
19	M12 4 PIN RIGHT ANGLE CABLE - 1 METERS LENGTH	ELE-P4M12-01M-R
20	BULKHEAD CONNECTOR	ELE-P5M12-B5P
21	CUBE HOMING PROX SENSOR	EPX-NBN40-PF
22	***1/2" 2-BOLT PRESSED FLANGE BEARING	HBR-SFL205-008
23	M3.5 X 10MM BUTTON HEAD TORX SCREW	HBT-M3.5X10-SS
24	M5 X 16MM TAMPER RESISTANT BUTTON HEAD TORX SCREW	HBT-M5X16-TR-SS
25	M6X10 BUTTON HEAD TORX SCREW - STAINLESS**	HBT-M6X10-SS
26	M6 X 12MM TAMPER RESISTANT BUTTON HEAD TORX SCREW**	HBT-M6X12-TR-SS
27	M6 X 16MM TAMPER RESISTANT BUTTON HEAD TORX SCREW	HBT-M6X16-TR-SS
28	M6 X 20MM TAMPER RESISTANT BUTTON HEAD TORX SCREW	HBT-M6X20-TR-SS
29	M6 X 25MM TORX BUTTON HEAD SCREW - STAINLESS STEEL	HBT-M6X25-SS
30	M6 X 16MM CARRIAGE BOLT - STAINLESS	HCB-M6X16-SS
31	PEAK HOUSING LID	HET-063-406
32	1/2" X 3/4" X 1/2" FLANGE BUSHING-BZ	HFB-500750-500
33	1/2"-13 X 1-1/4" HEX HEAD BOLT - ZINC	HHB-50013-125-ZN
34	1-3/8" HOLE X 1/8" FLEX-GRIP LOCKING GROMMET	HLG-1375-013
35	M6 LOW PROFILE NYLON LOCK NUT	HLN-M6-001-ZN
36	5MM X 8MM UNDERSIZED MACHINE KEY - STAINLESS**	HMK-5MMUB-8MM-SS
37	14MM SHAFT EXTERNAL RETAINING RING	HSR-14MM-EXT
38	OFF-WHITE NYLON UNTHREADED SPACER	HSW-250500-500-NY

CODE	DESCRIPTION	PRT #
39	.500 ID X 1.060 OD X .070 FLAT WASHER - ZINC	HWS-5001060-070-ZN
40	M6 WAVE SPRING LOCK WASHER**	HWS-M6-WV
41	PEAK HOUSING LID - POWDER COATED	TGP-130-004-PC
42	PEAK HEAT SHIELD - POWDER COATED	TGP-130-006-PC
43	PEAK LIGHT MOUNT BRACKET - SWS - POWDER COATED	TGP-130-007-PC
44	CLAMP HOMING SHAFT	TGP-200-001
45	CLAMP HOMING SHAFT - PEAK GROUND	TGP-200-002
46	CLAMP HOMING SHAFT - PEAK STICK	TGP-200-003
47	CLAMP MOTOR SPACER PLATE	TGP-210-001
48	TURNING MOTOR HOMING SENSOR BRACKET	TGP-210-002
49	MOTOR SENSOR LOCKING PLATE	TGP-210-003
50	CLAMP MOTOR GASKET	TGP-210-004
51	HOMING ARM BLOCK PLATE	TGP-210-005
52	TARGETRY CLAMP EXTENSION SPACER PLATE**	TGP-300-003
53	DOWNRIGGER EXTENSION SHAFT	TGP-310-006
54	PEAK INVERTED MOUNTING BRACKET - POWDER COATED	TGP-900-001-PC
55	PEAK SIDE MOUNTING BRACKET - POWDER COATED	TGP-900-002-PC
56	1/2"-13 CHANNEL STRUT NUT - ZINC	USN-50013-001-ZN

** Indicates recommended replacement parts. (See p. 82 for more information)

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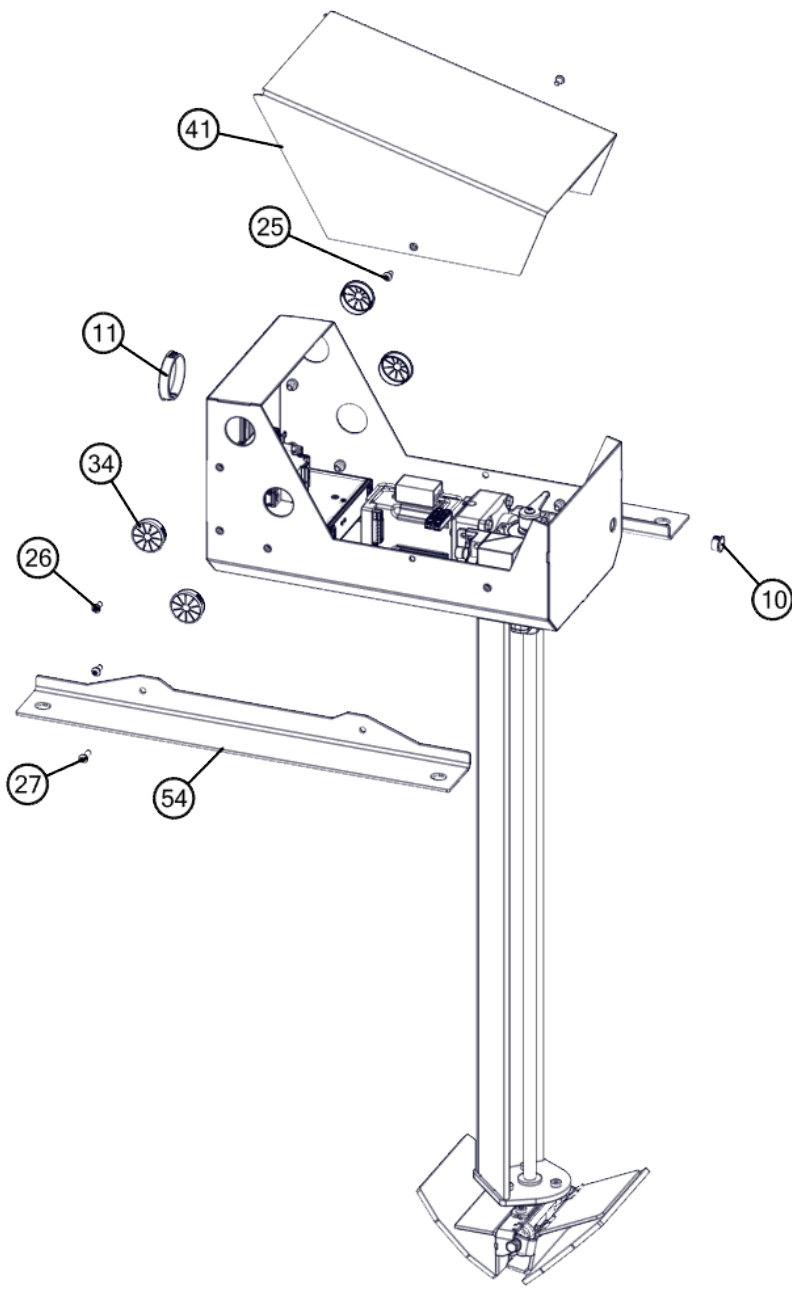
CODE	DESCRIPTION	PRT #
57	TARGETRY TURNING MOTOR AND GEAR BOX - STANDARD**	MTR-TRN-STND
58	PEAK HOUSING WELDMENT - POWDER COATED	TGW-130-001-PC
59	TARGETRY CLAMP HOMING TAB WELDMENT - POWDER COATED	TGW-300-001-PC
60	SHAFT EXTENSION MOUNT BRACKET WELDMENT - POWDER COATED	TGW-300-002-PC
61	TARGETRY CLAMP MOUNT WELDMENT - POWDER COATED	TGW-300-003-PC
62	CLAMP EXTENSION MOUNTING BRACKET WELDMENT - POWDER COATED	TGW-300-004-PC
63	***RIGGER 28-1/4" EXTENSION WELDMENT	TGW-311-100-PC
64	***RIGGER STICK EXTENSION WELDMENT - POWDER COATED	TGW-311-120-PC
65	***RIGGER 5" EXTENSION WELDMENT - POWDER COATED	TGW-311-130-PC
66	***RIGGER CLAMP DEFLECTOR WELDMENT - POWDER COATED	TGW-311-200-PC
67	***EXPOSED CLAMP ASSEMBLY**	TGA-300-CLMP-EX
67.1	.250 X .562 X .060 INSUL WASHER-NY	HIW-250562-060-NY
67.2	1/4"-20 X 6" HEX HEAD BOLT - ZINC	HHB-25020-600-ZN
67.3	1/4"-20 THIN NYLOCK NUT - ZINC	HLN-25020-001-ZN
67.4	.453 ID X .095 WD X 3.00 LEFT HANDED 90 DEGREE TORSION SPRING	HSP-453T90-300-L
67.5	.453 ID X .095 WD X 3.00 RIGHT HANDED 90 DEGREE TORSION SPRING	HSP-453T90-300-R
67.6	EXPOSED CLAMP FIXED JAW WELDMENT - POWDER COATED	TGW-320-002-PC
67.7	EXPOSED CLAMP FLOATED JAW WELDMENT - POWDER COATED	TGW-320-003-PC
68	***HIDDEN CLAMP ASSEMBLY**	TGA-300-CLMP-HD
68.1	1/4"-20 X 6" HEX HEAD BOLT - ZINC	HHB-25020-600-ZN

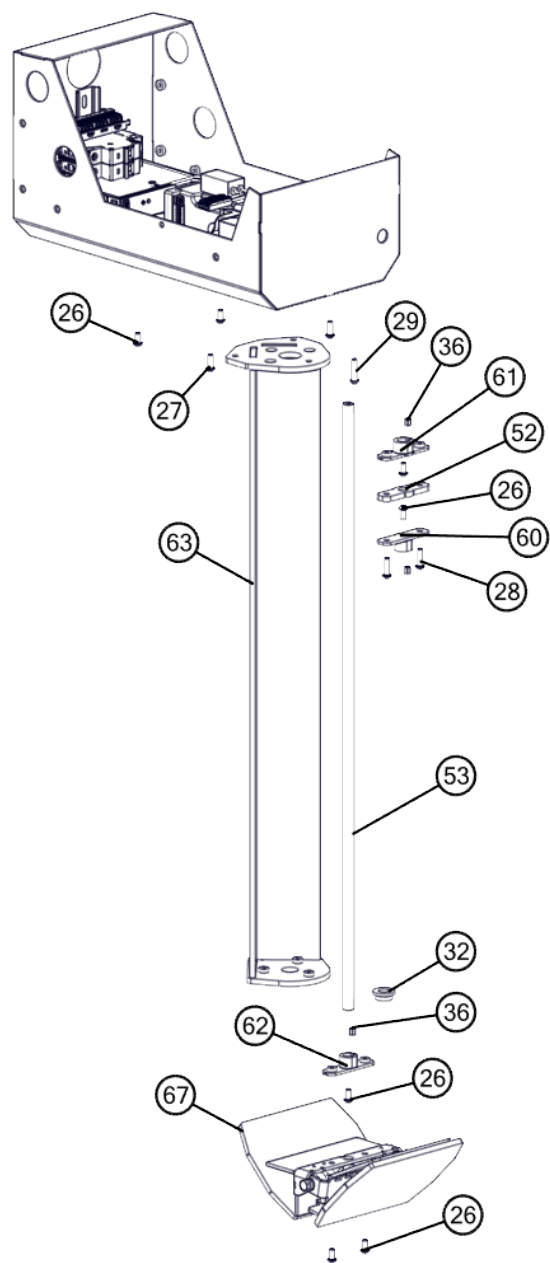
CODE	DESCRIPTION	PRT #
68.2	.250 X .562 X .060 INSUL WASHER-NY	HIW-250562-060-NY
68.3	1/4"-20 THIN NYLOCK NUT - ZINC	HLN-25020-001-ZN
68.4	.453 ID X .095 WD X 3.00 LEFT HANDED 90 DEGREE TORSION SPRING	HSP-453T90-300-L
68.5	.453 ID X .095 WD X 3.00 RIGHT HANDED 90 DEGREE TORSION SPRING	HSP-453T90-300-R
68.6	HIDDEN CLAMP FLOATING JAW - POWDER COATED	TGP-320-003-PC
68.7	GEN2 CLAMP WELDMENT - POWDER COATED	TGW-320-001-PC
69	***STICK CLAMP ASSEMBLY**	TGA-300-CLMP-STX
69.1	ZINC-PLATED STEEL RING-GRIP QUICK-RELEASE PIN	HRP-025-250
69.2	1/4"-20 X 3/4" SPADE THUMB SCREW - ZINC	HST-25020-075-ZN
69.3	STICK TURNER BRACKET - POWDER COATED	TGP-330-001-PC
69.4	STICK TURNER CLAMP TUBE - POWDER COATED	TGP-330-005-PC

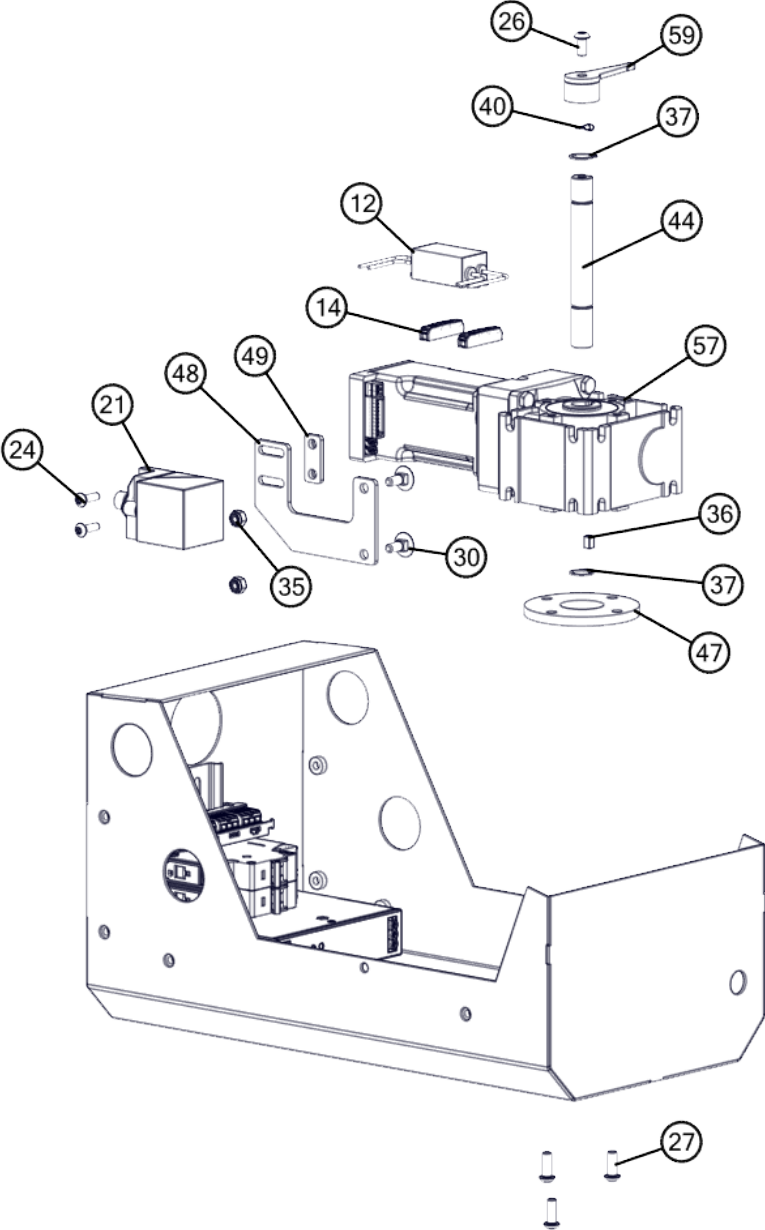
** Indicates recommended replacement parts. (See p. 82 for more information)

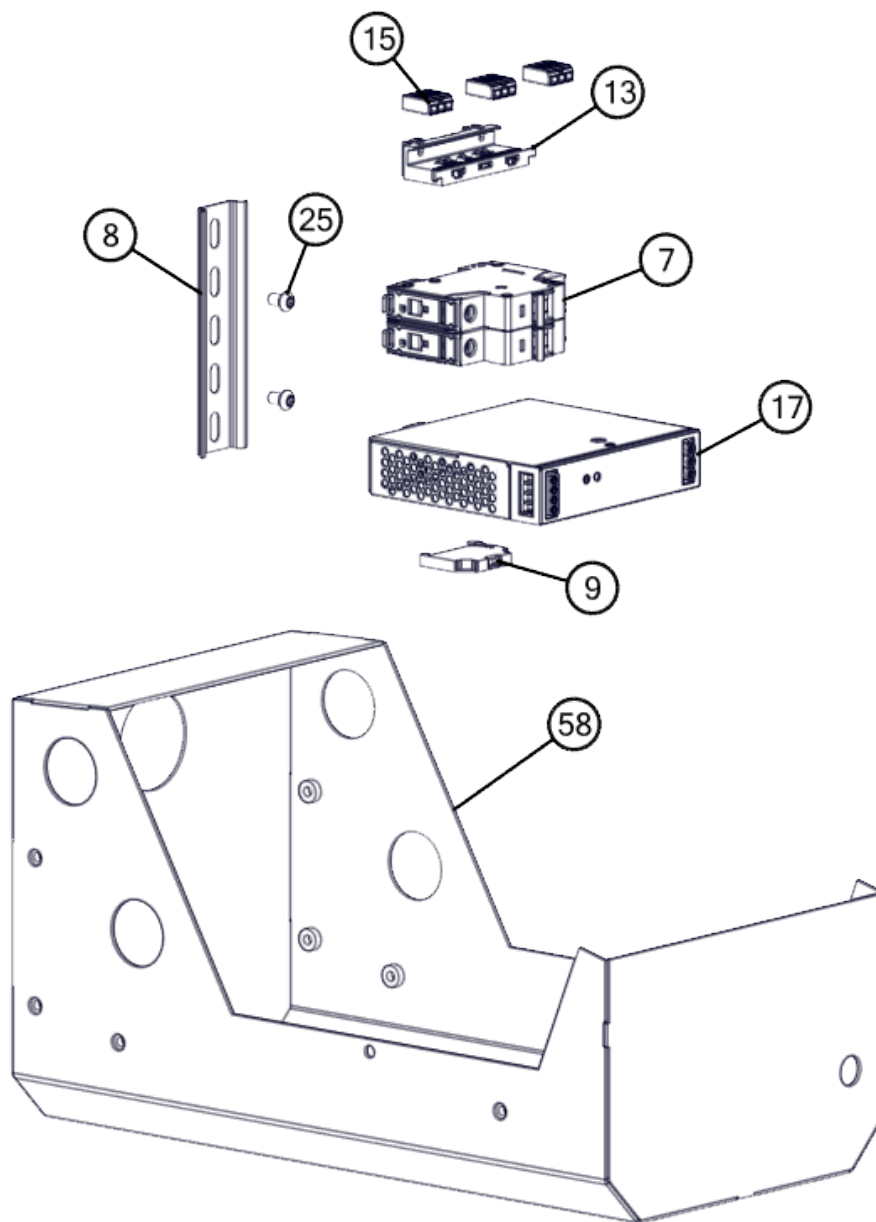
*** Indicated parts that are consumables and are not covered under the warranty agreement. In addition, any misuse, lack of maintenance, and/or modifications made to any Spire products will void all warranties.

PEAK-3601 (EXPOSED CLAMP)

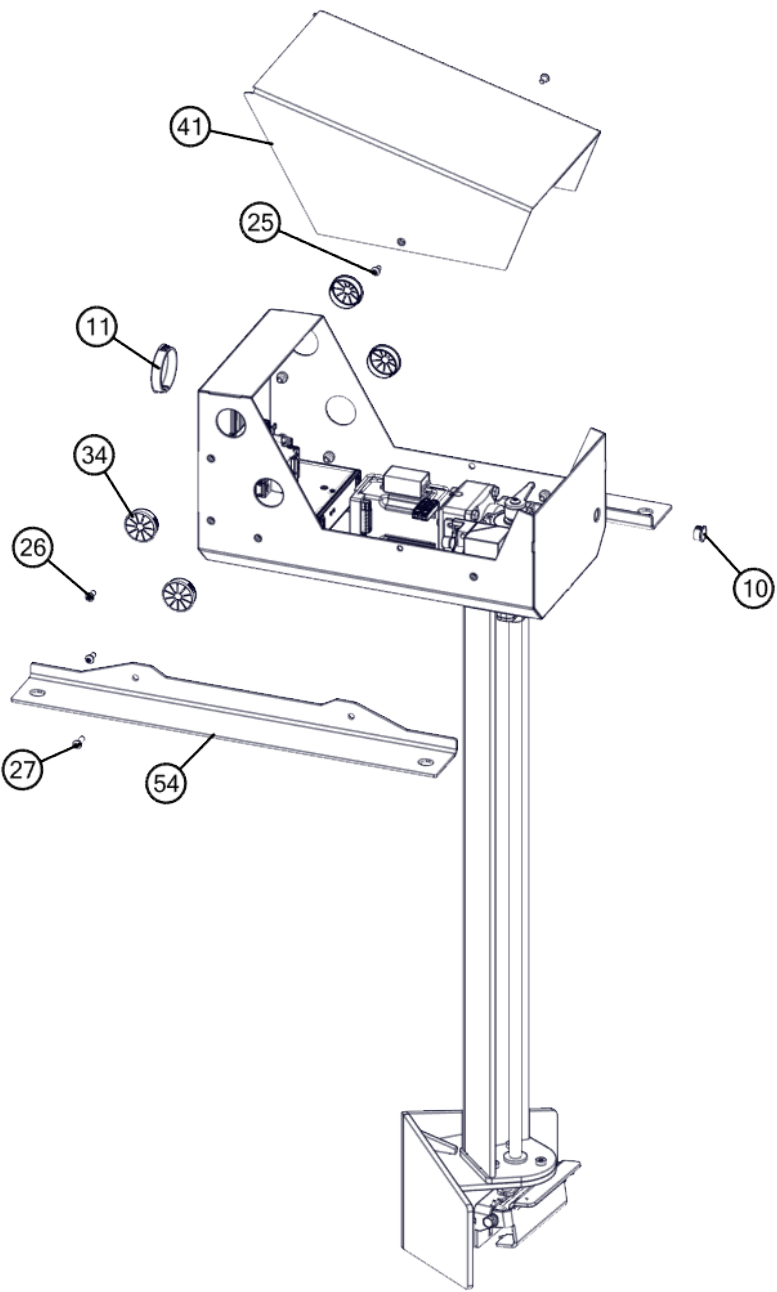


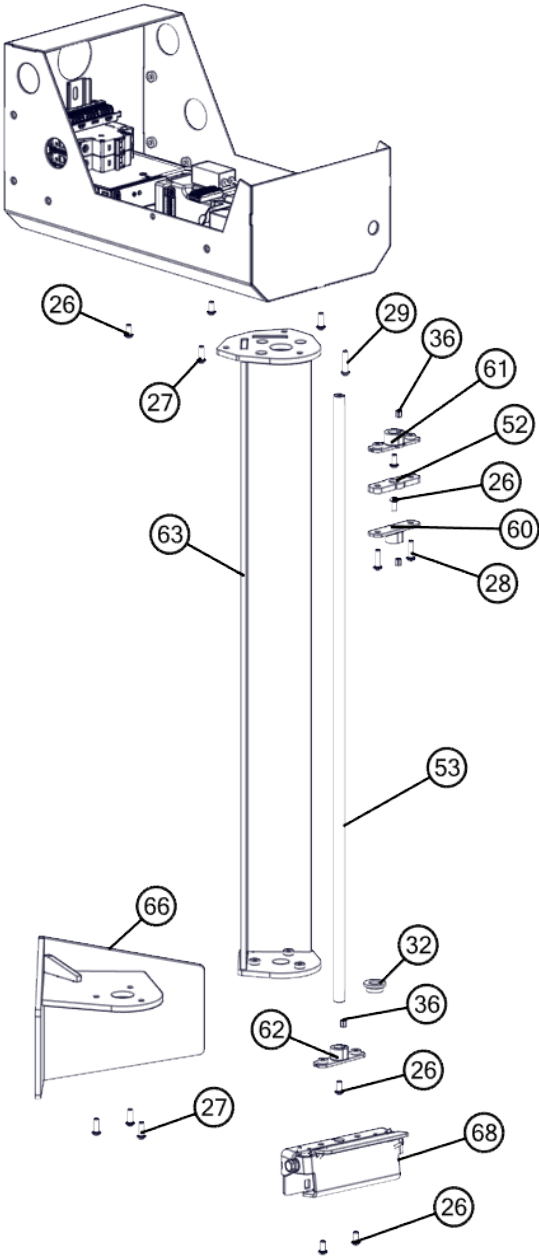


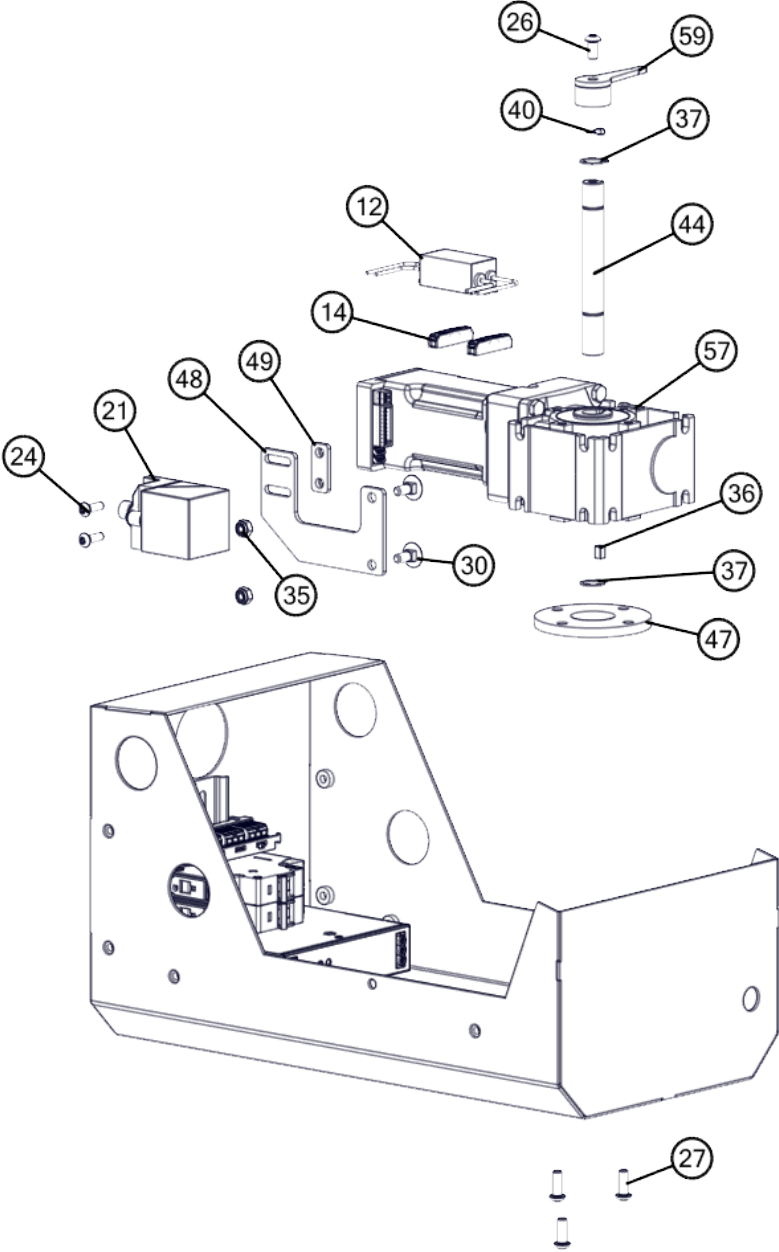


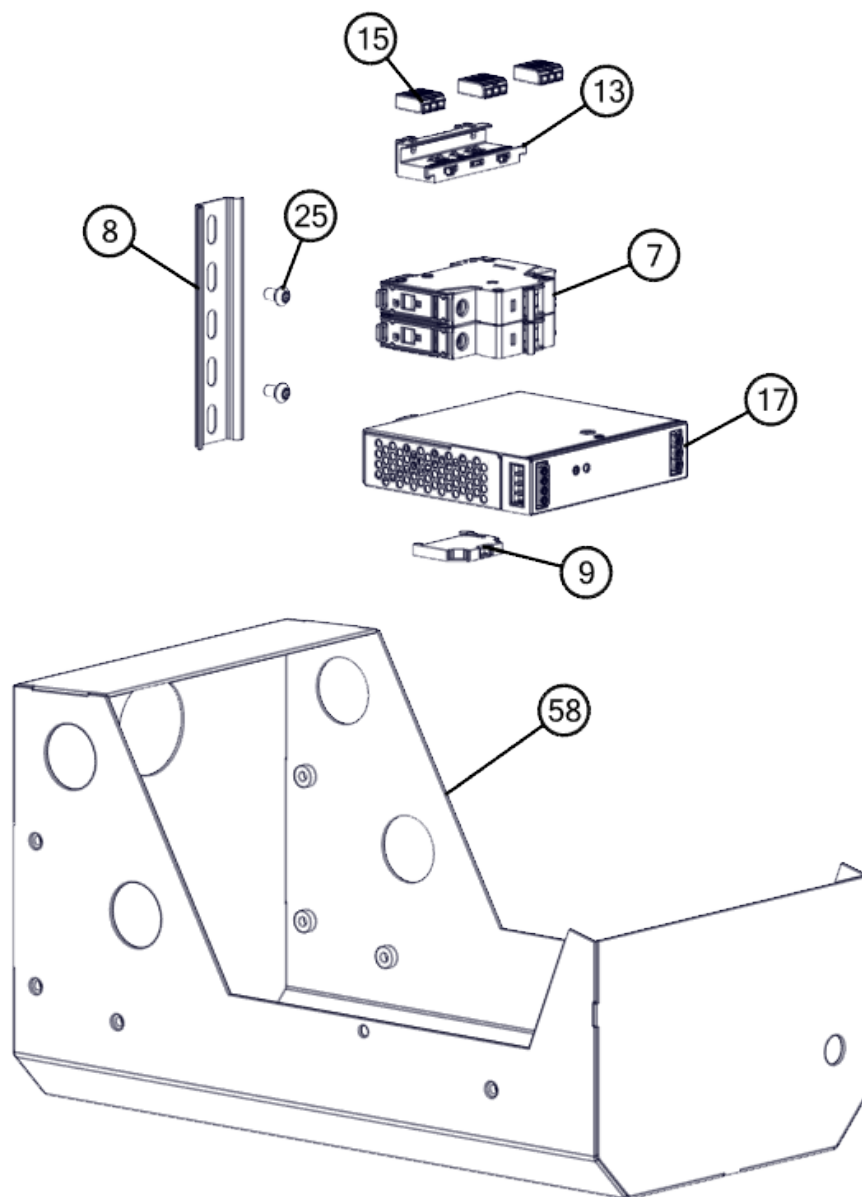


PEAK-3601 (HIDDEN CLAMP)



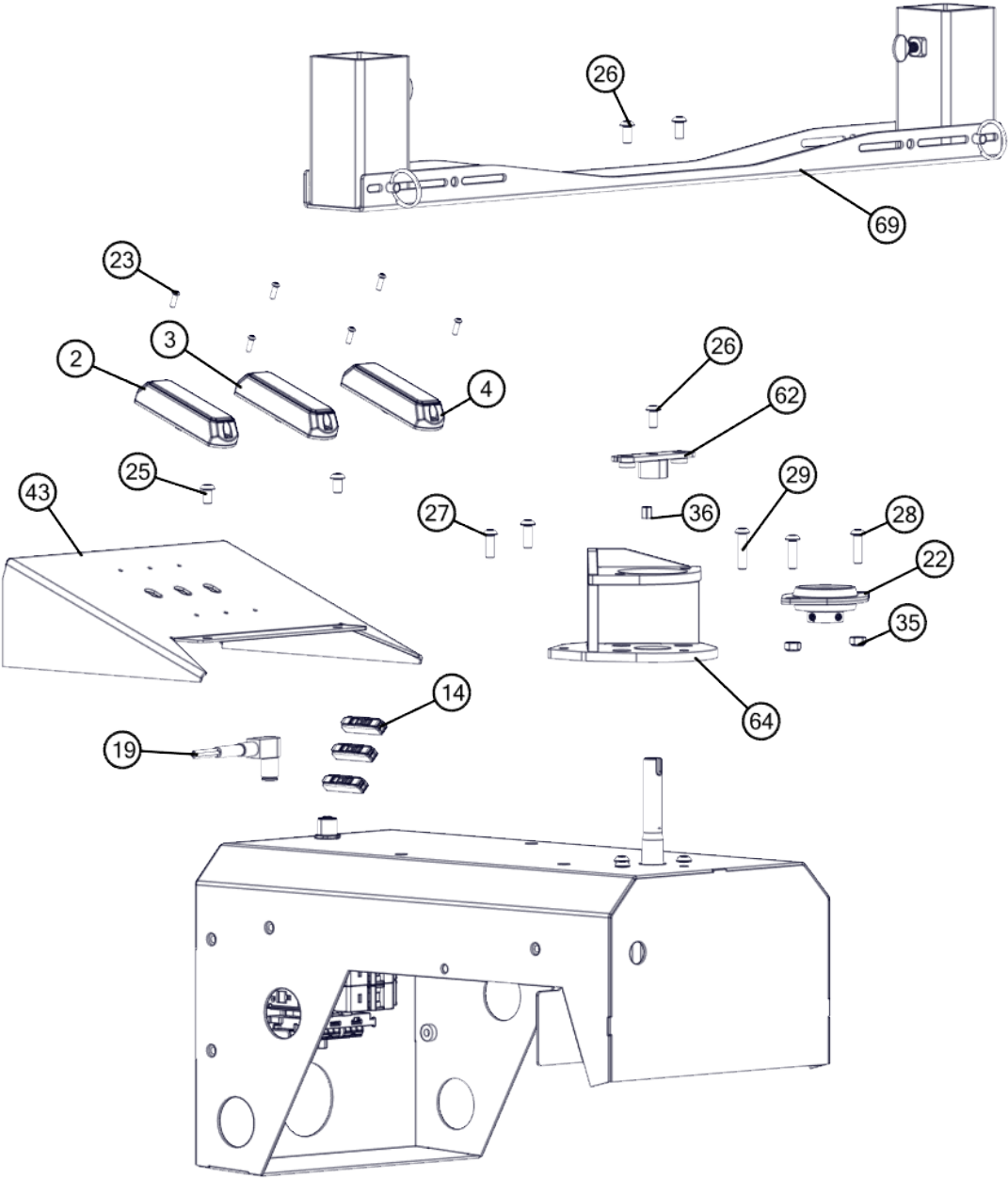


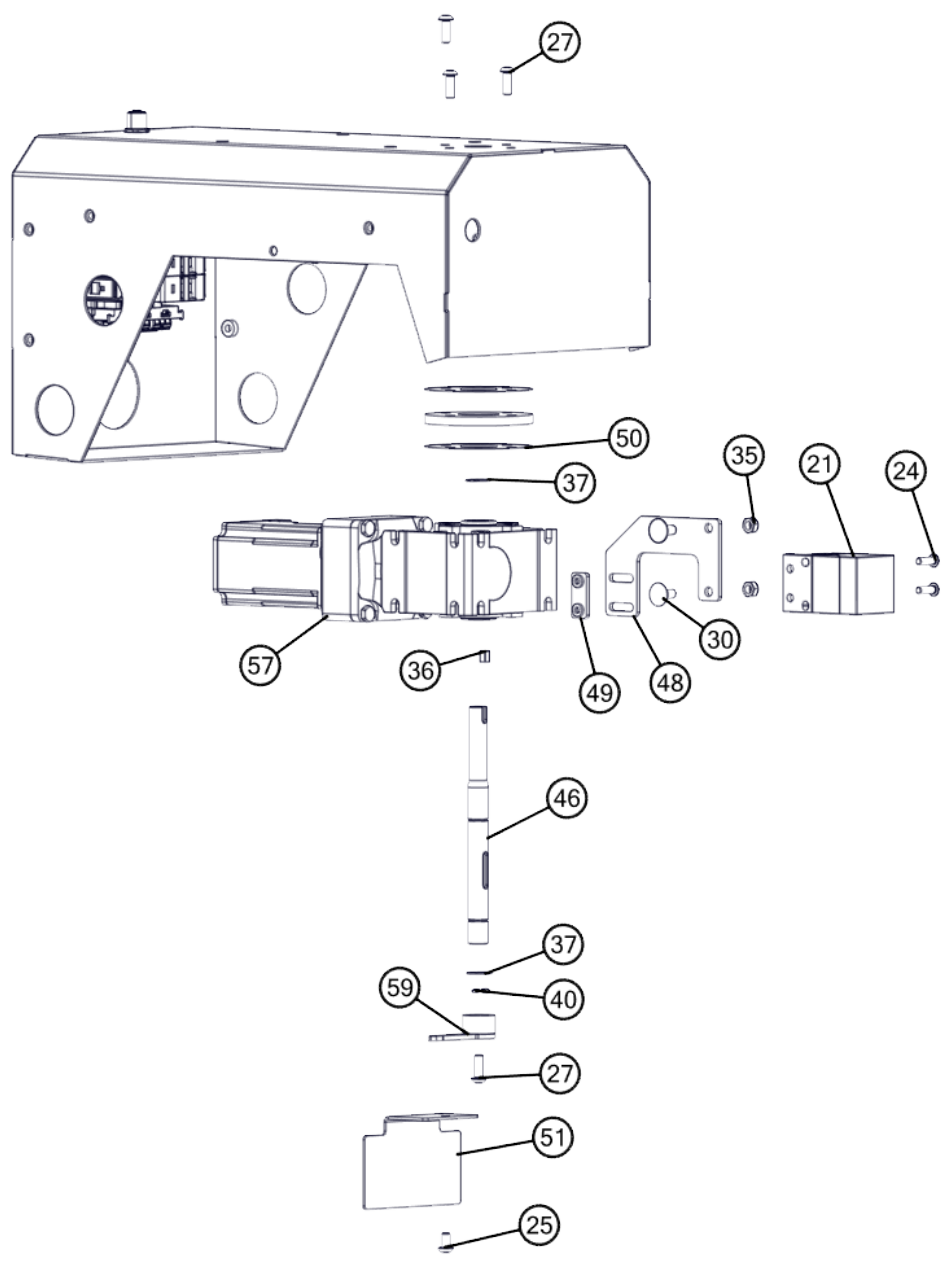


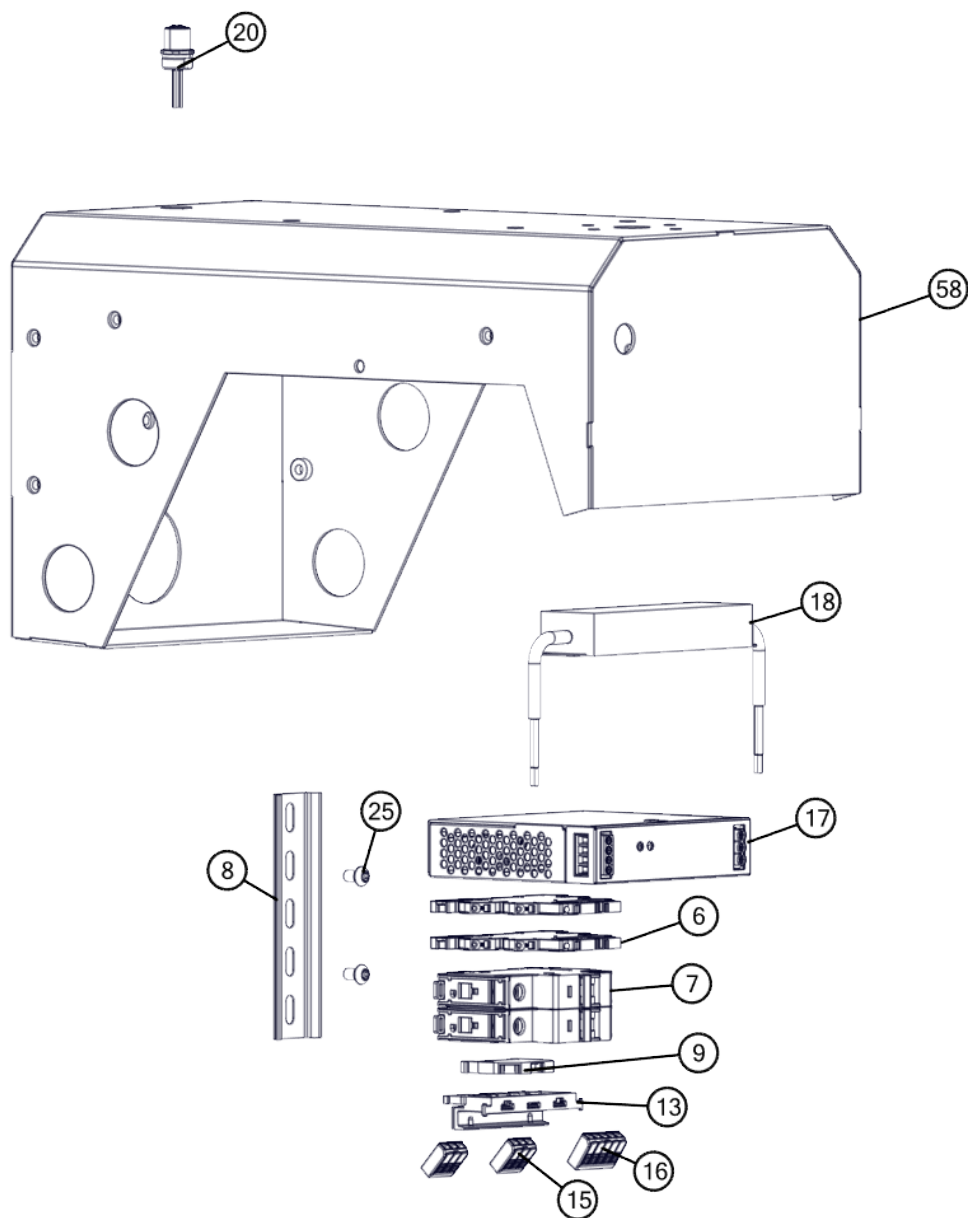


PEAK-360 (STICKS CLAMP)

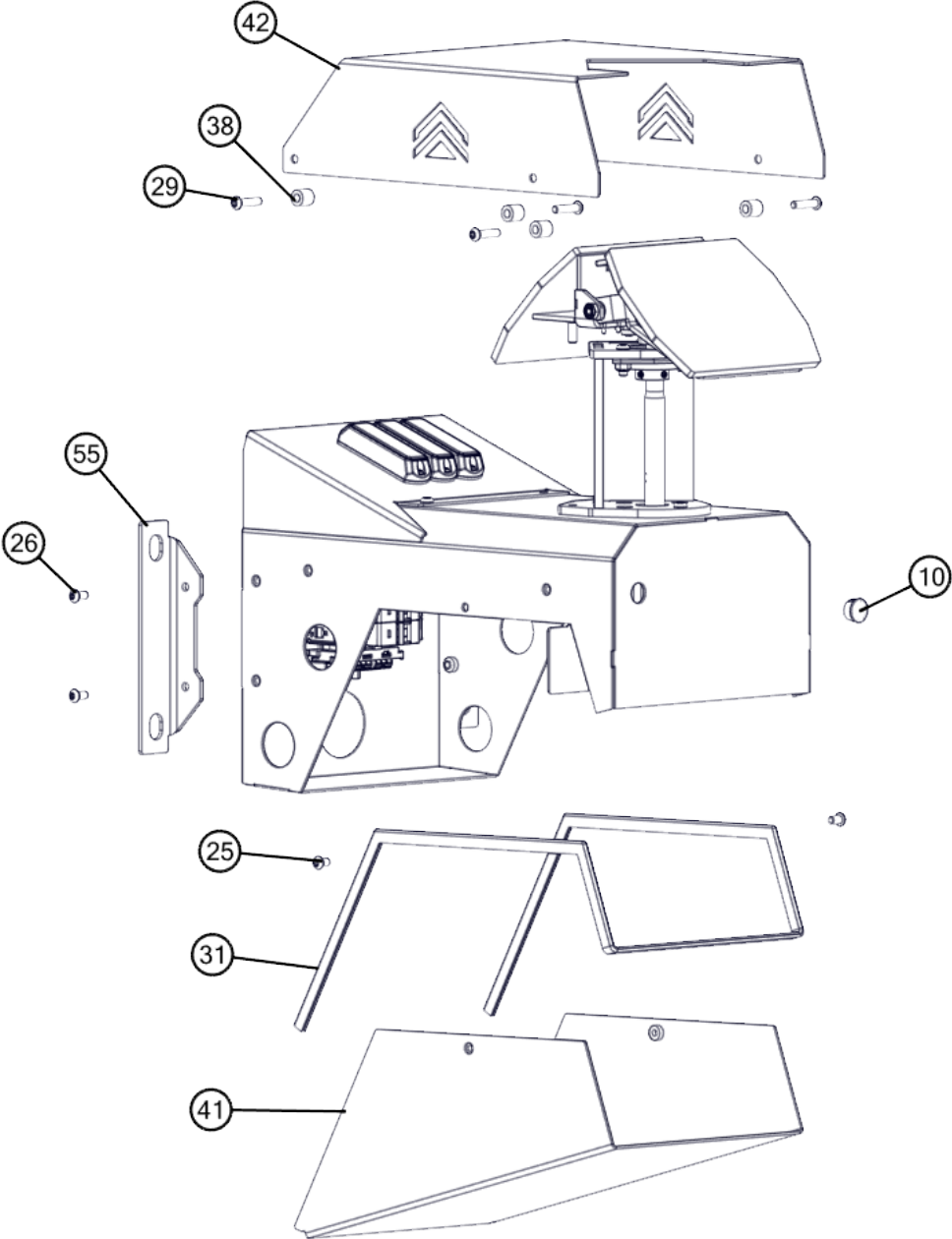


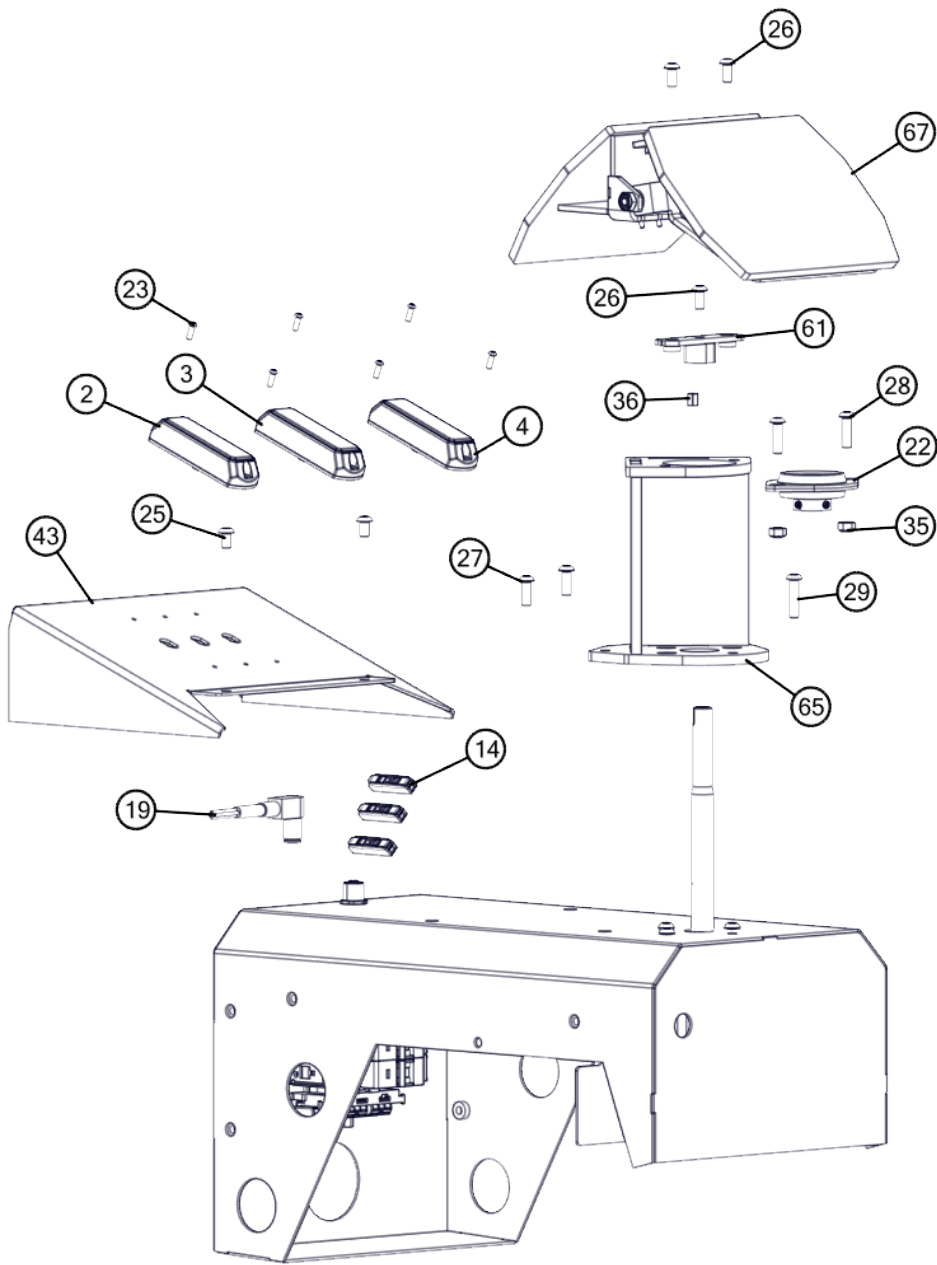


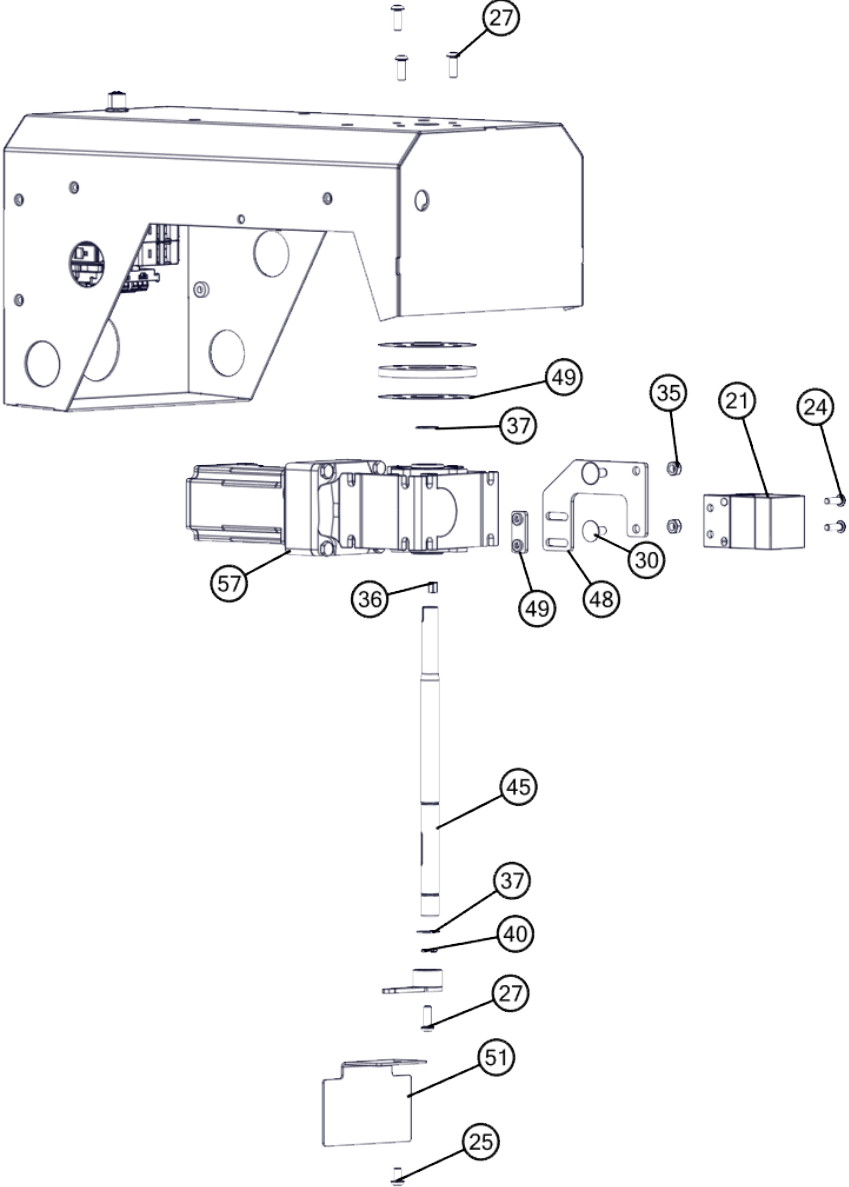


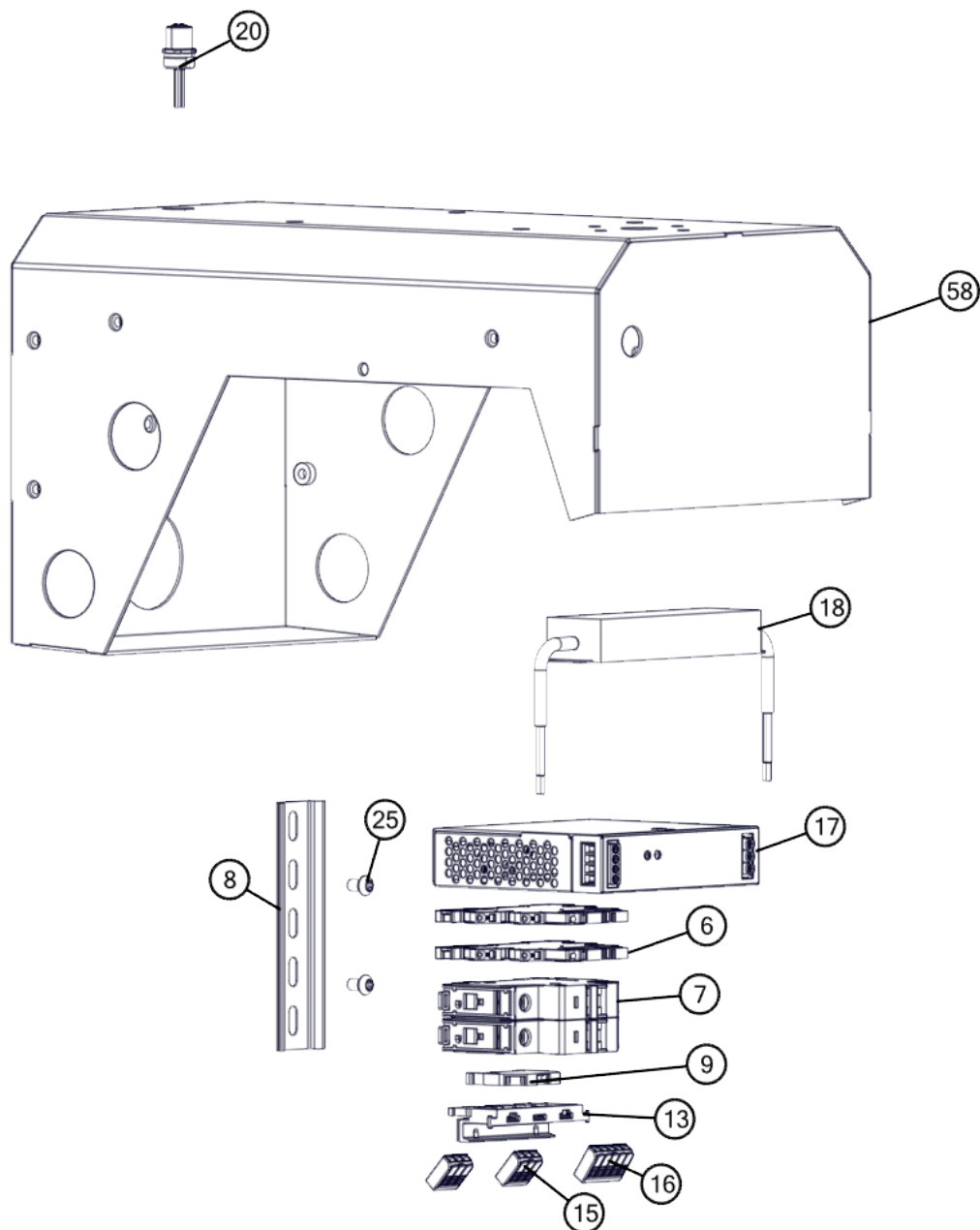


PEAK-360 (EXPOSED CLAMP)

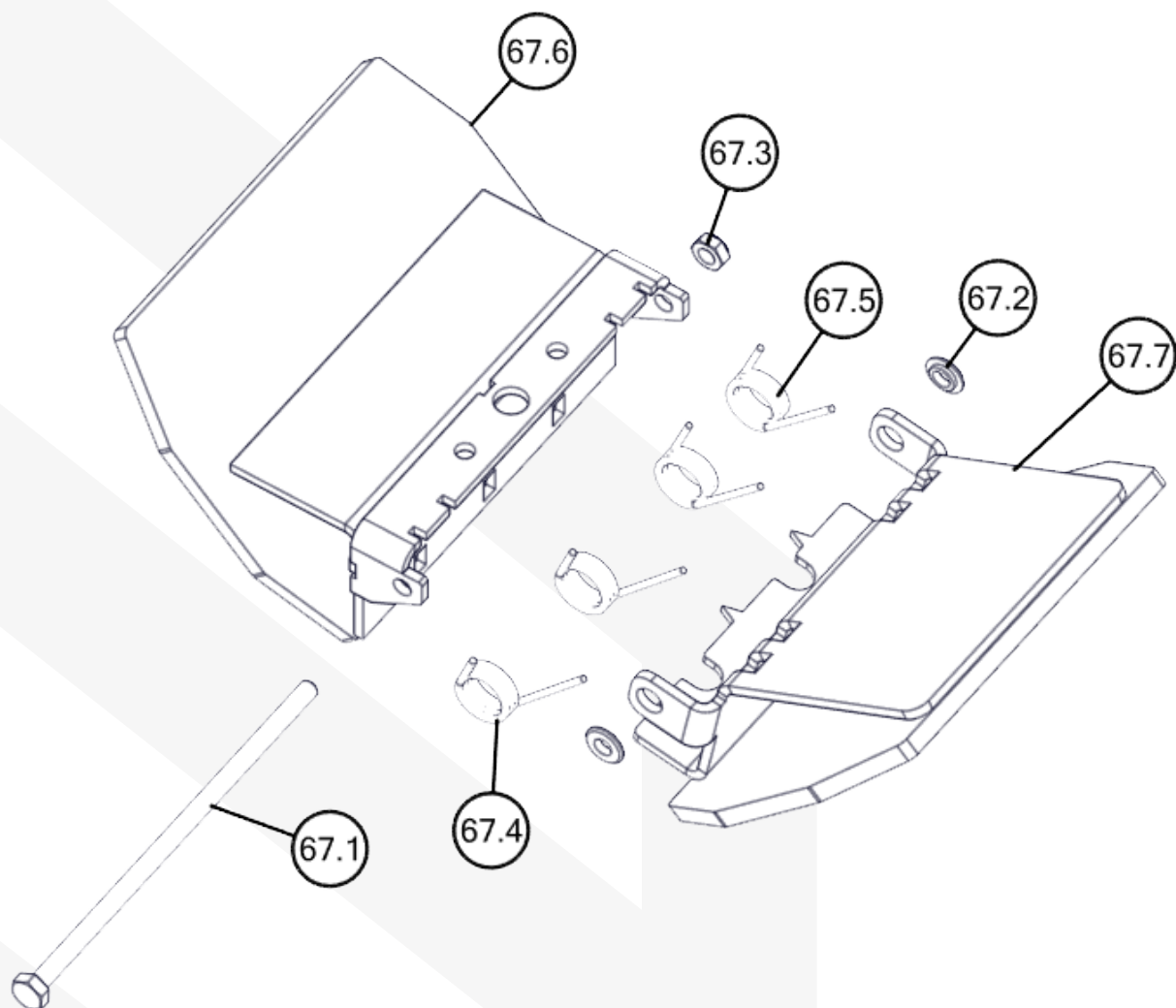


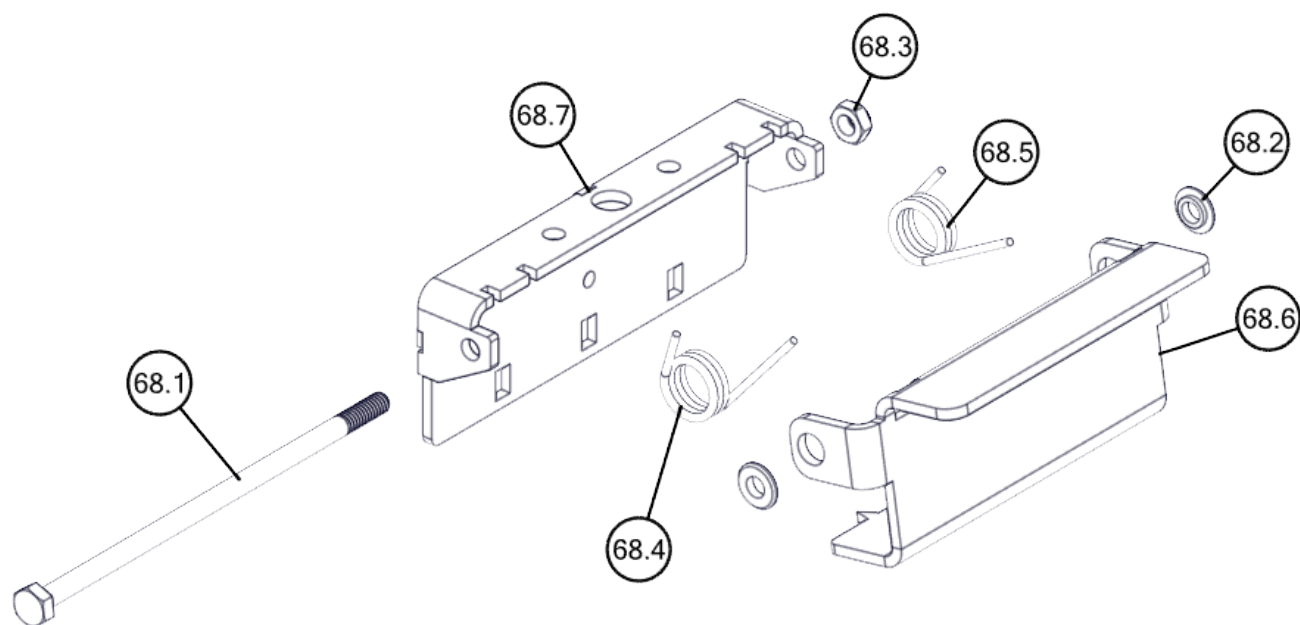


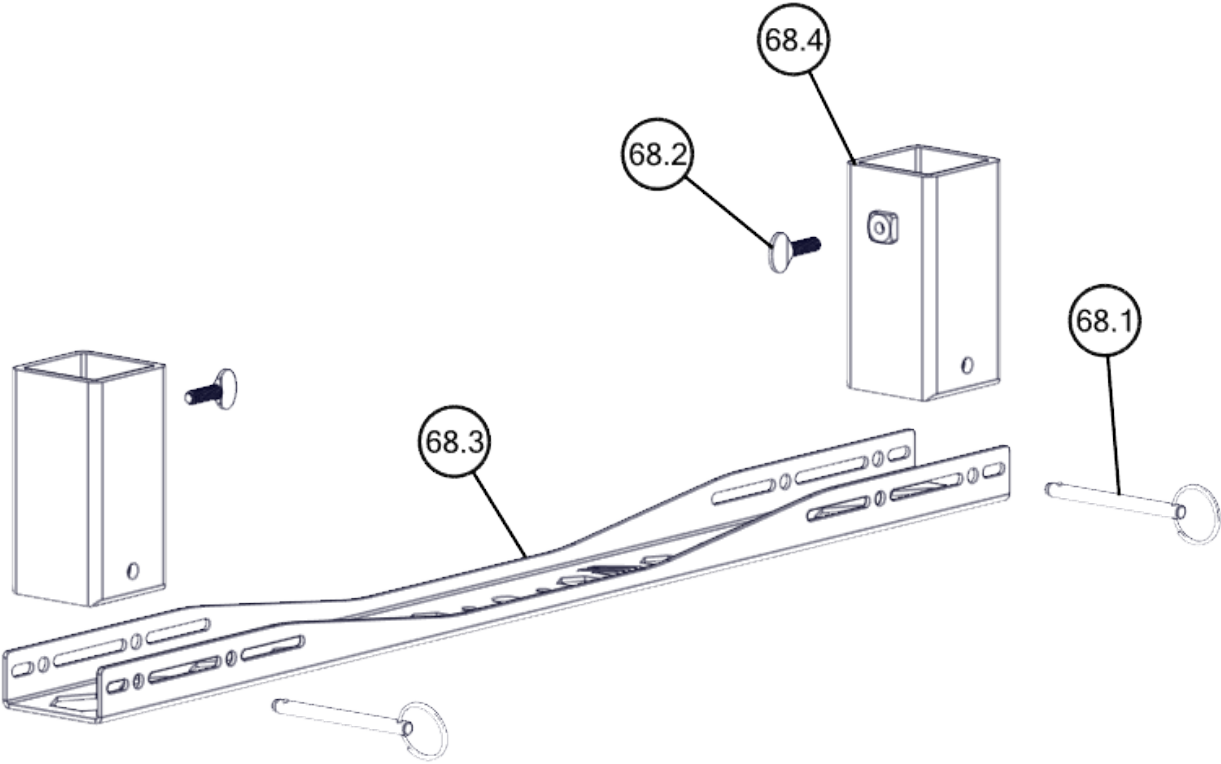




CLAMPS







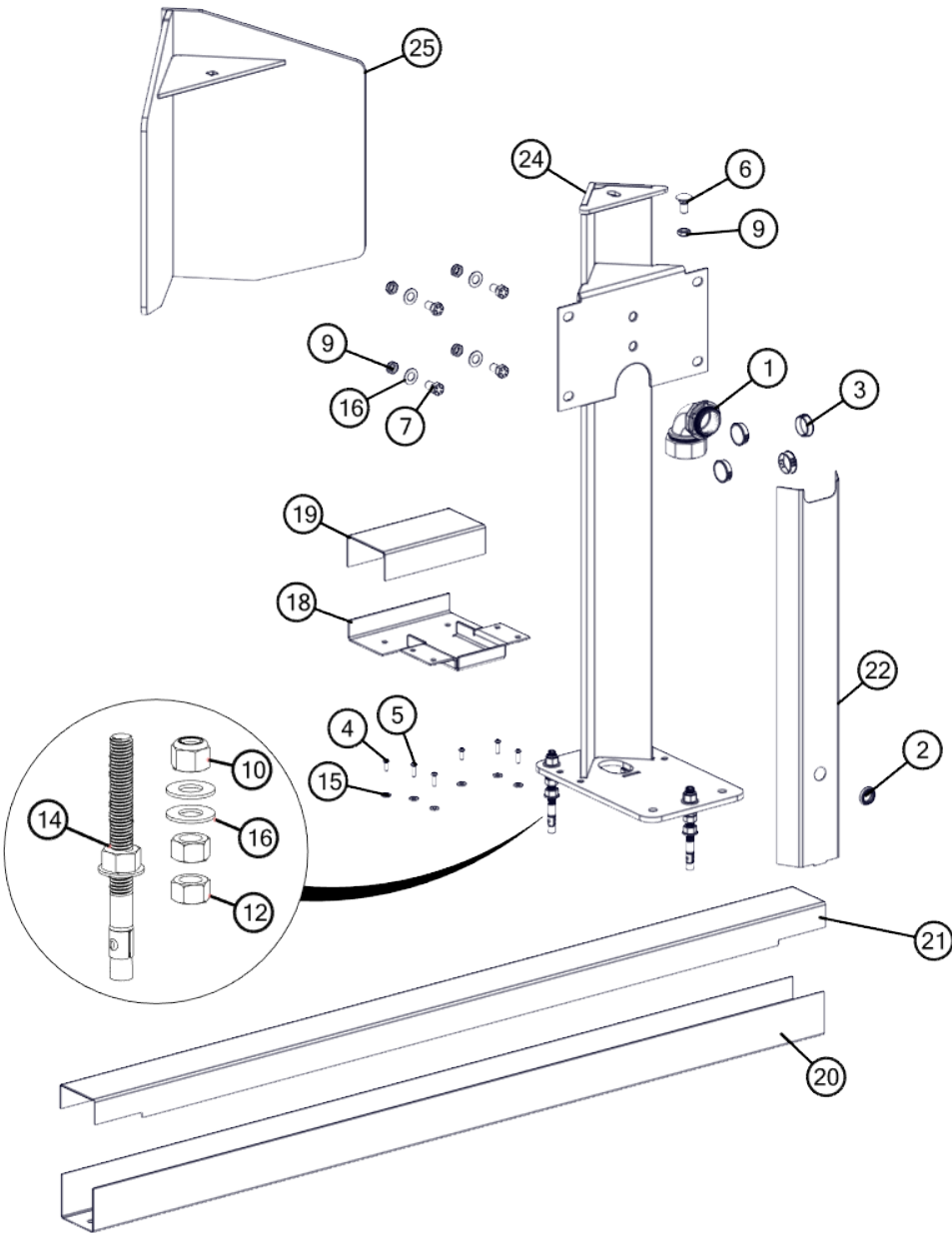
STAND/HOOP COMPONENTS

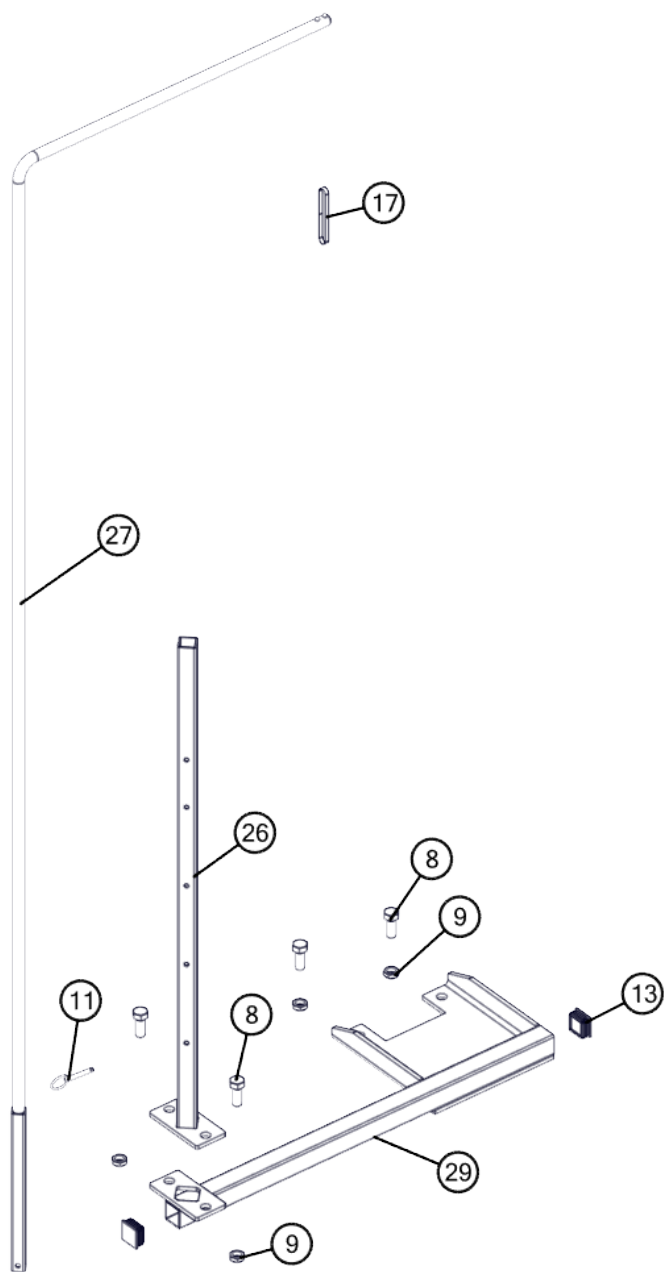
CODE	DESCRIPTION	PRT #
1	1-1/2" X 90 DEGREE LIQUID-TIGHT FLEXIBLE METAL CONDUIT ADAPTER	CAD-150LT-90DEG
2	7/8" PANEL HOLE PLUG	ELE-4000-088
3	1-3/8" PANEL HOLE PLUG	ELE-4001-138
4	M6 X 16MM TAMPER RESISTANT BUTTON HEAD TORX SCREW	HBT-M6X16-TR-SS
5	M6 X 20MM TAMPER RESISTANT BUTTON HEAD TORX SCREW	HBT-M6X20-TR-SS
6	1/2"-13 X 1" CARRIAGE BOLT - ZINC	HCB-50013-100-ZN
7	1/2"-13 X 7/8" HEX HEAD BOLT - ZINC	HHB-50013-088-ZN
8	1/2"-13 X 1-1/4" HEX HEAD BOLT - ZINC	HHB-50013-125-ZN
9	1/2"-13 THIN NYLOCK NUT - ZINC	HLN-50013-001-ZN
10	1/2"-13 NYLOCK NUT - ZINC	HLN-50013-005-ZN
11	1/4" X 1-1/8" STEEL RING-GRIP QUICK-RELEASE PIN	HRP-025-113
12	1/2"-13 STANDARD HEX NUT - ZINC	HSN-50013-005-ZN
13	1-1/4" POLYETHYLENE SQUARE PLUG	HTP-125
14	1/2"-13 X 5-1/2" CONCRETE WEDGE ANCHOR	HWA-50013-550
15	.250 ID X OD .750 X .060 FLAT WASHER - ZINC	HWS-250750-060-ZN
16	.500 ID X 1.060 OD X .070 FLAT WASHER - ZINC	HWS-5001060-070-ZN
17	#64 RUBBER BAND - TAN	RBB-35025-064
18	PEAK STAND RACEWAY ADAPTOR	TGP-520-001

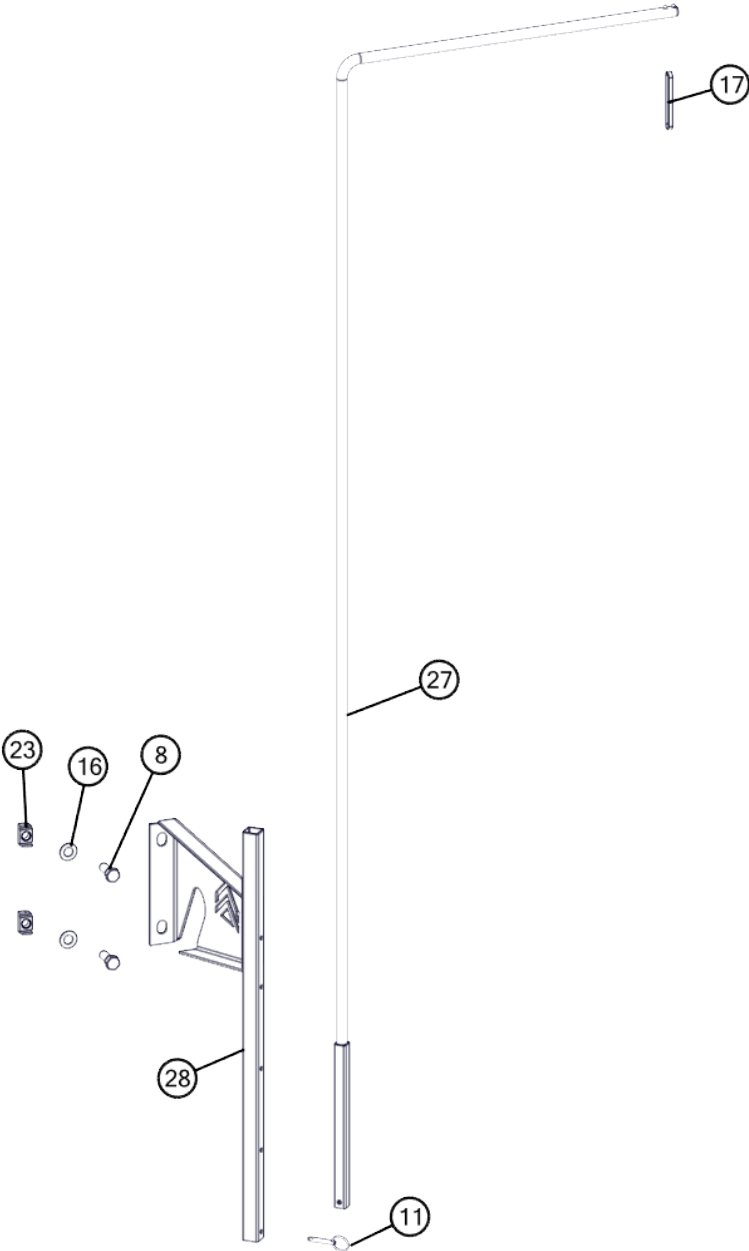
** Indicates recommended replacement parts. (See p. 82 for more information)

*** Indicated parts that are consumables and are not covered under the warranty agreement. In addition, any misuse, lack of maintenance, and/or modifications made to any Spire products will void all warranties.

CODE	DESCRIPTION	PRT #
19	PEAK STAND RACEWAY ADAPTOR CAP	TGP-520-002
20	PEAK STAND RACEWAY BASE XXX = LANE WIDTH	TGP-521-XXX
21	PEAK STAND RACEWAY CAP XXX = LANE WIDTH	TGP-522-XXX
22	PEAK 41-1/2IN STAND CABLE COVER	TGP-540-415
23	1/2"-13 CHANNEL STRUT NUT - ZINC	USN-50013-001-ZN
24	PEAK MOUNTING STAND YY = MATERIAL, ZZZ = HEIGHT AR = AR500 / MS = MILD STEEL	TGW-500-YY-ZZZ-PC
25	PEAK STAND BALLISTIC SHIELD WELDMENT - POWDER COATED	TGW-500-SHLD-PC
26	PEAK STAND HOOP TUBE WELDMENT - ZINC PLATED	TGW-530-002-ZN
27	PEAK HOOP WELDMENT - POWDER COATED	TGW-530-003-PC
28	WALL MOUNT HOOP ADJUSTMENT WELDMENT - ZINC PLATED	TGW-530-004-ZN
29	PEAK STAND HOOP MOUNTING BRACKET WELDMENT - ZINC PLATED	TGW-530-006-ZN





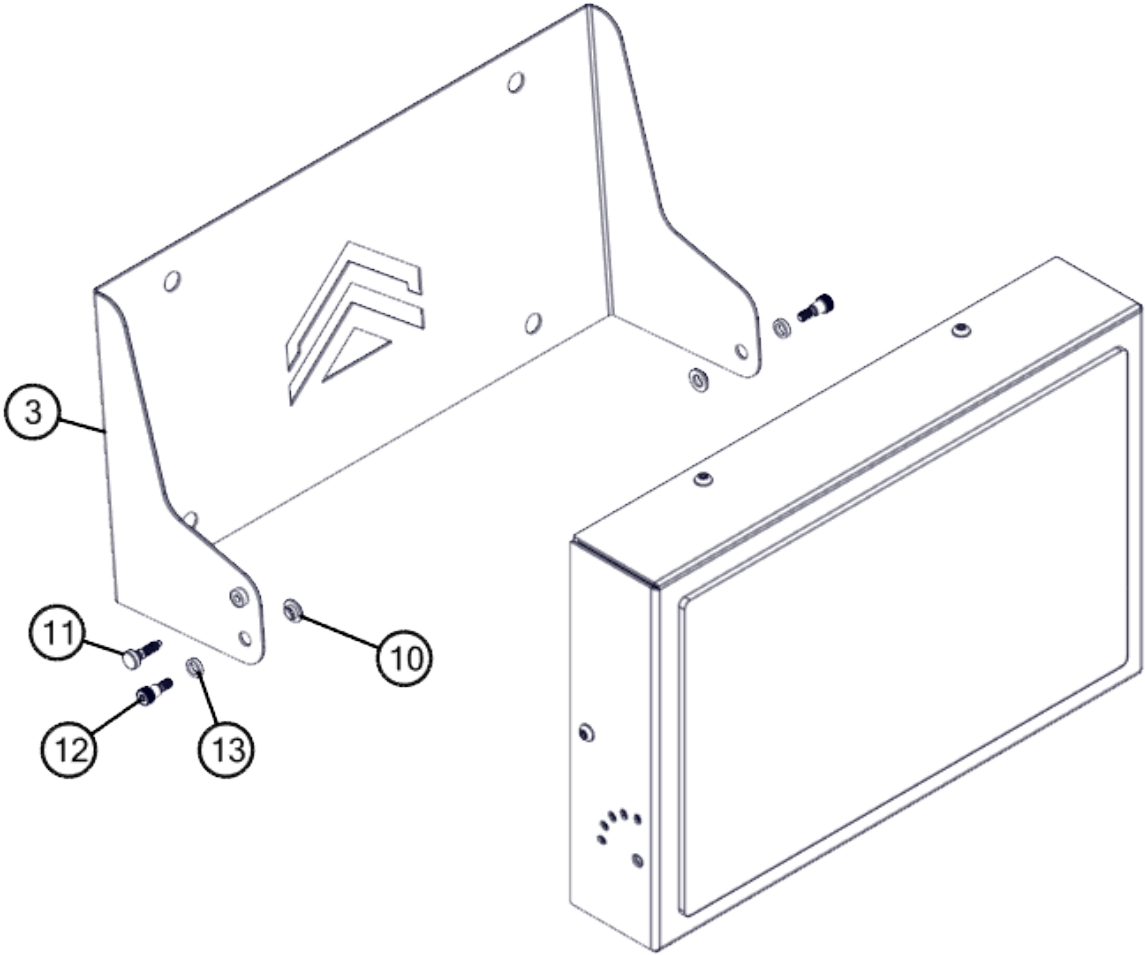


MASTER CONTROL

CODE	DESCRIPTION	PRT #	QTY
1	15" HMI ENCLOSURE COVER - POWDER COATED	CTP-7915-231	1
2	15" HMI ENCLOSURE BACK PANEL - WAGO	CTP-7915-232	1
3	15" HMI ENCLOSURE MOUNTING BASE - WAGO	CTP-7915-233	1
4	1" X .030 GORILLA DOUBLE SIDED TAPE	DST-1000G-030	1
5	POWER INPUT SWITCH	ELE-2032-030	1
6	CAT-6 RJ45 BULKHEAD COUPLER	ELE-31C6-RJ45	1
7	24VDC 2.5A POWER SUPPLY - 60W	ELE-6024-060	1
8	15.6" HMI - WAGO WEB PANEL	ELE-65156-WWP	1
9	1/4"-20 X 5/8" BUTTON HEAD SCREW - BLACK OXIDE	HBH-25020-063-BK	6
10	.313 X .620 X .060 INSULATION WASHER - NYLON	HIW-313620-060-NY	2
11	1/4"-20 X 1/2" RETURN SPRING PLUNGER**	HRS-25020-050	1
12	5/16" X 5/16" X 1/4"-20 SHOULDER BOLT	HSB-313313-25020	2
13	.317 ID X .500 OD X .125 FLAT WASHER - NYLON	HWS-317500-125-NY	2

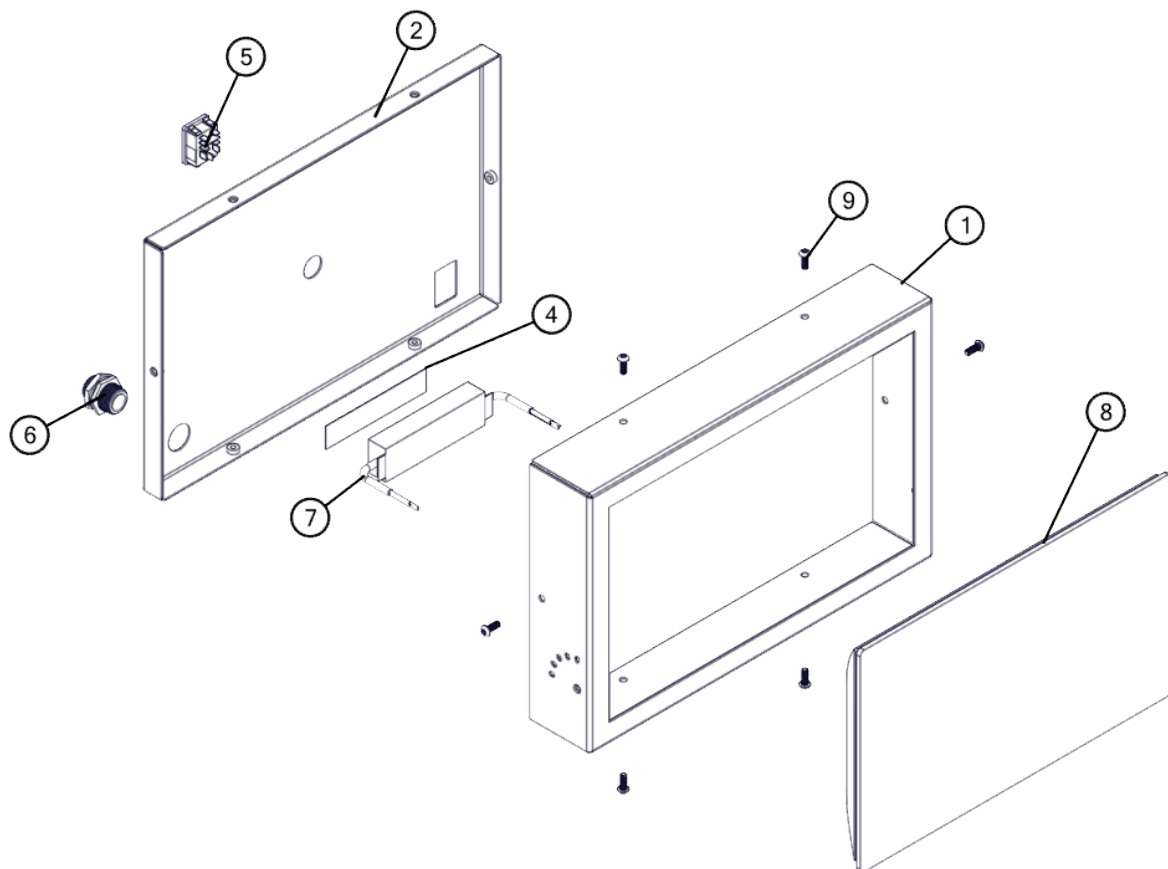
** Indicates recommended replacement parts. (See p. 120 for more information)

*** Indicated parts that are consumables and are not covered under the warranty agreement. In addition, any misuse, lack of maintenance, and/or modifications made to any Spire products will void all warranties.



POWER	VALUE
Power Consumption	24 VDC
Voltage	20.8 Watts Max

TEMPERATURE	VALUE
Operating	-20-55°C (-4-131°F)
Storage	-20-70°C (-4-158°F)



MAINTENANCE:

ROUTINE MAINTENANCE

TIME TABLE	PROCEDURE
Monthly	1. Check each screw on the clamp and shaft to ensure they have remained tight. If they are loose, add medium-strength Loctite and torque them to 80 in-lbs.
Biannually	1. Check surge protector inside main control box and replace if needed.
Yearly	1. Check all the screws and bolts on the unit and the mounting assembly have remained tight. If any are loose, add medium-strength Loctite and hand tighten. 2. With power off, check all wire connections inside the unit all are tight. If they are loose, hand tighten them.

TOOLS

LIST OF TOOLS

- T-30 Torx Driver
- T-25 Torx Driver
- Medium-Strength Thread Locker
- Mini Flathead Screwdriver
- #2 Phillips Screwdriver
- Multimeter

RECOMMENDED REPLACEMENT PARTS

DESCRIPTION	PRT #	QTY
HIDDEN CLAMP	TGA-300-CLMP-HD	1
EXPOSED AR-500 CLAMP	TGA-300-CLMP-EX	1
STICKS CLAMP	TGA-300-CLMP-STX	1
CLAMP MOTOR***	MTR-TRN-STND	1
PEAK-360(i) PLC	ELE-6005-530	1
SURGE PROTECTOR MODULE	ELE-CITEL-MOD	1
1/4"-20 X 1/2" RETURN SPRING PLUNGER	HRS-25020-050	1
PEAK-360 HARDWARE REPLACEMENT KIT (Below items are included in kit)	PEAK-360-HARDWARE-KIT	1
MEDIUM-STRENGTH LOCTITE	THREADLOCK-MS-06ML	1
CLAMP/SHAFT KEY	HMK-5MMUB-8MM-SS	10
QUICK RELEASE PIN	HRP-025-250	2
CLAMP ADAPTER BUTTON SCREW	HBT-M6X12-TR-SS	20
HOGAN HOUSE LID BUTTON SCREW	HBT-M6X10-SS	20
CLAMP SHAFT SPRING WASHER	HWS-M6-WV	10
T-25 TORX BIT	TORX-25X1-TR	2
T-30 TORX BIT	TORX-30X1-TR	2
PEAK-360i HARDWARE REPLACEMENT KIT (Below items are included in kit)	PEAK-360i-HARDWARE-KIT	1
MEDIUM-STRENGTH LOCTITE	THREADLOCK-MS-06ML	1

*** Indicates parts that will need to be programmed for a specific lane. It is recommended for them to be purchased and to remain on Spire shelves where they can be programmed to a specific lane as needed.

DESCRIPTION	PRT #	QTY
CLAMP/SHAFT KEY	HMK-5MMUB-8MM-SS	10
SHAFT SPACER	TGP-300-003	2
CLAMP ADAPTER BUTTON SCREW	HBT-M6X12-TR-SS	20
HOGAN HOUSE LID BUTTON SCREW	HBT-M6X10-SS	20
CLAMP SHAFT SPRING WASHER	HWS-M6-WV	10
T-25 TORX BIT	TORX-25X1-TR	2
T-30 TORX BIT	TORX-30X1-TR	2

SERVICE PLANS:

OVERVIEW

At the core of Spire Ranges is our commitment to keep our installed equipment in each range running at its optimum performance. To maintain that standard, below is a list of the different service package levels available to our clients. We look forward to providing your range with a quote that is unique to your range.

LEVEL	TRIPS PER YEAR	PARTS DISCOUNT
Bronze	1	0%
Silver	2	5%
Gold	4	10%

SERVICES OFFERED WITH EACH SITE VISIT:

- Provided Refresher Training
- Software Update/Reconfiguration
- Test all Motors, Valves, Cylinders, Lights, & Proximity Switches
- Target Clamp Inspection/Adjustment
- Check/Secure Electrical Connections
- Verify Proper Voltages
- Verify Controller(s) (HMI's/Computer) Functionality
- Assess Cable Tension & Adjust
- Assess Track Health & Tighten/Replace any Loose/Missing Hardware
- Verify Proper Charging of Targets
- Stall/Bench Inspection
- Trap Inspection
- Overall Range Health Inspection

TROUBLESHOOTING:

Given below are possible causes and solutions for system problems. Within this section, you will find sequential steps that can be used to help troubleshoot a problem. If a problem persists after following these troubleshooting guidelines, please contact the Spire support team.

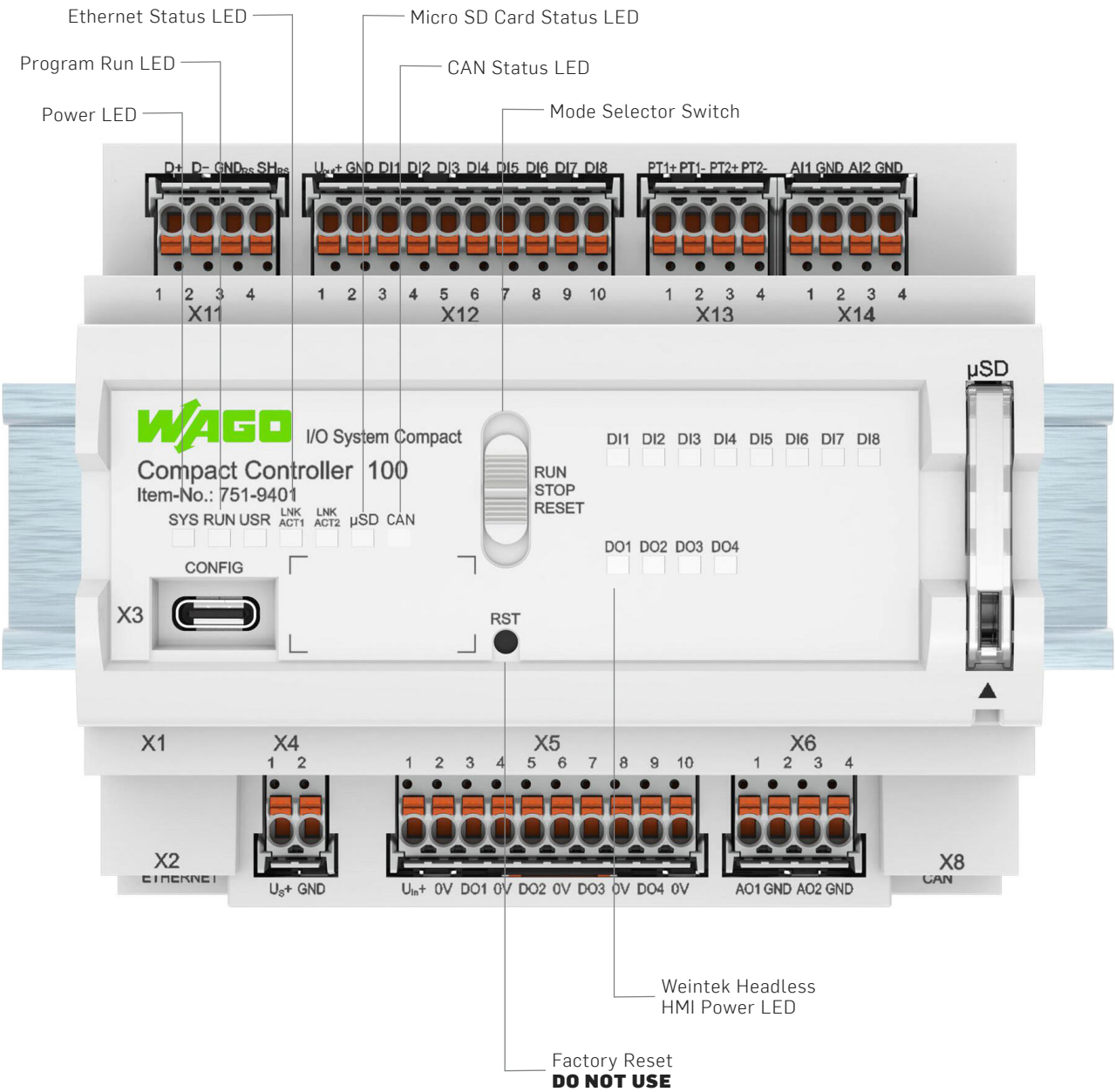
1.0 HMI TOUCH SCREENS (MASTER & LOCAL)

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
1.1 Dark Blank Screen	(1) No power supplied to HMI	(1) Check the power supply connection. (2) Check circuit breaker to see if tripped. (3) If problem persists, contact Spire for technical support.
1.2 Entire HMI Touch Screen Nonresponsive	(1) HMI error	(1) Cycle power to HMI.
	(2) HMI / PLC fault	(1) Cycle power to the PLC.
1.3 Communication error	(1) Ethernet (RJ45) cable unplugged or damaged	(1) Check all RJ45 connections in control panel. (2) Check RJ45 connection to screen. (3) Follow cable to ensure they are not smashed or damaged.
	(2) PLC error	(1) Cycle power to the PLC. (2) See section 6 for more information on PLC errors.
1.4 Max number of visualization clients reached	(1) Too many browsers are connected at once	(1) Up to 3 devices can be using the interface at one time. If a local/master touch screen is present, both will count as a device. Disconnect any device that is not needed/wanted. (2) Reload the webpage.
	(2) PLC error	(1) Cycle power to the PLC.

2.0 PEAK TARGET UNITS

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
2.1 Misaligned target(s)	(1) Alignment error	(1) Navigate to the Menu Screen on the HMI Touch Screen. (2) Select Target Calibration.
	(2) Homing sensor arm misalignment	(1) Perform a homing operation. (2) Rotate homing sensor arm as required. (3) Reperform homing operation.
	(3) Homing sensor malfunction	(1) See section 9.0 - 9.1.
2.2 Target continues to home	(1) Homing sensor misalignment	(1) Loosen two adjustment bolts on homing sensor. (2) Adjust homing sensor in/out and twist closer/further from the homing sensor arm.
	(2) Homing sensor malfunction	(1) See section 9.0 - 9.1.
2.3 Individual nonresponsive target (not moving)	(1) Turning motor position error	(1) On the manual operation screen, select the target in question. (2) Navigate to the settings page on the HMI touch screen. (3) Press the home button. (4) If the problem persists, cycle power to the range.
	(2) Obstruction in drive system	(1) Power off the target. (2) Check the clamp and shaft for obstruction. (3) Remove obstruction if one is present.
	(3) Turning motor fault	(1) Contact Spire for technical support.
2.4 All targets nonresponsive (not moving)	(1) PLC error	(1) Cycle power to the PLC. (2) See section 6 for more information on PLC errors.
	(2) Single motor baudrate incorrect	(1) Power off one target at a time. (Use the circuit breaker to power off for all lanes except the ones with the comms repeaters. Unplug the small green motor power cable on those lanes.) (2) Monitor when range is operational again. The last target powered off is the one with the incorrect baudrate. (3) Contact Spire for technical support.
	(3) First comms repeater fault	(1) Contact Spire for technical support.

PLC LED STATUS

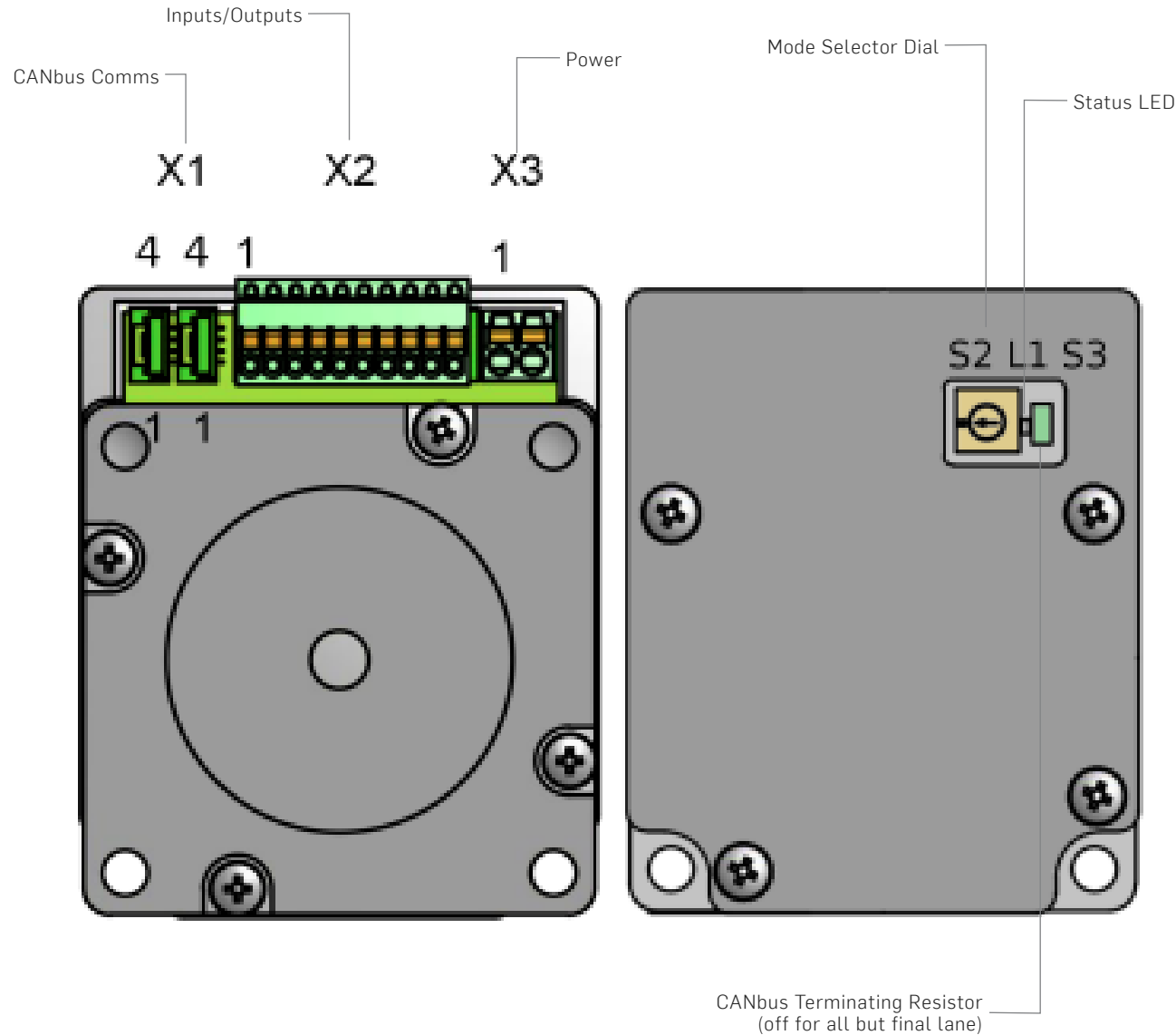


PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
6.0 No SYS (Power) Light	(1) Bad power cable connection/damaged cable	(1) Inspect the PLC power cable (cable coming out of the bottom of the PLC in connector X4) for damage. (2) Ensure that the PSU in the control box has power and that no breakers are flipped.
	(2) Bad PLC	(1) Contact Spire for a replacement PLC.
6.1 Orange SYS Light	(1) Device is in startup/boot process	(1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.
	(2) Bad PLC	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.2 Orange Flashing SYS Light	(1) "Fix IP Address" mode (temporary setting until the next reboot due to RST button press)	(1) Connect to the device via the standard address (192.168.1.17) or restart the device to restore the original value set.
	(2) Bad PLC	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.3 Green/Red Flashing SYS Light	(1) Firmware update mode	(1) Wait 30 min and check again. (2) If it continues to stay in this state, contact Spire.
	(2) Bad PLC	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.4 Green Flashing RUN Light	(1) No application and now boot project loaded	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.5 Red RUN Light	(1) Applications loaded and all in the "STOP" status	(1) Set the mode selector switch to "RUN" to start the application
6.6 Green/Red Flashing RUN Light	(1) At least one application in the "RUN" status and one in the "STOP" status	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.7 Red (goes out briefly) RUN Light	(1) Warm start reset completed	(1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.
6.8 Red (goes out longer) RUN Light	(1) Cold start reset completed	(1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
6.9 Red Flashing RUN Light	(1) At least one application after in the "STOP" status after exception (e.g., memory access error)	(1) Start the application with a reset via the mode selector switch. (2) Power cycle the controller. (3) Contact Spire for a replacement PLC.
6.10 Orange/Green Flashing RUN Light	(1) Load above threshold value 1	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.11 Orange RUN Light	(1) Runtime system in debug state (break-point, single step, individual cycle)	(1) Start the application with a reset via the mode selector switch (hold in reset position for 5 seconds then move back to RUN position). (2) Power cycle the controller. (3) Contact Spire for a replacement PLC.
6.12 No RUN Light	(1) No runtime system loaded	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.13 No Green LNK ACT 1 (Ethernet Status) Light	(1) Bad/damaged ethernet cable	(1) Replace ethernet cable.
	(2) Bad/damaged ethernet switch	(1) Swap PLC ethernet cable to another port on the switch.
	(3) Bad PLC	(1) Contact Spire for a replacement PLC.
6.14 No mSD Light	(1) No memory card access	(1) Some ranges may not have a micro SD card. If this is the case, then disregard the missing light.
6.15 No CAN Light	(1) The CAN interface has not been configured	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.16 Alternating red 50 ms / green 50 ms CAN Light	(1) Configuration in progress	(1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.
6.17 Alternating red 200 ms / green 200 ms CAN Light	(1) Configuration invalid	(1) Power cycle the controller. (2) Contact Spire for a replacement PLC.
6.18 Green 200 ms / off 800 ms CAN Light	(1) The CANopen interface has the status "Stop"	(1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.
6.19 Green 200 ms / off 200 ms CAN Light	(1) The CANopen interface has the status "Preoperational"	(1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
6.20 Red CAN Light	(1) The CANopen interface has the status "Bus Off" (short-circuit or other major fault)	(1) Check the CANbus connections (comms cable). Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller.
6.21 No DO1 Light	(1) No Headless Wientek in system	(1) Some systems do not have a headless wientek. If this is the case, ignore this.
	(2) Runtime not fully loaded	(1) See 6.4 - 6.12.

MOTOR LED STATUS



PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
7.0 No Light	(1) Bad power cable connection/damaged cable	(1) Inspect the motor power cable (X3) for damage. (2) Ensure that the PSU has power and that no breakers are flipped.
	(2) Bad motor	(1) Contact Spire for a replacement motor.
7.1 Blinking Green Light (1sec interval)	(1) Device is operating normally	(1) N/A
7.2 One On, One Off Green Light	(1) General error	(1) Recalibrate the motor.
7.3 Two On, One Off Green Light	(1) Voltage error	(1) Check that capacitor is in place on the PSU and recalibrate the motor. (2) Ensure the PSU is supplying 48V DC to the motor.
7.4 Three On, One Off Green Light	(1) Temperature error	(1) Power down the system and let it cool down for 10-15 minutes.
7.5 Four On, One Off Green Light	(1) Overcurrent error	(1) Check that there are no debris in the clamp or motor housing.
7.6 Five On, One Off Green Light	(1) Controller error	(1) Power cycle the system. (2) Contact Spire for a replacement motor.
7.7 Six On, One Off Green Light	(1) Watchdog-Reset error	(1) See 6.0 - 6.20. (2) Contact Spire for a replacement motor.

CLAMP HOMING SENSOR LED STATUS



PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
9.0 No Green Light	(1) Bad cable connection/damaged cable	(1) Inspect the cable for damage. (2) Ensure that the PSU has power and that no breakers are flipped. (3) Check wires going into the larger green motor connector. Ensure that all wires are seated fully inside the connector.
	(2) Bad PSU	(1) Contact Spire for a replacement PSU.
	(3) Bad sensor	(1) Contact Spire for a replacement sensor.
9.1 No Yellow Light	(1) Clamp homing bracket not detected	(1) Adjust the sensor position to be closer to the travel location of the clamp homing bracket. (2) Recalibrate the lane.
	(2) Bad cable connection/damaged cable	(1) Inspect the cable for damage. (2) Check wires going into the larger green motor connector. Ensure that all wires are seated fully inside the connector.
	(3) Bad sensor	(1) Place a piece of metal over the sensor area temporarily to determine if sensor is operational. If not detected, contact Spire for a replacement sensor.

SURGE PROTECTOR STATUS



Visual Fault Indicator

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
10.0 One visual Indicator is red	(1) Module has experienced a surge	(1) Replace module at owner's convenience.
10.1 Both visual Indicators are red	(1) Module has experienced multiple surges	(1) Not able to protect. Replace module immediately.

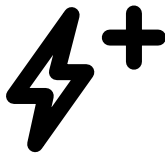
POE INJECTOR STATUS



LED Status Indicator



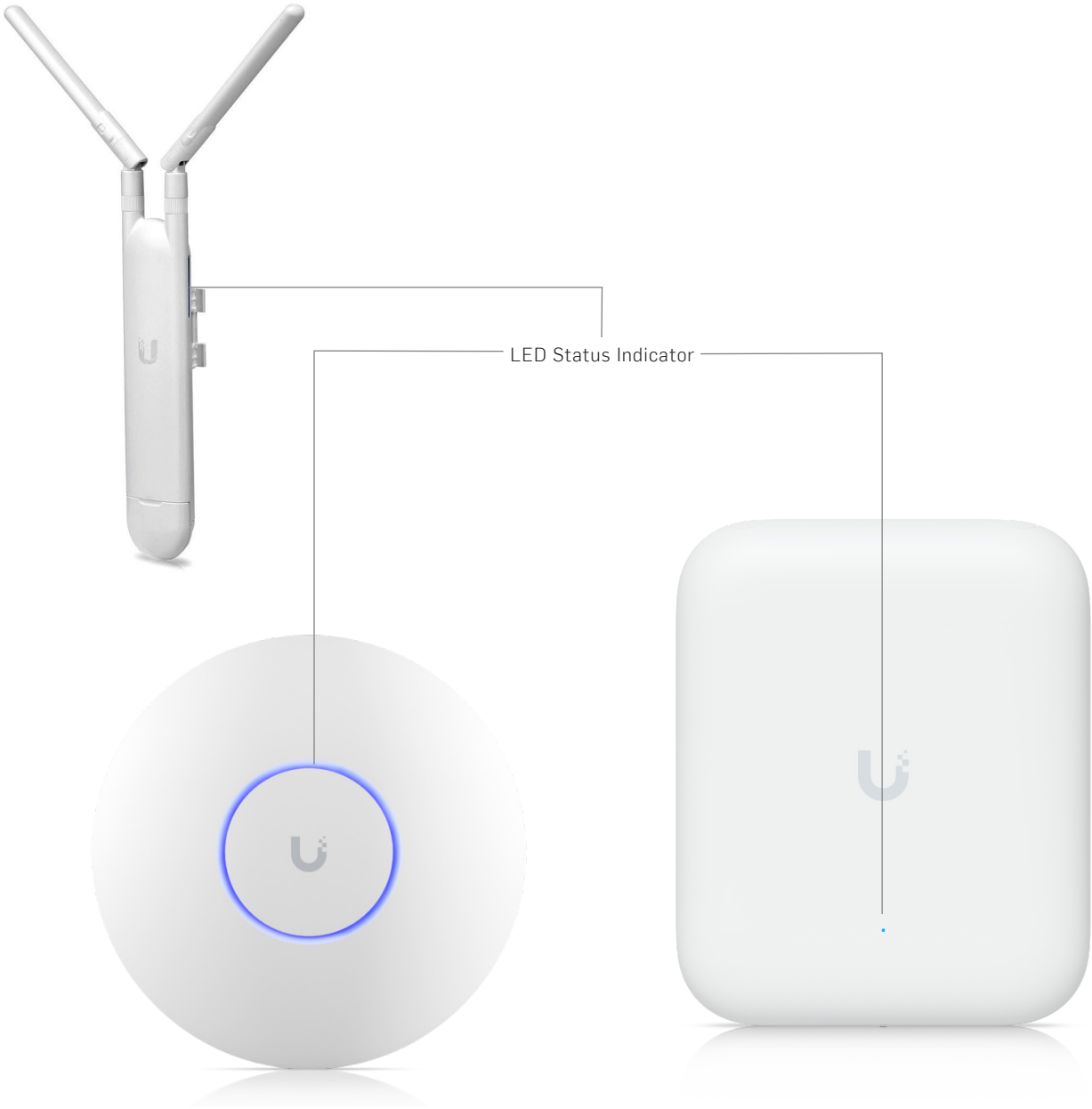
Standard Port



POE Port

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
11.0 Steady White Light	(1) Operating correctly	(1) No troubleshooting needed.
11.1 Blinking Light	(1) Bad wiring	(1) Double check wiring. (2) Replace RJ45 ends on both ends of the ethernet cable in the POE port. (3) If not solved, replace ethernet cable.
	(2) Bad POE Injector	(1) Replace POE Injector.
11.2 No Light (Off)	(1) Not receiving power	(1) Check wiring. (2) Check breaker.
	(2) Bad POE Injector	(1) Replace POE Injector.

ACCESS POINT (AP) STATUS



PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
12.0 Flashing White / Off Every 1/2s	(1) The device is initializing and booting up	(1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement.
12.1 Steady White	(1) AP had power event that caused it to lose it programming.	(1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement or a reprogramming.
12.2 Slow Flashing Blue	(1) The device is initializing and booting up	(1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement.
12.3 Blue and Flashing Off Every 5s	(1) The device is initializing and booting up	(1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement.
12.4 Steady Blue	(1) Operating correctly	(1) No troubleshooting needed.
12.5 Strobing White / Off	(1) Internal error	(1) Power cycle the AP. (2) If it does not resolve itself, contact Spire for a replacement.
12.6 Quickly Flashing White / Blue	(1) The device firmware is currently being upgraded - do not interrupt the process.	(1) Wait 15 min. (2) If it does not resolve itself, contact Spire for a replacement.
12.7 Blue and Flashing Off Every 5s	(1) Access Point has lost network connectivity and is searching for a wireless uplink.	(1) Check any and all ethernet cables between the AP and the router. (2) If it does not resolve itself, contact Spire for further troubleshooting.
12.8 Rapid Flashing Blue / Off	(1) The device "Locate" feature was activated in the UniFi Network application.	(1) Power cycle the AP. (2) If it does not resolve itself, contact Spire for a replacement.
12.9 Flashing White-Blue-Off	(1) The device is in TFTP mode.	(1) If this wasn't intentional, please ensure the device's reset button isn't jammed (it should click when pushed).
12.10 LED Off	(1) Bad power	(1) Verify the Power, POE, and Ethernet cables to troubleshoot.
	(2) Bad AP	(1) Contact Spire for a replacement.

GLOSSARY:

TERM	DEFINITION
Calibration	Adjusting the various parts of the system precisely for their particular function.
Consumable Components	Products that are expected to wear out and that get used up throughout the lifetime of the product (will need to be replaced on a regular basis).
Course (of Fire)	The programmed set of actions for each shooting target.
Edge	The side of the shooting target (not face or back).
Error / Warning / Alarm	A minor problem with the system, but the system will still run.
Exposure Times	The amount of time the face (not the edge) will be positioned toward the shooter.
Fault	A major problem with the system. The system will not run.
HMI	A human-machine interface, which is a feature of any device that enables humans to engage and interact with machines. Common examples include touchscreens and keyboards.
Loctite	A brand of adhesives that is used to prevent loosening of metal fasteners caused by vibrations.
PLC	A programmable logic controller, which is a computer control system, that controls other devices based on various information available to it.
Range Master	The person in charge of any given session.
Stage	A step in the Course (of Fire).

SYMBOL	DEFINITION
	Power (On/Off).
	Ethernet LED. Will light steady when an active Ethernet connection is made and flash when there is activity.
	Signal Strength.
	Caution.
	Risk of Electrical Shock.
	Risk of Hot Surface.
	Grounding Point/Terminal.
	Ethernet POE Port. Do not plug non-POE powered devices into this port on the POE Injectors.



THE PINNACLE OF SHOOTING RANGES™