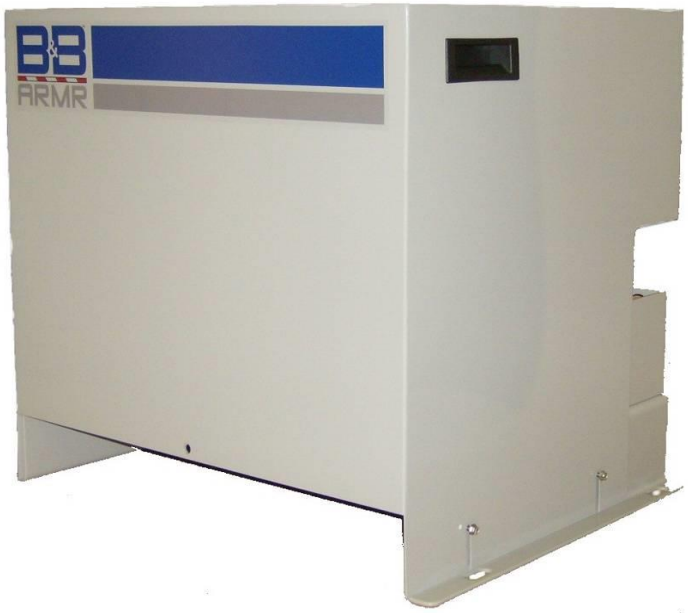
LXL Series Hydraulic Slide Gate Operators

OPERATIONS & MAINTENANCE MANUAL



Model No.:_____

Serial No.: _____

B&B ARMR

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MADE IN THE USA

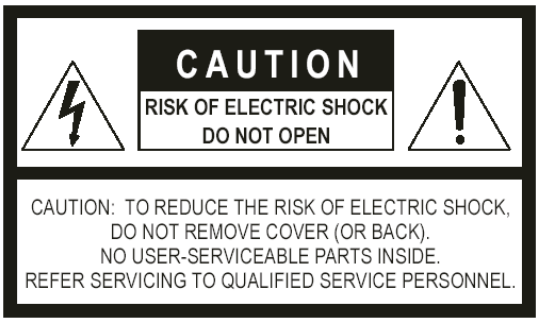
Your safety is extremely important to us. If you have any questions or are in doubt about any aspect of the equipment, please contact us.

Introduction

Welcome!

Congratulations on your purchase of a B&B ARMR gate operator. In addition to providing detailed operating instructions, this manual describes how to install, maintain, and troubleshoot your operator. If you require additional assistance with any aspect of installation or operation, please contact us.

Safety



SYMBOL MEANING:

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of non insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the product.

Important Safety Information

TO REDUCE THE RISK OF SERIOUS INJURY OR DEATH, READ AND FOLLOW ALL INSTRUCTIONS PROVIDED IN THIS MANUAL.

1. Hydraulic slide gate operators are intended for vehicular use only. Pedestrians should use a separate walkthrough entrance designed for on-foot traffic.
2. Keep children away from gate movement area and off the gate operator. Never let children operate or play with gate controls.
3. Install all warning signs provided with the gate operator so that they are clearly visible from both sides of the gate.
4. It is the responsibility of the specifier, designer, purchaser, installer and end-user to ensure the gate system is properly configured for its intended application.
5. Use the emergency manual release only when the gate is not in motion.
6. Test gate operator and all related safety devices monthly. The gate must reverse or stop when a safety device is tripped. The gate must stop upon sensing a second sequential safety violation before reaching a limit switch. If the gate utilizes a transmitting device on a safety edge, check the battery on a regular basis to ensure proper operation. Failure to adjust and re-test the gate operator properly can increase the risk of injury.
7. This gate operator utilizes a pumping system which contains hydraulic fluid. Consult local EPA (Environmental Protection Agency) regulations for damming requirements (if any) around the base of the gate operator.
8. Service and maintenance of the gate operator should be performed on a routine basis by a qualified technician. Attempts to service the gate equipment by non-qualified personnel could result in serious injury and will void all applicable warranties.

SAVE THESE INSTRUCTIONS.

THIS MANUAL SHOULD BE LEFT WITH A RESPONSIBLE INDIVIDUAL AT THE INSTALLATION SITE AND KEPT IN A DESIGNATED LOCATION FOR MAINTENANCE OR TROUBLESHOOTING OPERATIONS

How to Contact Us

If you have any questions or experience any problems with your vehicle barrier—or if we can help you with any other facility security issues—please contact us directly at:

Corporate/Tech Support:
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2009 Chenault Drive Suite 114
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Telephone: (972) 385-7899
Toll Free: (800) 367-0387
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techsupport@bb-armr.com

Table of Contents

1. UL 325 And Gate Operators

1.1 What Is UL?

Underwriters Laboratories, Inc., a non-profit organization established in 1894, is self-described as "the leading third-party certification organization in the United States and the largest in North America." UL's primary stated mission is "to evaluate products in the interest of public safety." Note that while UL declares it is the "leading" third-party certification, it is not the only one. There are other testing laboratories and certification organizations in the United States.

1.2 Development Of UL-325

The first edition of UL-325 was released in 1973. That edition was primarily focused on the electric operation of garage doors and did not contain provisions for gates. After federal laws were enacted in the early 1990's, citing the provisions of UL-325 as applicable to garage door operation, DASMA members of the gate operator industry initiated the inclusion of electric gate operator provisions in UL-325. Some government agencies and other interested groups have monitored the standard's progress and have provided input on the final format of the provisions of the standard that relate to gate operators.

1.3 Overview Of UL-325 And Gates

Highlights of UL-325 include the following:

- A glossary which defines each type of operator
- Different "classes" of gate operators
- Entrapment[1] protection criteria for each "class" of operator
- Entrapment alarm criteria
- Requirements for gate construction and installation
- Instructional requirements placing increased responsibility on installers

A key part of the UL-325 standard is a table that summarizes the entrapment device options for different classes of operators of the various types of gates included in the standard. The table, labeled "Table 31.1", is reproduced here from the 5th edition of the *Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems, UL-325*. It is reprinted with the permission of Underwriters Laboratories, Inc. Refer to the table as you read about the provisions that are described in the following sections.

1. In this document, "entrapment" is defined as "the condition when an object is caught or held in a position that increases the risk of injury."

PROTECTION AGAINST ENTRAPMENT

VEHICULAR USAGE CLASS	GATE OPERATOR CATEGORY			
	Horizontal Slide VERTICAL LIFT VERTICAL PIVOT		SWING GATE VERTICAL BARRIER (ARM)	
	PRIMARY TYPE	SECONDARY TYPE	PRIMARY TYPE	SECONDARY TYPE
Class I & II	A	B1,B2 or D	A or C	A,B1,B2,C or D
Class III	A,B1 or B2	A,B1,B2,D or E	A,B1,B2 or C	A,B1,B2,C,D or E
Class IV	A,B1,B2 or D	A,B1,B2,D or E	A,B1,B2,C or D	A,B1,B2.C,D or E

NOTE: The same type of device shall not be utilized for both the primary and secondary entrapment protection means. Use of a single device to cover both the openings and closing directions is in accordance with this requirement; however, a single device is not required to cover both directions. A combination of one Type B1 for one direction and one Type B2 for the other direction is the equivalent of one device for the purpose of complying with the requirements of either the primary or secondary entrapment protection means. Entrapment protection types:

Type A - Inherent entrapment sensing system. See 31.1.5

TypeB1 - Provision for connection of, or supplied with, a non-contact sensor (photoelectric sensor or the equivalent). See 31.1.6-31.1.9.

Type B2 - Provision for connection of, or supplied with, a contact sensor (edge device or equivalent). See 31.1.7 and 31.1.10 - 31.1.12.

Type C - Inherent adjustable clutch or pressure relief device. See 31.1.13.

Type D - Provision for connection of, or supplied with, an actuating device requiring continuous pressure to maintain opening or closing motion of the gate. See 31.1.14 and 31.1.15.

Type E - An inherent audio alarm. See 31.1.16, 31.1.17 and 31.1.18.

This table is re-created from the 5th edition of the Standard for Safety for door, drapery, gate, louver, and Window Operators and Systems, UL-325, and is reprinted with permission of Underwriters Laboratories, Inc.

1.4 Gate Operator Classifications

Four distinct types of classifications have been established:

- Class I: Residential usage, covering one to four single-family dwellings.
- Class II: Commercial usage where general public access is expected; a common application would be a public parking lot or gated community.
- Class III: Industrial usage where limited access is expected; one example is a ware- house property entrance not intended to serve the general public.
- Class IV: Restricted access; this includes applications such as a prison entrance that is monitored either in person or via closed circuit television.

Gate speed shall be no greater than 1 foot per second in Class I and II applications.

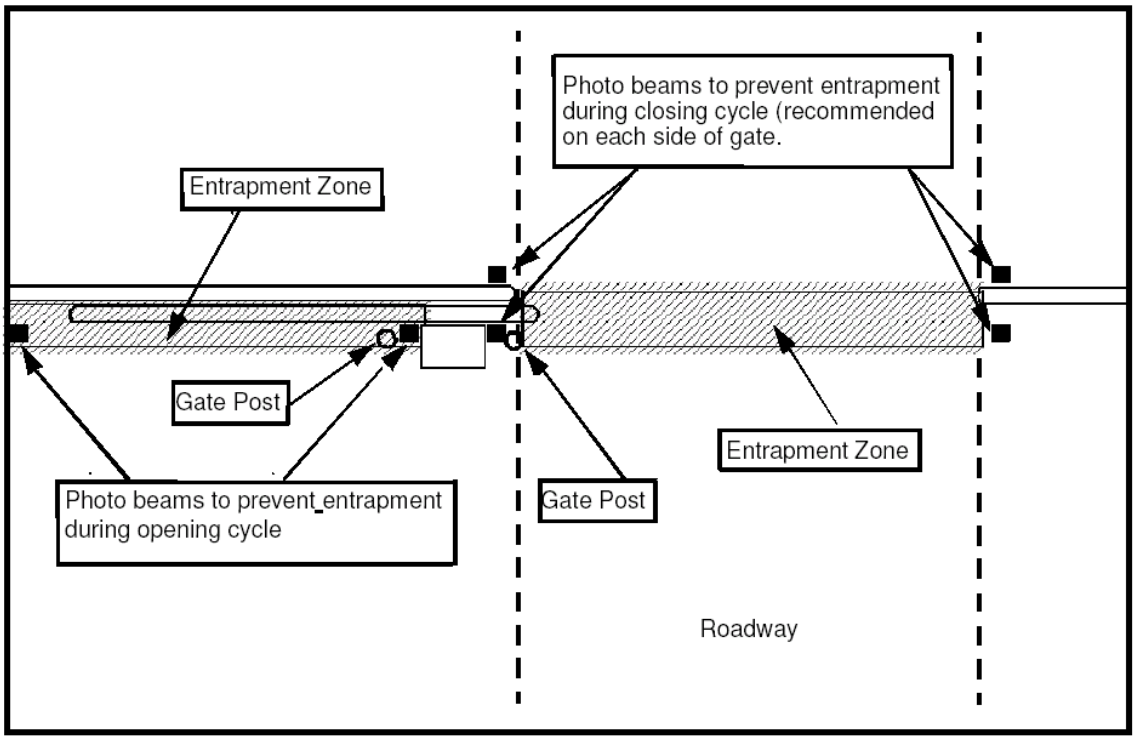


Figure 1 Non-Contact Sensor Detail

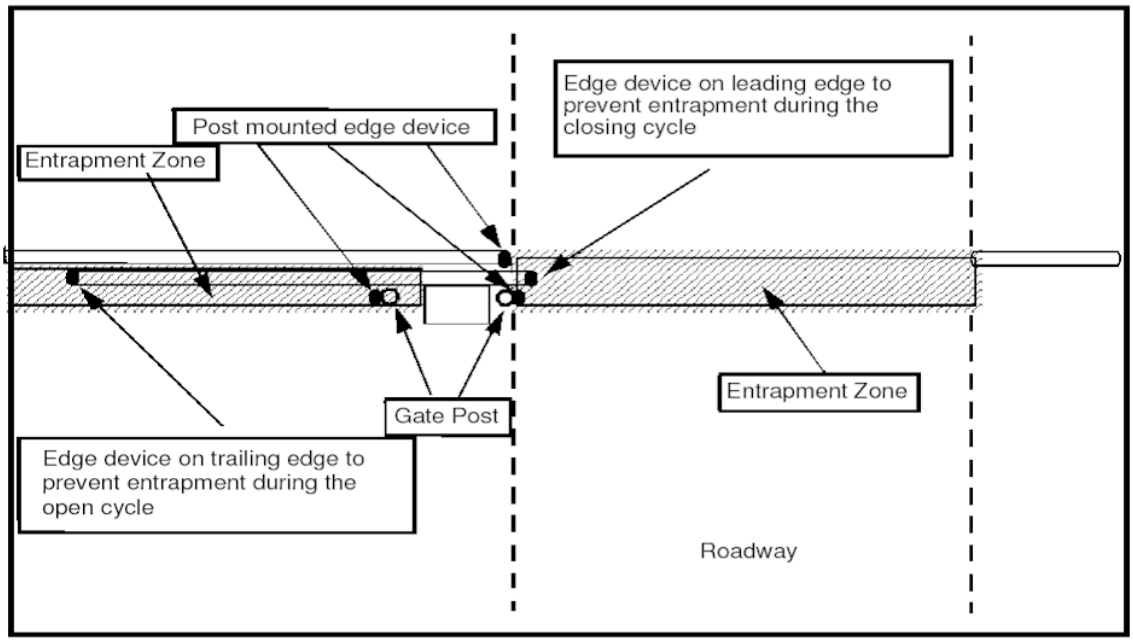


Figure 2 Contact Sensor Detail

2. LXL Operator Models And Features

2.1 General Description

B&B ARMR's model LXL hydraulic sliding gate operator is designed to reliably operate many styles of sliding gates, including overhead track, ground track, and cantilever style gates. Our LXL series of operators are designed to operate in all four UL-325 classes of operators. The operator is unobtrusive in appearance, yet durable under heavy use. The design of the LXL Series incorporates numerous features intended to improve safety, maintain security, increase reliability and reduce maintenance.

The operator actuates the gate by two rotating wheels (the LXLR uses an idler wheel and pinion gear). A drive rail bolted to the gate is drawn between the two drive wheels. The wheels are spring loaded against the drive rail to produce a positive friction feed in both directions. Spring loading the wheels also serves to correct for wheel wear. The drive wheels are rotated by series-connected hydraulic motors to minimize uneven rotation between the wheels.

Rotation direction is determined by the hydraulic valve system, not by the rotational direction of the electric motor. Independence from the electric motor rotation has the advantage that the direction of gate travel can be instantly reversed without the use of brakes. Also, the hydraulic valve, when not energized, rests in the neutral position. This effectively locks the hydraulic system, drive wheels, and the gate in the stopped position. Controls operate on safe and reliable 24VDC regulated voltage.

2.2 LXL Operator Features

The LXL hydraulic slide gate operator incorporates the following features and options:

- Designed to meet UL-325 Class I-IV.
- Inherent entrapment sensing on all units
- Simple user interface utilizes a 12x4 character LCD display
- User-Programmable right-hand to left-hand conversion; no hose swapping required
- Delay on reverse standard
- 24VAC and 24VDC auxiliary control power
- Low maintenance - No sprockets, chains, or pulleys to adjust
- Built-in, fully adjustable maximum run and auto close timers
- Soft start / soft stop (option)
- Plug-in loop detectors (option)
- Hand-operated, quick release drive system for manual operation
- Master/slave capability
- Interlocking capability
- Proximity limit switches eliminate false tripping due to misaligned drive rail

2.3 Models Available

NOTE: To order any of the LXL models, substitute the required input voltage for the "v" and the required input phase for "p".

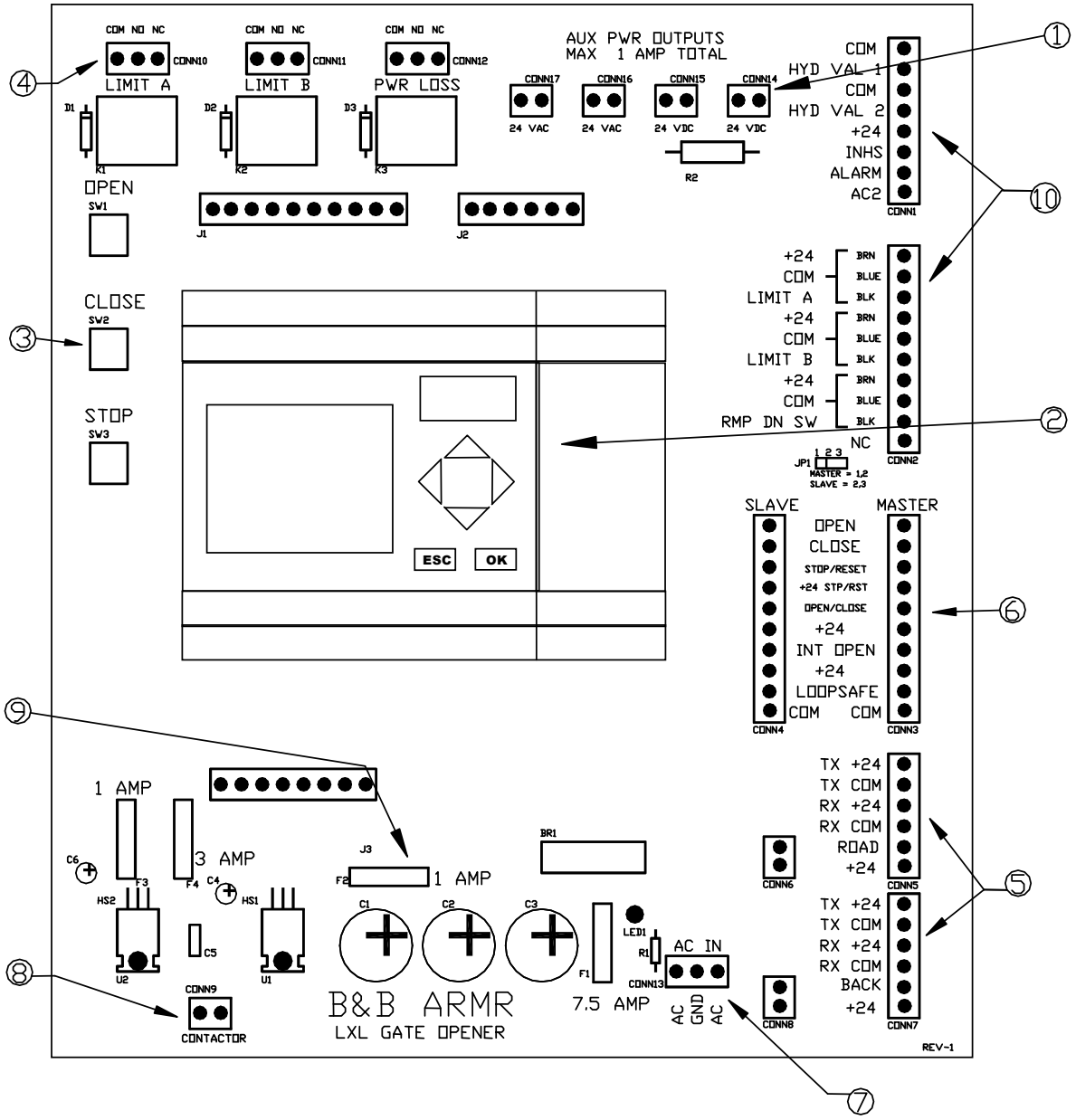
Typical Available Models	Travel Speed	Gate Size	Pull Force	UL Class
LXL-15vp-SS Standard Speed	1.0 ft/s	2,000 lbs	400 lbs	I-IV
LXL-15vp-HS High Speed	2.0 ft/s	1,000 lbs	300 lbs	III & IV
LXL-20vp-HD Heavy Duty	1.0 ft/s	3,000 lbs	600 lbs	I-IV
LXLR-15vp-SS Rack & Pinion	1.0 ft/s	3,000 lbs	350 lbs	I-IV
LXLR-20vp-HD Rack & Pinion	1.0 ft/s	4,700 lbs	450 lbs	I-IV
LXLB-13vp-SS Battery Back-up	1.0 ft/s	2,000 lbs	350 lbs	I-IV
LXLB-13vp-HS Battery Back-up High Speed	1.0 ft/s	1,000 lbs	350 lbs	III & IV
LXLD-20vp-SS Extra Heavy Duty	0.8 ft/s	20,000 lbs	1,700 lbs	I-IV
LXLT-30vp-SS Extreme Heavy Duty	0.8ft/s	25,000 lbs	1,800 lbs	III-IV

a. Travel speed on all operators limited to 1 foot per second in Class I and II applications.

Other models for extra heavy-duty operation are available for extremely long and heavy gates. Contact your local distributor or the factory for more information.

3.

4. The LXL Interface Board



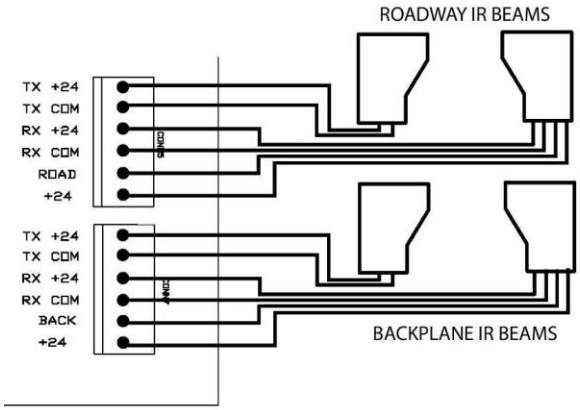
1 24VAC/24VDC auxiliary power
2 Processor/Controller
3 Built-in 3 button station
4 Position indication and power loss relays
5 Secondary safety device connections
6 Control inputs (open devices, safety loops, etc.)

7 Input power for control board
8 Contactor output
9 1 amp fuse (processor protection)
10 Factory connections

5. Secondary Safety Devices

Connecting safety devices to the secondary safety connectors will stop the gate on the detection of the safety and proceed in the event of clearing the safety. To reverse the gate on the event of a safety, you must connect the safety device to the loopsafe terminal on connector 3.

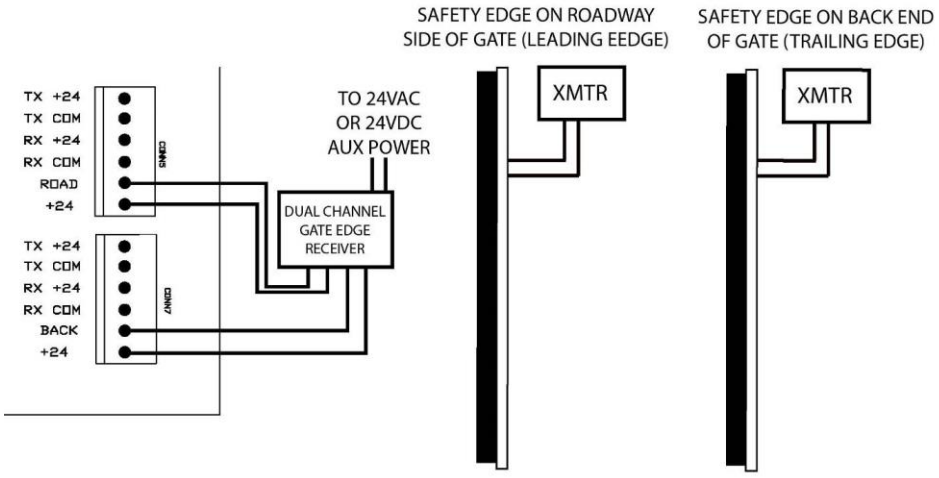
INFRARED BEAMS



IMPORTANT NOTE:
UL 325 approved secondary safety devices MUST be used for the gate installation to comply with the requirements of UL 325.

Refer to the UL approved manufacturer's documentation for proper installation of secondary safety devices.

SAFETY EDGES



*Note: The ROAD and BACK connections are normally open connections

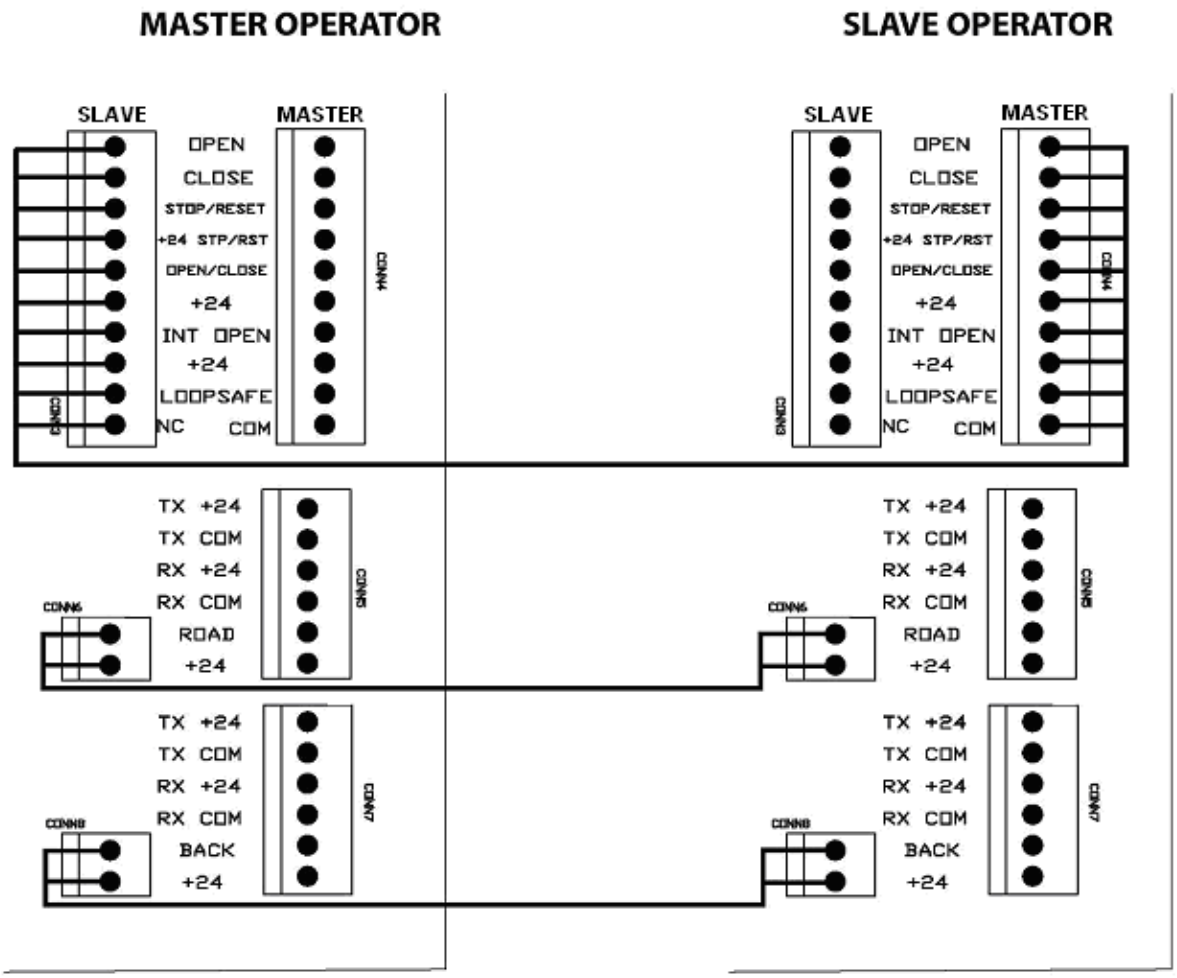
UL Approved Secondary Safety Devices:

Miller Edge - manufacturer of contact sensors for all types of gates (800-220-EDGE).
website: http://www.milleredge.com

EMX Industries - manufacturer of non-contact sensors for gates (800-426-9912).

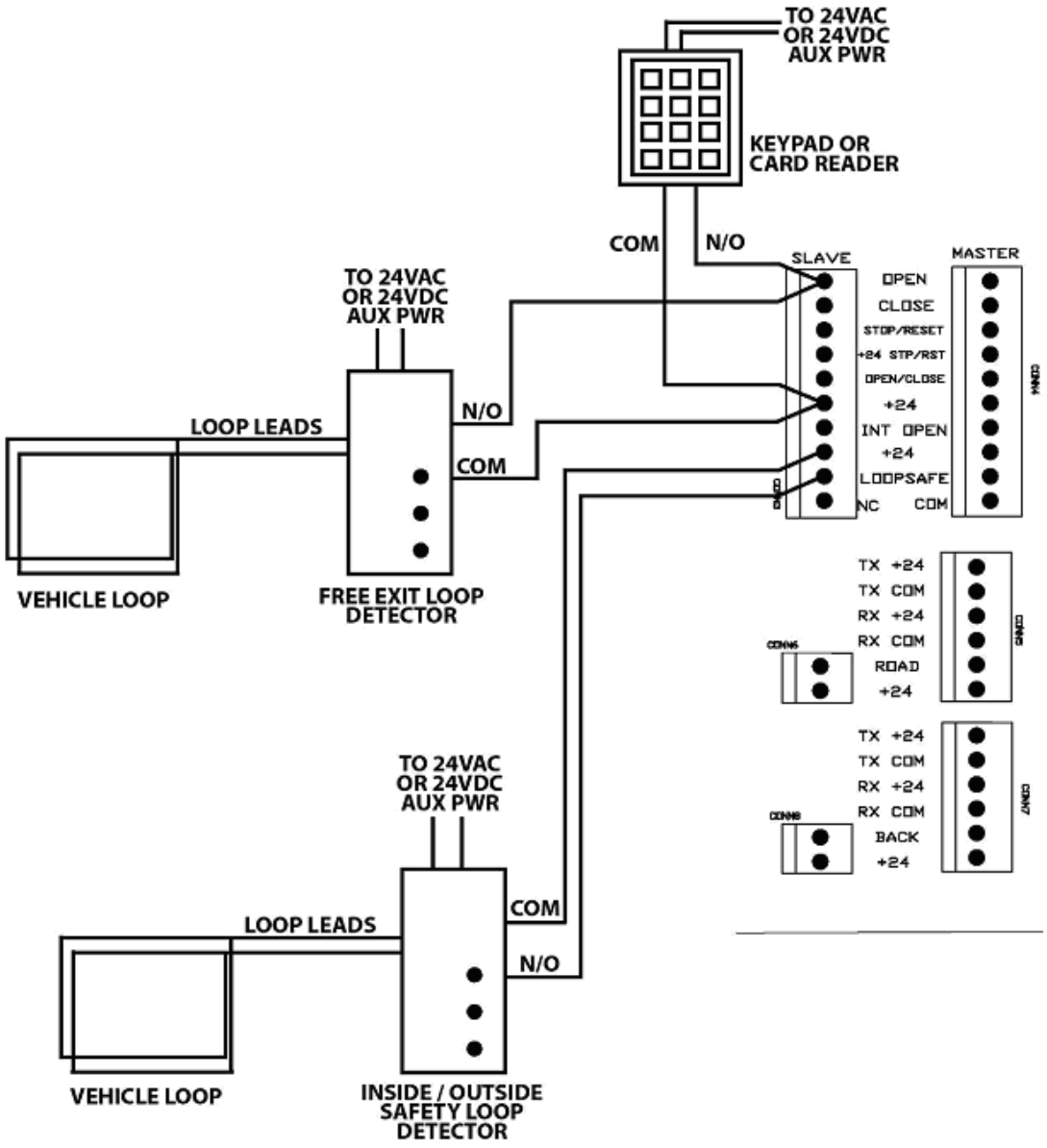
website: http:// www.emxinc.com

6. Master Slave Connections



- 10 conductors required for master / slave connection between operators (16-18 gauge wire), plus 4 for safety devices
- Each operator must be programmed separately
- Secondary safety devices must be connected to their respective operators for proper operation, and to ensure UL 325 compliance

7. Other Device Connections



8. Maintenance

Here is a list of items that should be checked on a routine basis.

1.1 Hardware / Drive Wheels

- **Check for normal wheel wear -** Look for cracks or pieces of the wheel tread that may have worn or broken off. The drive wheels require periodic replacement under normal service when the wheels become out-of-round or have cracked. Over tightening of the wheel clamping spring will shorten the wheel life.
- **Check for loose or broken fasteners -** This check should also include the fasteners on the gate panel. A broken fastener on the gate panel could cause undue stress on the operator. Also, inspect the anchor bolts that hold the gate operator in position. While inspecting these bolts, check for signs the operator has "walked" out of its original mounting position
- **Cycle test the operator -** Run the gate through several cycles to confirm that there is no binding of the gate panel and that the drive rail is properly aligned with the gate operator. Also, monitor the wheels for slippage. If the wheels slip, tighten down on the spring adjustment nut until no slippage occurs during normal gate travel. Tighten the spring only enough to eliminate slippage during normal travel.

1.2 Hydraulic System

- **Remove the vent cap and check the hydraulic fluid level** -The vent cap is located on the reservoir assembly (bottom right of the operator). After removing the vent plug, a visual inspection should show the fluid level no more than 1" below the vent plug. If fluid needs to be added, use Envirologic EL132 hydraulic fluid. Other available hydraulic fluids are:
  Texaco Aircraft Oil #15
  Mobil DTE 24

IMPORTANT NOTE: All B&B ARMR operators ship with Envirologic EL132 hydraulic fluid. If another hydraulic fluid is substituted; the existing fluid must be drained to avoid mixing. Never mix hydraulic fluids!

- **Check for leaks in the hydraulic system -** This includes the hydraulic lines, reservoir and fittings. Leakage may occur in the fittings after a period use. If this happens, moderate tightening of the hose fittings should stop the leakage. If the leak persists, replace the leaking hose assembly.

1.3 Electronic Components

- **Check for loose or frayed wires -** Carefully inspect all input and output connections to ensure all wires are seated properly in the terminal blocks. A loose or frayed wire can create different "phantom" problems.

- **Check gate input devices for proper operation -** These devices include push buttons, keypads, loops, etc. An improperly functioning input device could give the impression the gate operator is malfunctioning.

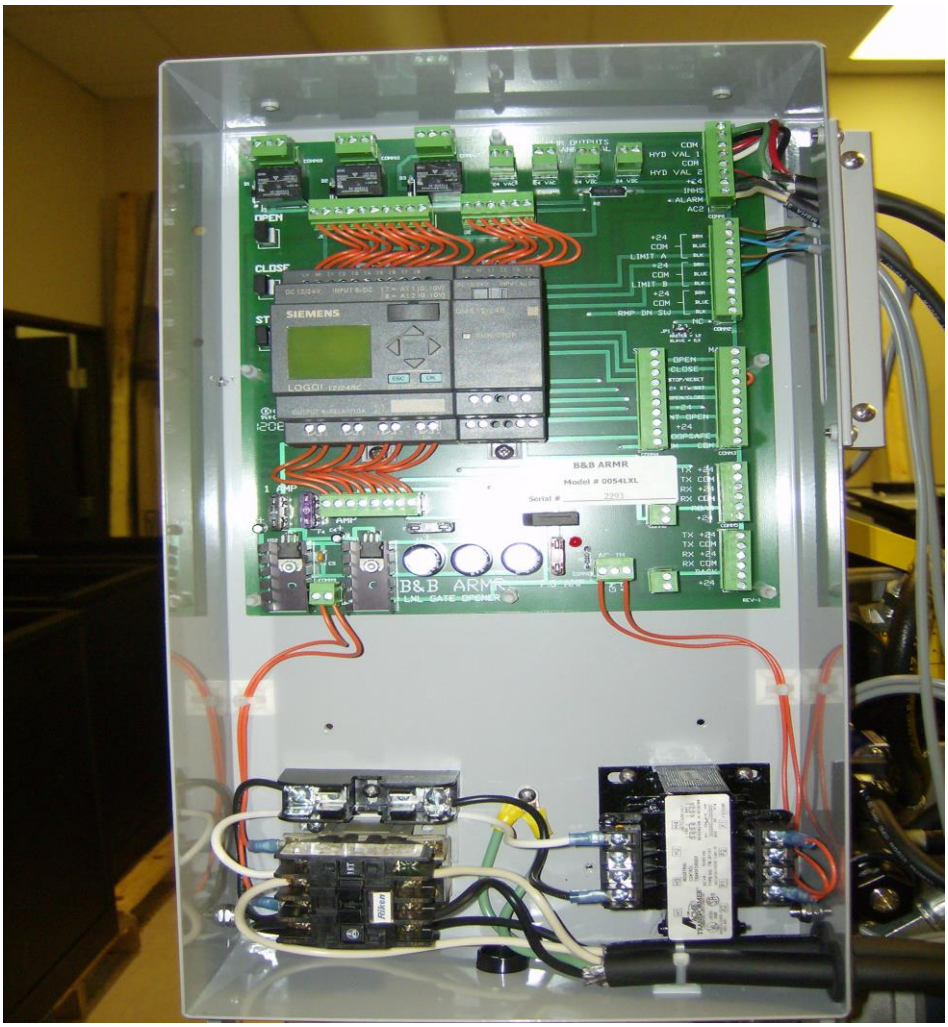
- **Test all safety devices for proper operation -** Test the inherent safety to ensure the gate reverses after coming in contact with an obstruction. Adjust the hydraulic pressure by following step 12 in the *Installation and Programming* section of this manual.

9. Appendix

** Note: There are some changes in the drawing below. Standard speed setup is shown. For high speed and rack and pinion users please note that these item numbers are different:

Number 31 will be XHYD-103-1572 for standard and high speed units
Number 31 will be 0050-RS-1001010 for rack and pinion units
Number 9 will be XHYD-M406-0103 for high speed units

*Also, note for electrical components such as transformers or motors your voltage and phase may change the part number required

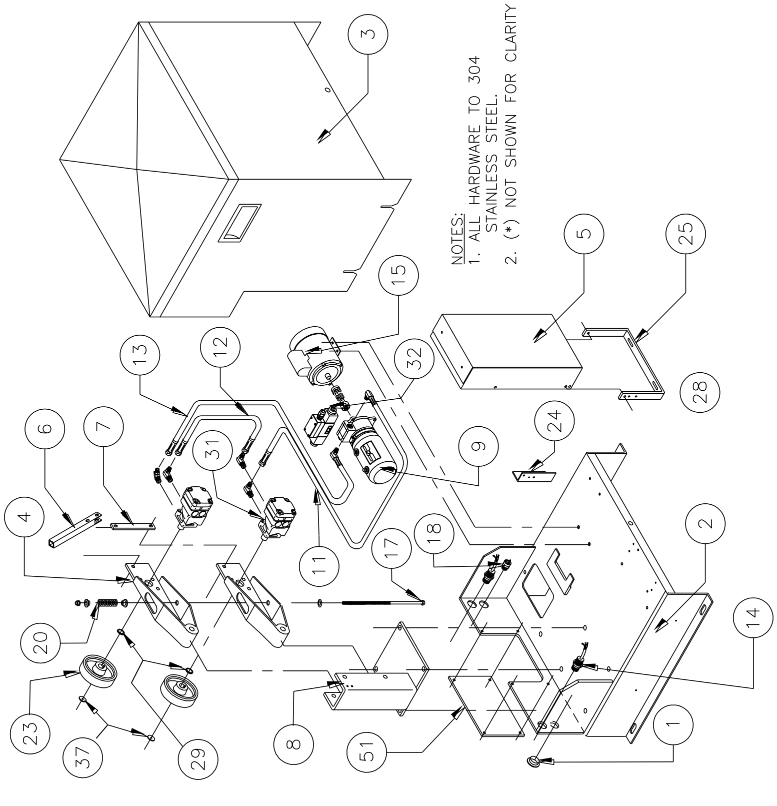


LXL electrical cubical

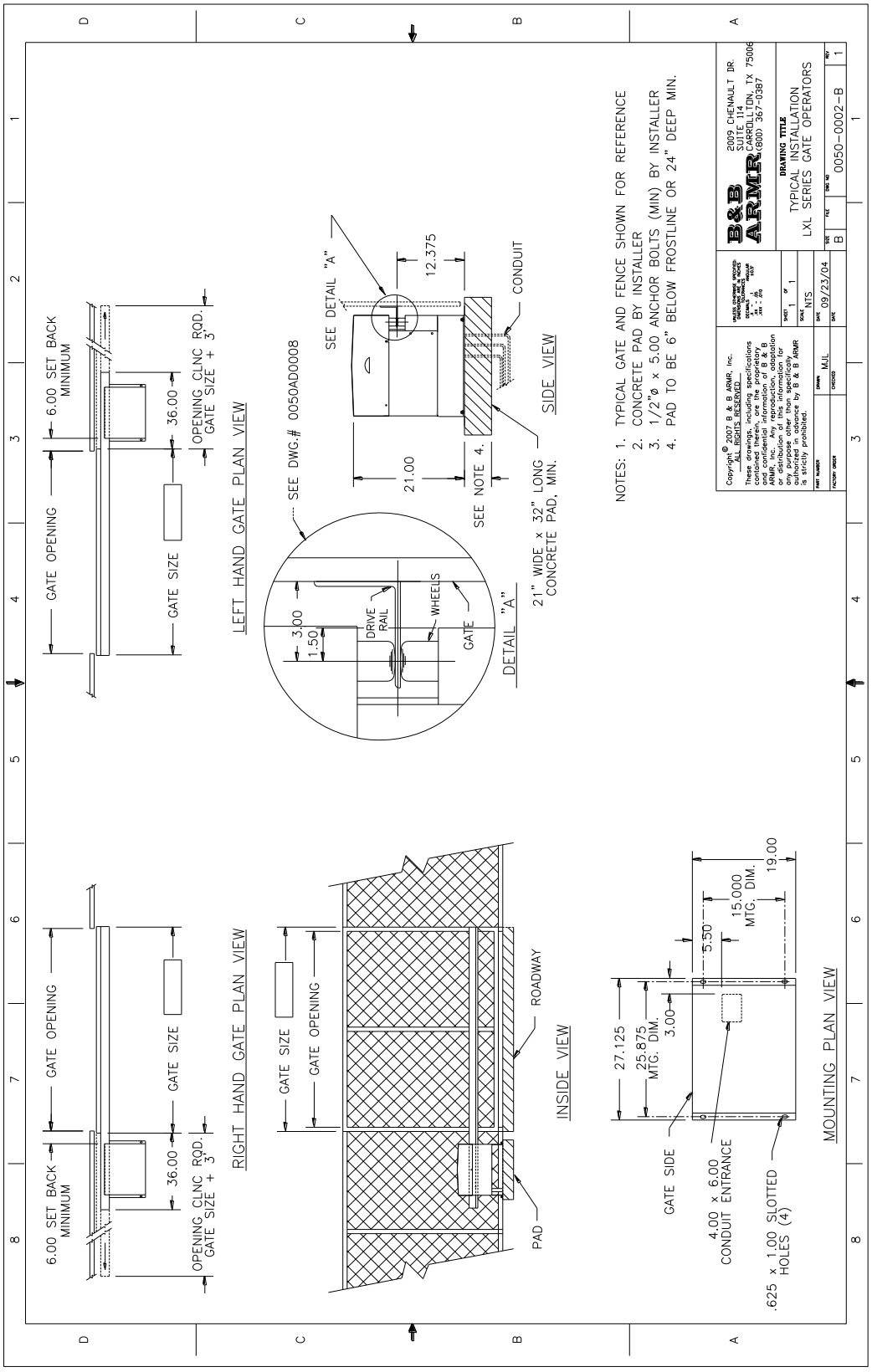
1.4 General Parts Breakdown

	ITEM NO	QTY	PART OR IDENTIFYING NO	DESCRIPTION	DRAWING NUMBER – MATERIAL DESCRIPTION	
	51	4	0054-0540	WHEEL COVER, BASE	0050-0540-C	1
*	50	1	XWASH-94709A416	SS WASHER WITH NEOPRENE BACKING	EA, STAINLESS W/ NEOPRENE BACKING	4
*	49	1	XTRANS-MSP300	TRANSDUCER	EA, PRESSURE/NO CABLE	1
*	47	1	XSWI-KG2	SWITCH, 3 PHASE	EA, MAIN DISCONNECT	1
*	46	1	XSWI-KG1	SWITCH, 1 PHASE	EA, MAIN DISCONNECT	1
*	45	1	0054-LXLBOARD	CIRCUIT BOARD	EA, CIRCUIT BOARD, WITH PLC	1
*	44	2	XNUT-FINGER	NUT	EA, FINGER TYPE, BRASS	2
	37	2	XWASH-25N150WFEZ	1/4X1-1/2 THK FENDER WASHER	EA, .108-.132 THICK PLATED STEEL	2
*	36	1	0054-0512	COVER, VOLTAGE	0054-0512-C	1
	35	2	0054-0513	THIMBLE, ARM MOUNT	0054-0513-B	2
	34	1	0054-0515	SPACER, SPRING	0054-0515-C	1
*	33	1	0000-0520	NAMEPLATE	EA, ALUMINUM	1
*	32	1	XHYD-VALVE-DC	VALVE	EA, SOFT STOP SHIFT, 24 VDC	1
	31	2	XHYD-MTR08-OR	HYD. MOTOR	EA, MODEL RS08	2
*	30	1	0054-0511	WIRE CLAMP ASSEMBLY	0054-0511-A	1
	29	2	0050-H24569	WASHER	EA, 1.015 PLATED STEEL	2
	27	1	0050-LC-112M-7	SPRING	EA, 1.095 X 4 LONG	1
	26	2	XPUSH-98404A005	SELF-LOCKING PUSH PIN	EA, .188" X .500 LONG	2
	25	1	0054-0508	MOUNTING BRACKET	0054-0508-C	–
*	24	1	0054-0509	REST ANGLE	0054-0509-D	–
*	23	2	0050-6X1.5UR	WHEEL, BLACK	EA, 1.00 BORE	2
	20	1	XSPR-LHL1250C-9	SPRING	EA, 1.25 X 5.00 LONG	1
*	19	1	0054-0514	PLUNGER HEAD	0054-0514-B	1
	18	1	XALM-SC628AN	ALARM	EA, MALLORY, SC628AN	1
	17	1	110-08120C-C	BOLT	EA, .500-13 X 12"	1
*	16	1	1003-150-2/4	MOTOR, 220/460VAC 3PH	EA, PER INSTALLATION	1
	15	1	1001-150-1/2	MOTOR, 120/220VAC 1PH	EA, PER INSTALLATION	1
	14	2	XSWI-P&FNBB15	SWITCH	EA, 30MM PROX	2
	13	1	XHYD-HOSE-LXL-3	TOP FEEDER HOSE	0054-0519-A	–
	12	1	XHYD-HOSE-LXL-2	JUMPER HOSE	0054-0518-A	–
	11	1	XHYD-HOSE-LXL-1	FEEDER HOSE	0054-0517-A	–
*	10	1	XHYD-M406-0103	PUMP, HIGH SPEED	EA, 2000 PSI, 6X6 RES	1
	9	1	XHYD-M406-0105	PUMP, STANDARD SPEED	EA, 2000 PSI, 6X6 RES	1
	8	1	0054-0504	MOTOR MAST ASSEMBLY	0054-0504-B	–
	7	1	0050-0655	LEVER CONNECTING LINK	0050-0655-D	–
	6	1	0054-0506	LEVER, MANUAL RELEASE	0054-0506-B	–
	5	1	0054-0523/FAB	ELECTRICAL BOX W/ LID	0054-0523-A	–
	4	2	0054-0503	MOUNT, HYD. MOTOR, LXL	0054-0503-A	–
	3	1	0054-0502	COVER, LXL	0054-0502-D	–
	2	1	0054-0501	BASE	0050-0501-H	–
	ITEM	QTY	P/N	DESCRIPTION	DRAWING/MATERIAL	

PARTS LIST



Typical Installation


NOTES: 1. TYPICAL GATE AND FENCE SHOWN FOR REFERENCE
2. CONCRETE PAD BY INSTALLER
3. 1/2"ø x 5.00 ANCHOR BOLTS (MIN) BY INSTALLER
4. PAD TO BE 6" BELOW FROSTLINE OR 24" DEEP MIN.
LEFT HAND GATE PLAN VIEW
RIGHT HAND GATE PLAN VIEW
SIDE VIEW
INSIDE VIEW
DETAIL "A"
MOUNTING PLAN VIEW
GATE OPENING
GATE SIZE
6.00 SET BACK MINIMUM
36.00
OPENING CLNC RQD. GATE SIZE + 3"
SEE DETAIL "A"
SEE DWG.# 0050AD0008
SEE NOTE 4.
21" WIDE x 32" LONG CONCRETE PAD, MIN.
CONDUIT
ROADWAY
PAD
DRIVE RAIL
WHEELS
GATE
3.00
1.50
12.375
21.00
27.125
25.875 MTG. DIM.
3.00
5.50
15.000 MTG. DIM.
19.00
GATE SIDE
4.00 x 6.00 CONDUIT ENTRANCE
.625 x 1.00 SLOTTED HOLES (4)
B&B ARMR
2009 CHENAULT DR. SUITE 114
CARROLLTON, TX 75006
(800) 367-0387
DRAWING TITLE
TYPICAL INSTALLATION
LXL SERIES GATE OPERATORS
0050-0002-B
09/23/04
M.J.L.
NTS
SHEET 1 OF 1
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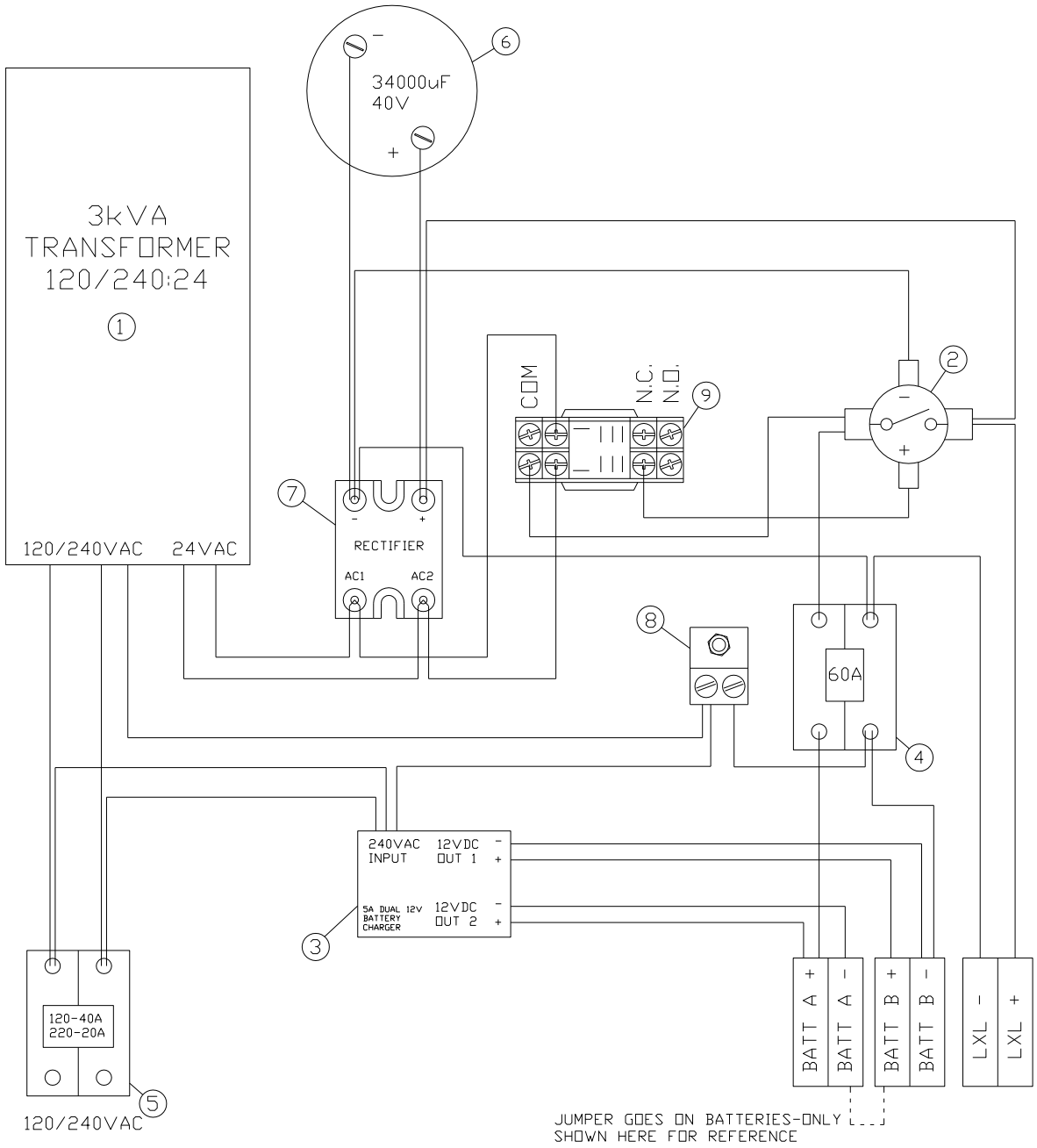
1.5 Battery Backup Schematic



NOTES:
1. ONLY BATT B (-) TERMINAL IS TIED TO EARTH GROUND (NOT BATT A)
2. JUMPER BETWEEN 2-12V BATTERIES IS ON BATTERIES

Battery backup Parts List

ITEM	QTY	B&B ARMR #	DESCRIPTION
1	1	XTRAN-416-1181	3KVA TRANSFORMER
2	1	XSOL-124-114111	24VDC SOLENOID
3	1	XCHGR-CT500-3	230V 3A BATTERY CHARGER
4	1	XBRKR-QOU260	60A CIRCUIT BREAKER
5	1	XBRKR-QOU220 XBRKR-QOU240	20A CIRCUIT BREAKER (FOR 240V) 40A CIRCUIT BREAKER (FOR 120V)
6	1	XCAP-34000/40	34000uF CAPACITOR
7	1	YR838-M50100SB	100A RECTIFIER
8	1	XLUG-LAM2A1/0	GROUND LUG
9	1	XRLY-2W929	24vac RELAY

DRAWING: ± 0.5 015

DRWN: M. Heuer Sept. 19 2006

ENGR:

PART: 0054-2019

B&B ARMR

BATTERY BACKUP UNIT
LXLB, PXLB, NXLB

SIZE B | FSCM NO. | DWG NO: XLBBU-CT-MAN | REV. B

SCALE: ——— | DO NOT SCALE PRINT | SHEET 1 OF 1

1 ? Power Wiring

HP	Voltage	Wire		Single	Dual
	Amps	Gage	mm^2	Operator	Operators
1/2	115 V	12	3.309	80	40
	7.5 A.AC	10	5.261	130	65
		8	8.366	210	105
		6	13.302	340	170
1/2	208 V	12	3.309	290	145
	3.9 A.AC	10	5.261	460	230
		8	8.366	740	370
		6	13.302	1180	590
1/2	230 V	12	3.309	340	170
	3.7 A.AC	10	5.261	540	270
		8	8.366	860	430
		6	13.302	1380	690
1	115 V	12	3.309	50	25
	12 A.AC	10	5.261	80	40
		8	8.366	130	65
		6	13.302	220	110
1	208 V	12	3.309	180	90
	6.4 A.AC	10	5.261	290	145
		8	8.366	470	235
		6	13.302	750	375
1	230 V	12	3.309	220	110
	6 A.AC	10	5.261	350	175
		8	8.366	550	275
		6	13.302	880	440
1 1/2	115 V	12	3.309	40	20
	15 A.AC	10	5.261	70	35
		8	8.366	110	55
		6	13.302	180	90
1 1/2	208 V	12	3.309	140	70
	8.3 A.AC	10	5.261	230	115
		8	8.366	370	185
		6	13.302	580	290
1 1/2	230 V	12	3.309	170	85
	7.5 A.AC	10	5.261	280	140
		8	8.366	450	225
		6	13.302	720	360
2	208 V	12	3.309	90	45
	13.2 A.AC	10	5.261	140	70
		8	8.366	230	115
		6	13.302	370	185
2	230 V	12	3.309	110	55
	12 A.AC	10	5.261	180	90
		8	8.366	280	140
		6	13.302	460	230
3	208 V	12	3.309	60	30
	18.7 A.AC	10	5.261	100	50
		8	8.366	160	80
		6	13.302	260	130
3	230 V	12	3.309	80	40
	17 A.AC	10	5.261	120	60
		8	8.366	200	100
		6	13.302	320	160

3 ? Power Wiring

HP	Voltage	Wire		Single	Dual
	Amps	Gage	mm^2	Operator	Operators
1/2	208 V	12	3.309	510	255
	2 A.AC	10	5.261	820	410
		8	8.366	1310	655
		6	13.302	2080	1040
1/2	230 V	12	3.309	580	290
	2 A.AC	10	5.261	920	460
		8	8.366	1470	735
		6	13.302	2340	1170
1/2	460 V	12	3.309	2330	1165
	1 A.AC	10	5.261	3700	1850
		8	8.366	5900	2950
		6	13.302	9390	4695
1	208 V	12	3.309	320	160
	3.5 A.AC	10	5.261	510	255
		8	8.366	810	405
		6	13.302	1290	645
1	230 V	12	3.309	390	195
	3.2 A.AC	10	5.261	620	310
		8	8.366	980	490
		6	13.302	1570	785
1	460 V	12	3.309	1560	780
	1.6 A.AC	10	5.261	2480	1240
		8	8.366	3950	1975
		6	13.302	6290	3145
1 1/2	208 V	12	3.309	190	95
	6.2 A.AC	10	5.261	300	150
		8	8.366	480	240
		6	13.302	770	385
1 1/2	230 V	12	3.309	230	115
	5.6 A.AC	10	5.261	370	185
		8	8.366	590	295
		6	13.302	940	470
1 1/2	460 V	12	3.309	940	470
	2.8 A.AC	10	5.261	1490	745
		8	8.366	2380	1190
		6	13.302	3790	1895
2	208 V	12	3.309	90	45
	6.2 A.AC	10	5.261	140	70
		8	8.366	230	115
		6	13.302	370	185
2	230 V	12	3.309	110	55
	5.6 A.AC	10	5.261	180	90
		8	8.366	280	140
		6	13.302	460	230
2	460 V	12	3.309	150	75
	2.8 A.AC	10	5.261	230	115
		8	8.366	370	185
		6	13.302	600	300

3 ? Power Wiring (Continued)

HP	Voltage	Wire		Single	Dual
	Amps	Gage	mm^2	Operator	Operators
3	208 V	12	3.309	150	75
	7.8 A.AC	10	5.261	240	120
		8	8.366	390	195
		6	13.302	620	310
3	230 V	12	3.309	180	90
	7.4 A.AC	10	5.261	280	140
		8	8.366	450	225
		6	13.302	730	365
3	460 V	12	3.309	720	360
	3.7 A.AC	10	5.261	1150	575
		8	8.366	1830	915
		6	13.302	2920	1460
5	208 V	12	3.309	90	45
	15 A.AC	10	5.261	140	70
		8	8.366	230	115
		6	13.302	370	185
5	230 V	12	3.309	110	55
	13.2 A.AC	10	5.261	180	90
		8	8.366	280	140
		6	13.302	460	230
5	460 V	12	3.309	150	75
	6.6 A.AC	10	5.261	230	115
		8	8.366	370	185
		6	13.302	600	300

Control Wiring

Voltage	Wire		Max	Voltage
	Gage	mm^2	Distance (ft)	Drop
24 V	28	0.081	450	6V
24 V	26	0.129	710	6V
24 V	24	0.205	1140	6V
24 V	20	0.518	2890	6V
24 V	18	0.823	4600	6V

Notes

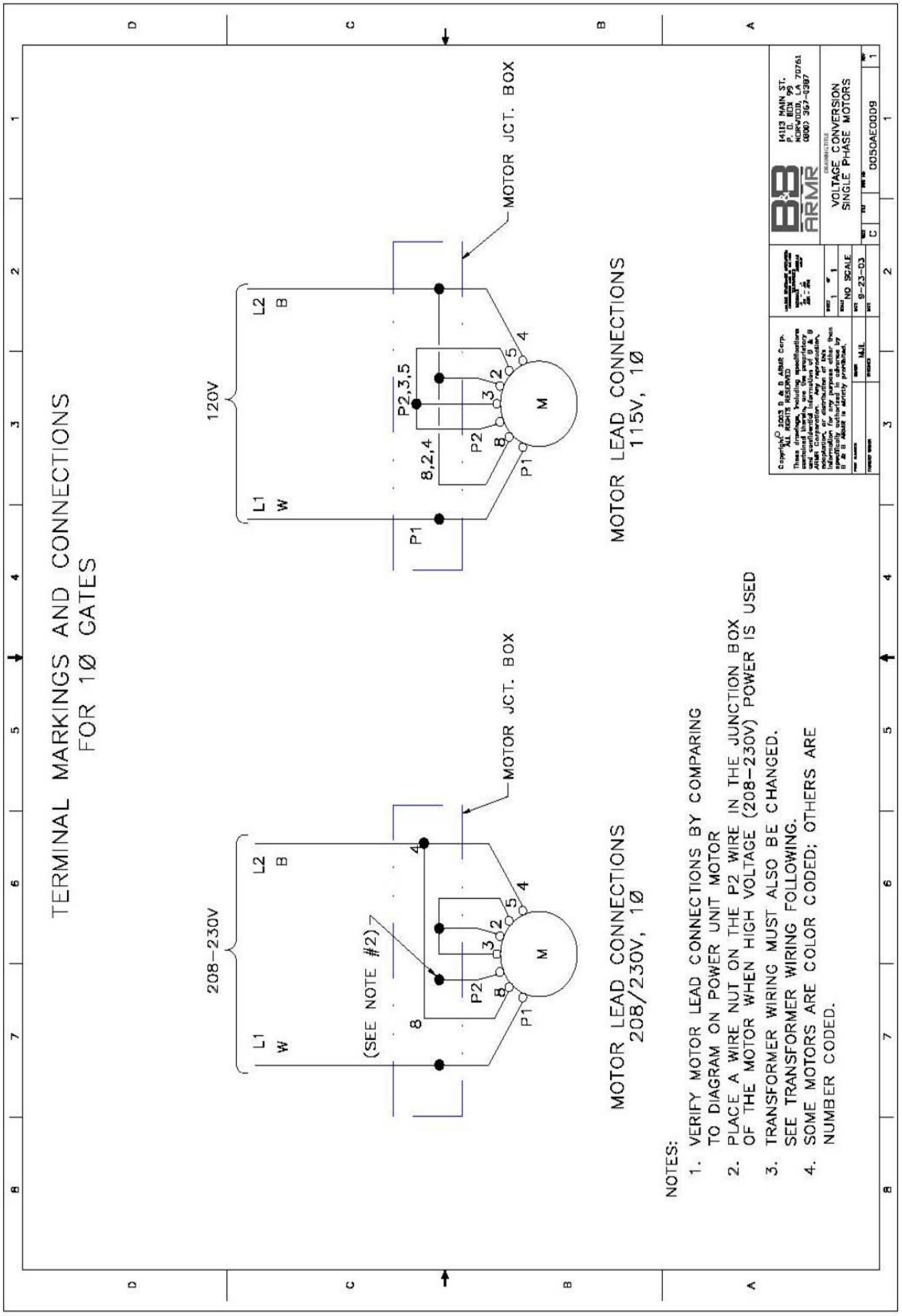
1. Maximum distance is measured from Power Source to Operator
2. Maximum distance for controls is measured from Operator to Pushbutton or Other device
3. If distance to power Source is greater than value shown use a higher voltage or three phase unit or contact utility company for a service feeder
4. If distance to Remote Control device is greater than 2000ft use a range extender device.
5. Power Tabels are based on stranded copper wires and allows up to 2% voltage drop
6. Control Table is based on stranded copper wires and allows up to 25% Connect Power per local codes
7. Connect Power per local codes
8. Run Power and Control wiring seperately
9. Ampere rating is motor full load; Startup up current may be higher
10. 100 VA Allowed for Controls & Heater
11. Wires sizes and reisatnce is from Mogami.
12. 0.1 Amps for control current, these may well vary for different models

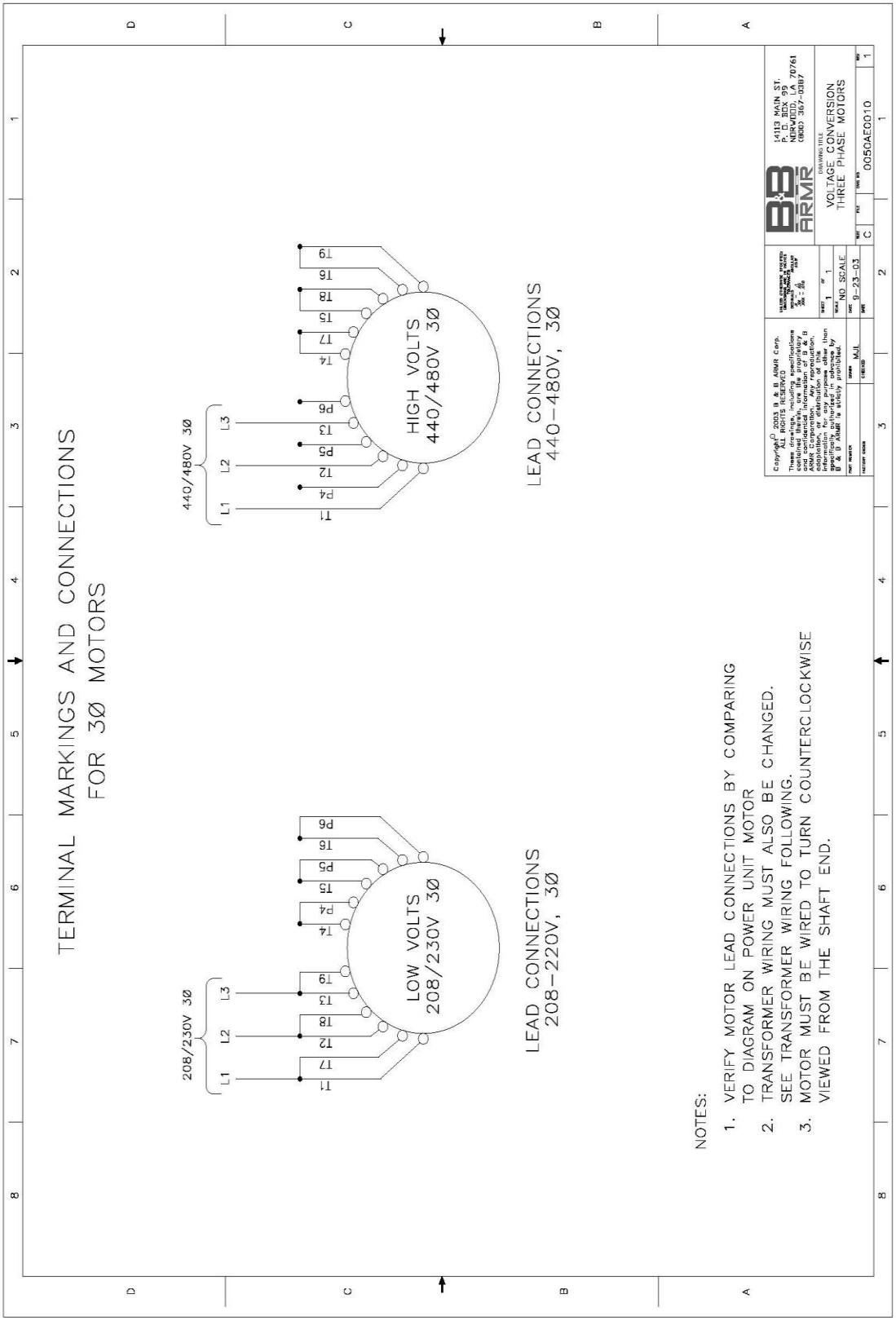
Battery Backup Input (1 ?)

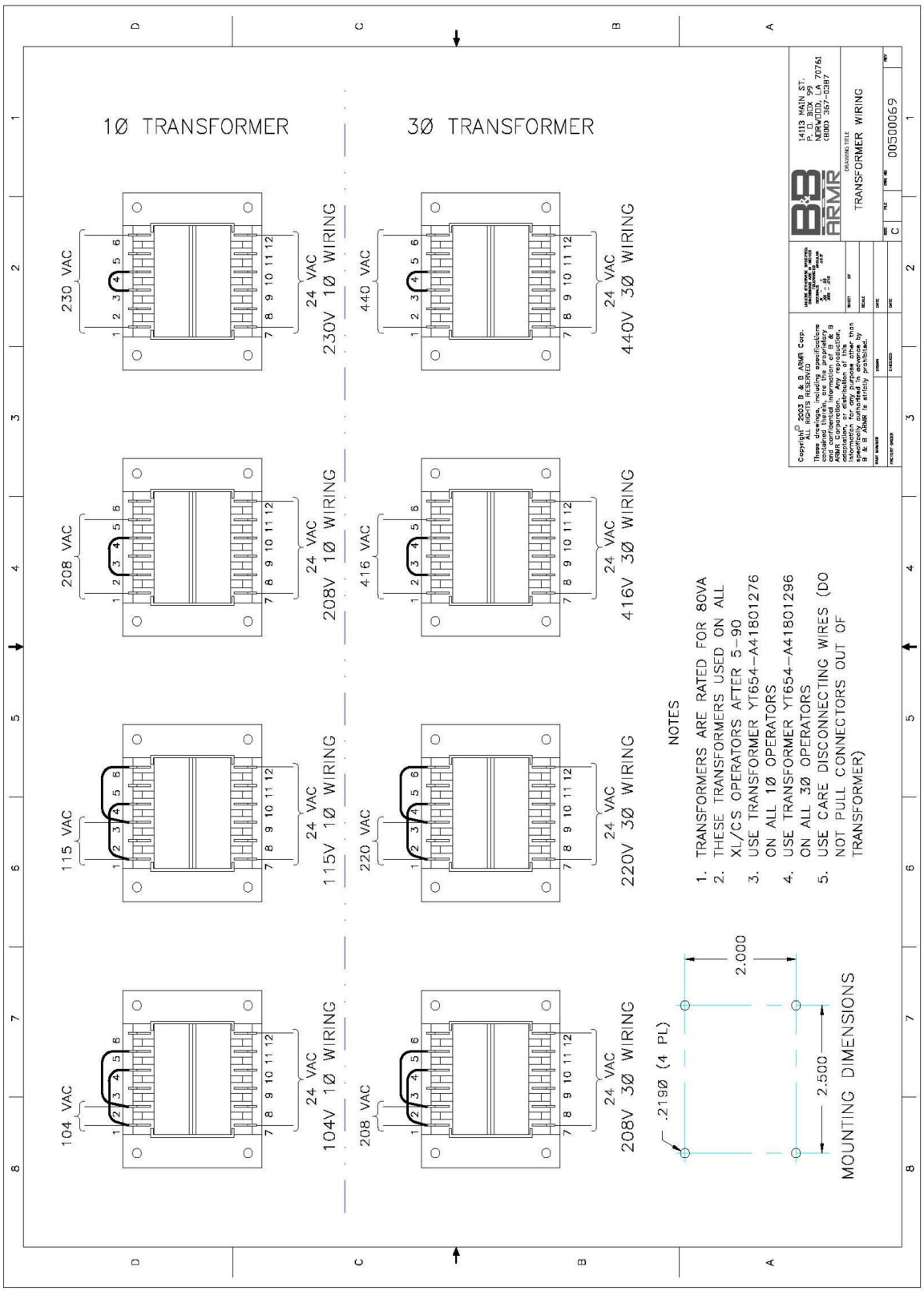
HP	Voltage	Wire		Single	Dual
	Amps	Gage	mm^2	Operator	Operators
0.4	115 V	12	3.309	120	60
	4.6 A.AC	10	5.261	200	100
	22.04 A.DC	8	8.366	320	160
		6	13.302	520	260
0.4	208 V	12	3.309	430	215
	2.5 A.AC	10	5.261	680	340
	21.67 A.DC	8	8.366	1090	545
		6	13.302	1730	865
0.4	230 V	12	3.309	510	255
	2.3 A.AC	10	5.261	820	410
	22.04 A.DC	8	8.366	1310	655
		6	13.302	2090	1045
0.75	115 V	12	3.309	90	45
	6.9 A.AC	10	5.261	140	70
	33.06 A.DC	8	8.366	230	115
		6	13.302	360	180
0.75	208 V	12	3.309	290	145
	3.8 A.AC	10	5.261	470	235
	32.93 A.DC	8	8.366	750	375
		6	13.302	1200	600
0.75	230 V	12	3.309	370	185
	3.4 A.AC	10	5.261	580	290
	32.58 A.DC	8	8.366	930	465
		6	13.302	1490	745
1.3	115 V	12	3.309	50	25
	13 A.AC	10	5.261	80	40
	62.29 A.DC	8	8.366	120	60
		6	13.302	200	100
1.3	208 V	12	3.309	160	80
	7.2 A.AC	10	5.261	260	130
	62.40 A.DC	8	8.366	420	210
		6	13.302	670	335
1.3	230 V	12	3.309	190	95
	6.7 A.AC	10	5.261	310	155
	64.21 A.DC	8	8.366	500	250
		6	13.302	800	400

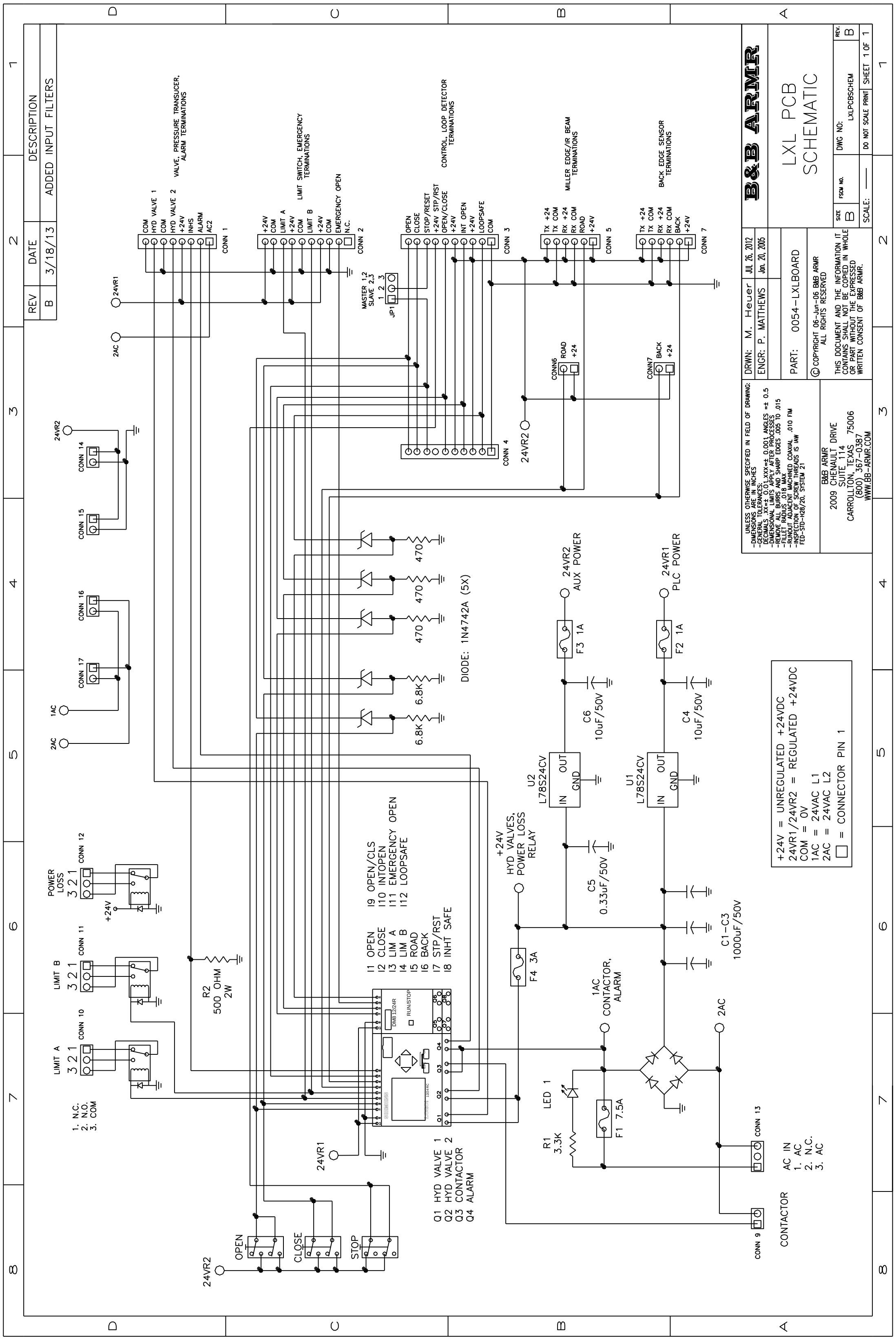
AWG Stranded Wire Resistance

Size		Diameter	R @ 77°F
AWG	mm^2	mm	Ohms /1000'
28	0.081	14.6	66.14
26	0.129	0.468	41.76
24	0.205	0.59	26.18
22	0.326	0.744	16.46
20	0.518	0.938	10.36
18	0.823	1.182	6.52
16	1.309	1.491	4.08
14	2.081	1.88	2.58
12	3.309	2.371	1.62
10	5.261	2.989	1.02
8	8.366	3.77	0.64
6	13.3	4.753	0.402


TERMINAL MARKINGS AND CONNECTIONS
FOR 1Ø GATES
MOTOR LEAD CONNECTIONS
208/230V, 1Ø
MOTOR LEAD CONNECTIONS
115V, 1Ø
MOTOR JCT. BOX
MOTOR JCT. BOX
208-230V
120V
L1
L2
W
B
(SEE NOTE #2)
P1
P2
P2,3,5
8,2,4
M
NOTES:
1. VERIFY MOTOR LEAD CONNECTIONS BY COMPARING TO DIAGRAM ON POWER UNIT MOTOR
2. PLACE A WIRE NUT ON THE P2 WIRE IN THE JUNCTION BOX OF THE MOTOR WHEN HIGH VOLTAGE (208-230V) POWER IS USED
3. TRANSFORMER WIRING MUST ALSO BE CHANGED. SEE TRANSFORMER WIRING FOLLOWING.
4. SOME MOTORS ARE COLOR CODED; OTHERS ARE NUMBER CODED.
B&B ARMR
14113 MAIN ST.
P. O. BOX 99
KEITHVILLE, LA 71051
(800) 367-4987
VOLTAGE CONVERSION
SINGLE PHASE MOTORS
NO SCALE
9-23-03
0050AEC0009


TERMINAL MARKINGS AND CONNECTIONS
FOR 3Ø MOTORS
208/230V 3Ø
L1 L2 L3
T1 T7 T2 T8 T3 T9 T4 P4 T5 P5 T6 P6
LOW VOLTS
208/230V 3Ø
LEAD CONNECTIONS
208–220V, 3Ø
440/480V 3Ø
L1 L2 L3
T1 P4 T2 P5 T3 P6 T4 T7 T5 T8 T6 T9
HIGH VOLTS
440/480V 3Ø
LEAD CONNECTIONS
440–480V, 3Ø
NOTES:
1. VERIFY MOTOR LEAD CONNECTIONS BY COMPARING TO DIAGRAM ON POWER UNIT MOTOR
2. TRANSFORMER WIRING MUST ALSO BE CHANGED. SEE TRANSFORMER WIRING FOLLOWING.
3. MOTOR MUST BE WIRED TO TURN COUNTERCLOCKWISE VIEWED FROM THE SHAFT END.
B&B ARMR
VOLTAGE CONVERSION
THREE PHASE MOTORS
0050AE0010
NO SCALE
9-23-03


1Ø TRANSFORMER
3Ø TRANSFORMER
230 VAC
24 VAC
230V 1Ø WIRING
440 VAC
440V 3Ø WIRING
208 VAC
208V 1Ø WIRING
416 VAC
416V 3Ø WIRING
115 VAC
115V 1Ø WIRING
220 VAC
220V 3Ø WIRING
104 VAC
104V 1Ø WIRING
208 VAC
208V 3Ø WIRING
NOTES
1. TRANSFORMERS ARE RATED FOR 80VA
2. THESE TRANSFORMERS USED ON ALL XL/CS OPERATORS AFTER 5-90
3. USE TRANSFORMER YT654-A41801276 ON ALL 1Ø OPERATORS
4. USE TRANSFORMER YT654-A41801296 ON ALL 3Ø OPERATORS
5. USE CARE DISCONNECTING WIRES (DO NOT PULL CONNECTORS OUT OF TRANSFORMER)
.2190 (4 PL)
2.000
2.500
MOUNTING DIMENSIONS
B&B ARMR
1413 MAIN ST.
P.O. BOX 99
MORGAN CITY, LA 70761
(800) 367-0387
TRANSFORMER WIRING
00500069
C


B&B ARMR
LXL PCB
SCHEMATIC
DRWN: M. Heuer JUL 26, 2012
ENGR: P. MATTHEWS JAN. 20, 2005
PART: 0054-LXLBOARD
REV B DATE 3/18/13 DESCRIPTION ADDED INPUT FILTERS
DWG NO: LXLPCBSCHEM
SHEET 1 OF 1
B&B ARMR
2009 CHENAULT DRIVE
SUITE 114
CARROLLTON, TEXAS 75006
(800) 367-0387
WWW.BB-ARMR.COM
DIODE: 1N4742A (5X)
+24V = UNREGULATED +24VDC
24VR1/24VR2 = REGULATED +24VDC
COM = 0V
1AC = 24VAC L1
2AC = 24VAC L2
= CONNECTOR PIN 1
I1 OPEN
I2 CLOSE
I3 LIM A
I4 LIM B
I5 ROAD
I6 BACK
I7 STP/RST
I8 INHT SAFE
I9 OPEN/CLS
I10 INTOPEN
I11 EMERGENCY OPEN
I12 LOOPSAFE
Q1 HYD VALVE 1
Q2 HYD VALVE 2
Q3 CONTACTOR
Q4 ALARM
24VR1 PLC POWER
24VR2 AUX POWER
F1 7.5A
F2 1A
F3 1A
F4 3A
C1-C3 1000uF/50v
C4 10uF/50v
C5 0.33uF/50v
C6 10uF/50v
U1 L78S24CV
U2 L78S24CV
R1 3.3K
R2 500 OHM 2W
AC IN
1. AC
2. N.C.
3. AC
CONTACTOR
1. N.C.
2. N.O.
3. COM
LIMIT A
LIMIT B
POWER LOSS
OPEN
CLOSE
STOP

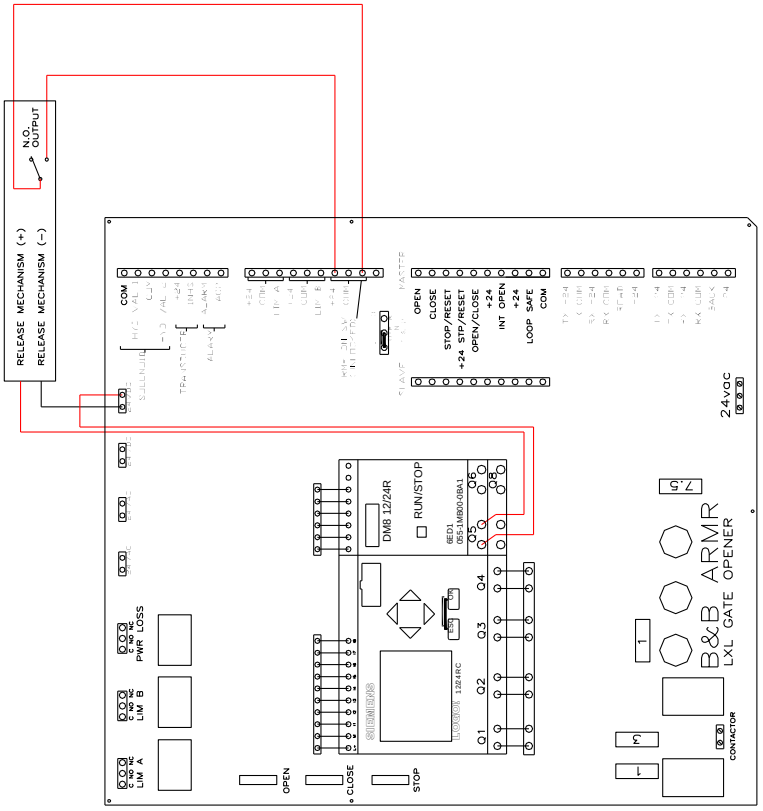


FIGURE 2 – USE WITH SELF–LATCHING MECHANISM

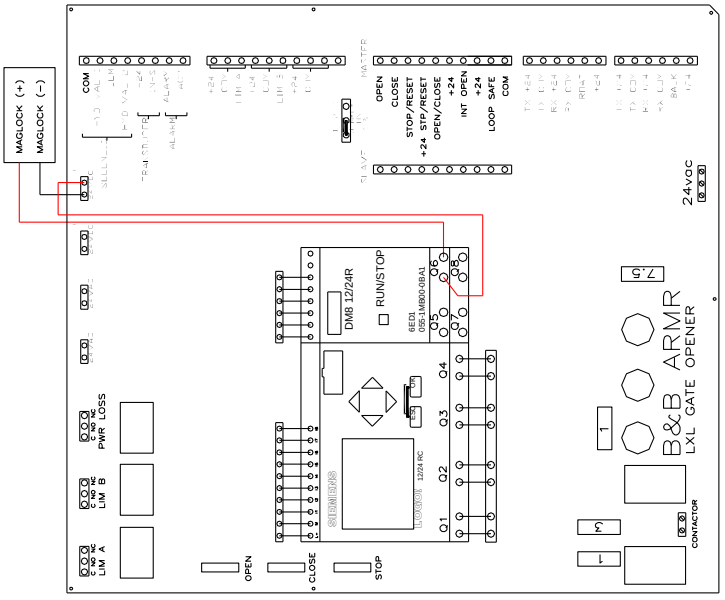


FIGURE 1 – USE WITH MAGLOCK

10. Troubleshooting

The table below provides a general guidance on identifying and correcting any problems with your LXL Series gate operator. If you encounter problems that you cannot fix, contact B&B ARMR and we will gladly work with you to correct them.

1.6 Alarm Definitions –

Continuous solid beep – Gate is moving or a Stop command is active
5sec On, 1sec Off – MaxRun Time Error
1sec On, 1sec Off – Forward and/or Reverse Safety
0.25sec On, 0.5sec Off – Inherent Safety Error

1.7 PLC Input/Output Definitions –

Symptom	Actions
Gate operator does not respond when commanded.	1. Check CONN 9 for power when command is given. 2. Check overload protector 3. Check PLC output. 4. Check that safeties are clear, and that IR Beams are aligned. 5. Check PLC input. 6. Check the +24VDC at CONN3 pins 8 and 10
Gate operator drives the gate in the incorrect direction.	1. Refer to step 4.10 of Installing and Programming the LXL Operator for setting the handing. 2. Refer to step 4.5 of Installing and Programming the LXL Operator to check for correct installation of the Limit Switch Plates.
Operator drives gate too slowly.	1. Check for any binding of the gate. 2. Check for slippage of the drive wheels. 3. Check the fluid level in the reservoir. 4. Check the quality of the hydraulic fluid. Old fluid will become sludgy and clogging of internal filter is possible.
MAX Runtime Error	1. Check for any binding of the gate. 2. Check for slippage of the drive wheels. 3. Check the fluid level in the reservoir. 4. Check the MAX RUN TIME setting in Parameters to insure sufficient time is set for the gate size. 5. REMEMBER – Gate only may only move 1 ft/sec
Date and time flash on the PLC.	1. Refer to step 4.11 of Installing and Programming the LXL Operator for setting the date and time. (Optional, not required to be set)
Gate does not stop automatically when encountering an obstacle.	1. Refer to step 4.15 of Installing and Programming the LXL Operator for setting the Inherent Safety. 2. Check for system pressure on Inherent Safety screen of the PLC, if no reading is evident while gate is running suspect a faulty pressure transducer. 3. Check the functionality of the safety devices. 4. Check safety device wiring, refer to sections 6 and/or 8
Operator drive wheels slip on gate and gate does not move.	1. Check for binding by disengaging the drive wheels, and ensuring that the gate rides smoothly manually. 2. Check the tension of the drive wheels, adjust as needed. 3. Check for any water or precipitation on the drive rail.
Fuses are blowing.	1. Check for incorrect incoming power to the LXL board. 2. Ensure all external devices are sending the correct voltage to the LXL board, and that there are no shorts.
PLC says Stop/Reset activated.	1. If using an external push button, ensure that the stop button is a normally closed contact. 2. If not using an external push button, ensure there is a jumper wire between stop/reset and +24 stp/rst on CONN 3. 3. Check the connection of the wire between the J1Pin 9

Symptom	Actions
	connector and I7 of the PLC. 4. Verify shunt is present on JP1 between pins 1 and 2. 5. Check F3.
Electric Motor turns but gate does not move.	1. Check the fluid level in the reservoir. 2. Check PLC outputs to see if Q1 turns on for an OPEN and/or Q2 turns on for a CLOSE. 3. Disengage drive wheels and check to see if they move. 4. If drive wheels move, check for binding in the gate. 5. If drive wheels do not move, check for loose coupling between the electric motor and pump assembly. 6. Check for voltage between COM and HYD VAL 1 and 2 on CONN 1 of LXL board, and ensure wires connections are tight. 7. If voltage is correct, manually shift the detent in the center of the solenoid on either side of the hydraulic valve, if wheels move suspect hydraulic valve. 8. If wheels do not move after manually shifting the detent, suspect pump assembly. 9. If unit is a 3 phase unit and a new installation, reverse two of the incoming power leads.

1.8 Equipment Maintenance Log Form

Product Type: _____
Location: _____

	Date	Performed By	Checklist Complete	Anomalies	Notes
Jan			Yes No		
Feb			Yes No		
Mar			Yes No		
Apr			Yes No		
May			Yes No		
Jun			Yes No		
Jul			Yes No		
Aug			Yes No		
Sep			Yes No		
Oct			Yes No		
Nov			Yes No		
Year			Yes No		

	Date	Performed By	Checklist Complete	Anomalies	Notes
Jan			Yes No		
Feb			Yes No		
Mar			Yes No		
Apr			Yes No		
May			Yes No		
Jun			Yes No		
Jul			Yes No		
Aug			Yes No		
Sep			Yes No		
Oct			Yes No		
Nov			Yes No		
Year			Yes No		

11. Warranty Information

BBRSS warranties for a period of one (1) year FOB manufacturing facility, unless otherwise specified by BBRSS in writing, from defects due to faulty material or workmanship. Damage due to handling during shipment and installation are not covered under warranty. BBRSS assumes no responsibility for service at customer site. BBRSS is in no event responsible for any labor costs under the warranty. Subject to the above limitation, all service, parts, and replacements necessary to maintain the equipment as warranted shall be furnished by others. BBRSS shall not have any liability under these specifications, other than for repair or replacement as described above for faulty product material or workmanship. Equipment malfunction or equipment failure of any kind, caused for any reason, including, but not limited to unauthorized repairs, improper installation, installation not performed by BBRSS authorized personnel, incoming supply power is outside the tolerance for the product, failure to perform manufacturer's suggested preventative maintenance, modifications, misuse, accident, catastrophe, neglect, natural disaster, are not under warranty.

The exclusive remedy for breach of any warranty by BBRSS shall be the repair or replacement at BBRSS's option, of any defects in the equipment. **IN NO EVENT SHALL BBRSS BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES OR ANY KIND OF PERSONAL DAMAGES.** Except as provided herein, BBRSS makes no warranties or representations to consumer or to anyone else and consumer hereby waives all liability against BBRSS as well as any other person for the design, manufacture, sale, installation, and/or servicing of the Products.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO OTHER WARRANTIES EXIST.

Any modification or alteration by anyone other than BBRSS will render the warranty herein as null and void.