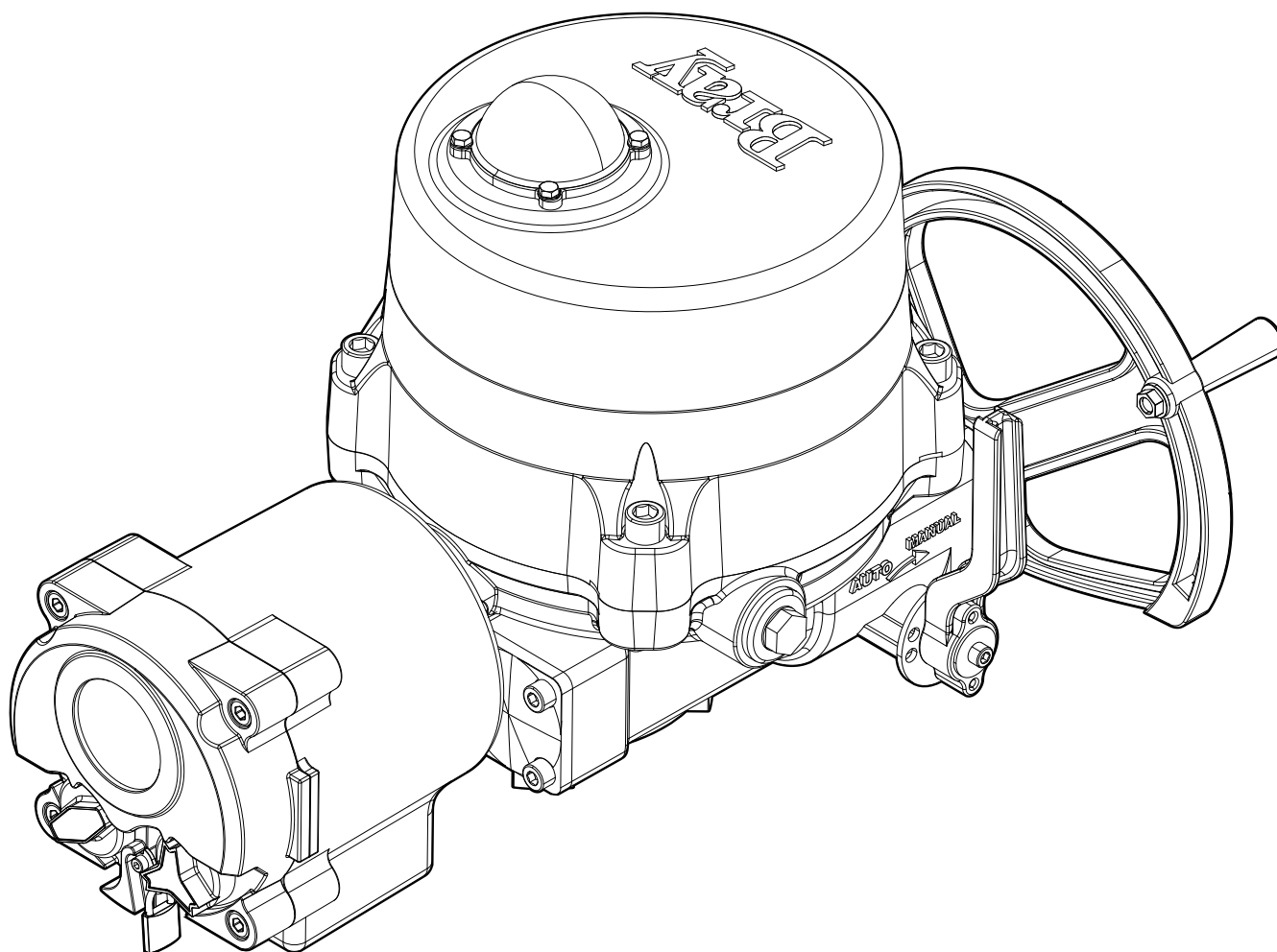


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**SERIES 76**

**LOCAL CONTROL STATION (ON/OFF)**

Installation, Operation, and Maintenance Manual



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**Bray**<sup>®</sup>

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**READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY.  
SAVE THIS MANUAL FOR FUTURE USE  
FOR THE LATEST IOM VERSION, VISIT [BRAY.COM](https://www.bray.com)**

## 1.0 DEFINITION OF TERMS

All information within this manual is relevant to the safe operation and proper care of your Bray valve. Please understand the following examples of information used throughout this manual.

### 1.1 Safety Statements

The terms DANGER, WARNING, CAUTION, and NOTICE are used in this document to prevent unwanted consequences. Standard symbols and classifications are:



#### **DANGER**

Indicates an immediate hazardous situation which if not avoided, **will** result in death or serious injury and/or property damage.



#### **WARNING**

Indicates a potentially hazardous situation which if not avoided, **could** result in death or serious injury and/or property damage.



#### **CAUTION**

Indicates a potentially hazardous situation which if not avoided, **may** result in minor or moderate injury and/or property damage.



#### **NOTICE**

Indicates and provides additional technical information which may not be obvious, even to qualified personnel. The term is not used for personal injury hazards or warnings, but can be used to indicate possible equipment or property damage.

**NOTE:** Provides important information related to a procedure.

Compliance with other notes — regarding transport, assembly, operation & maintenance, and about technical documentation (e.g. in the operating instructions, product documentation, or on the product itself) — is essential, to avoid conditions which can directly or indirectly cause severe personal injury or property damage.

## 2.0 INTRODUCTION

The Bray Series 76 Local Control Station (LCS) offers comprehensive control and monitoring capabilities for all sizes of the Bray Series 76 weatherproof and explosion-proof industrial electric actuators.



### NOTICE

The explosion-proof Series 76 electric actuator requires special machining to mount the LCS. Machining of this housing and field installation of the explosion-proof LCS is not permitted. This option must be ordered with the actuator, directly from the factory.

## 2.1 Principles of Operation

The Bray Series 76 LCS provides a Local-Remote-Stop control switch, an Open-Close control switch, LED indication, and a motor-starter/reversing contactor (used for 3 phase motors). It has both a local mode enabling direct operation from a local control point, and a remote mode for operation from a process controller.

For On/Off operation, the LCS positions the Series 76 Actuator to its fully opened or closed positions. The LCS requires dedicated power and responds to an open or closed command signal from the process controller.

The Series 76 LCS consists of a mounting bracket, main body, and cover. The mounting bracket is used to mount the main body of the LCS to the weatherproof housing. Explosion-proof models use a sealing bushing between the main body of the LCS and the actuator.

The LCS cover is mounted to the main body using four bolts. The LCS cover utilizes a spigot joint and O-ring which creates a tight seal between it and the LCS body.

The explosion proof version of the LCS utilizes a gasket and sealing gland between the LCS body and the main actuator body.

## 2.2 Electrical Operation

Series 76 electric actuators rated for 220VAC through 440VAC, 3 phase power, use a power board in addition to a control board to control the motor direction. Series 76 electric actuators rated for 460VAC, 3 phase power, use a dedicated reversing contactor. Single-phase LCS models directly control the motor from the control board.

Various actuator connections for limit switches, torque switches, and the potentiometer, terminate directly into headers on the control board. Connections are also made to a transformer, power electronics card, and/or reversing contactor when required for the model.

### 2.3 Approved Locations and Certifications

The Bray Series 76 LCS is listed as part of the general actuator certification and must be assembled to the actuator for the certification to apply. It is designed and certified to operate as outlined below:



#### NOTICE

Each certificate type contains limitations in model availability.

The weatherproof Bray Series 76 LCS is certified for use in North America and complies with applicable EU directives (CE) when installed on the weatherproof Series 76 industrial electric actuator.

**CSA Certificate: 80153557**



#### NOTICE

See the Series 76 Industrial Electric Actuator Weatherproof IOM for additional details.

The explosion-proof Bray Series 76 LCS is certified for ATEX and IECEx hazardous locations when installed on the ATEX/IECEx certified Series 76 industrial electric actuator.

**ATEX Certificate: DEKRA 23ATEX0092 X**

**IECEx Certificate: IECEx DEK 23.0064X**



#### NOTICE

See the Series 76 Industrial Electric Actuator Explosion-proof IOM for full details.

## 3.0 HAZARD FREE USE

This device left the factory in proper condition to be safely installed and operated in a hazard-free manner. The notes and warnings in this document must be observed by the user to ensure hazard-free operation of this device.

Configuration and setup procedures for this device are described in this manual. Proper configuration and setup are required for the safe operation of this device.

The control system in which this device is installed must have proper safeguards to prevent injury to personnel, or damage to equipment, should a failure of system components occur.



### **WARNING**

Equipment controlled by the device can generate large mechanical forces during normal operation.

## 4.0 QUALIFIED PERSONNEL



### WARNING

The actuator must only be installed, commissioned, operated and repaired by qualified personnel.

Installation, commissioning, operation and maintenance must be performed under strict observation of all applicable codes, standards and safety regulations.

As per this document, a qualified person is one who is trained in:

- > The operation and maintenance of electric equipment and systems in accordance with established safety practices.
- > Procedures to energize, de-energize, ground, tag and lock electrical circuits and equipment in accordance with established safety practices.
- > The proper use and care of Personal Protective Equipment (PPE) in accordance with established safety practices.
- > First Aid.
- > In cases where the device is installed in a potentially explosive (hazardous) location – is trained in the operation, commissioning, operation and maintenance of equipment in hazardous locations.

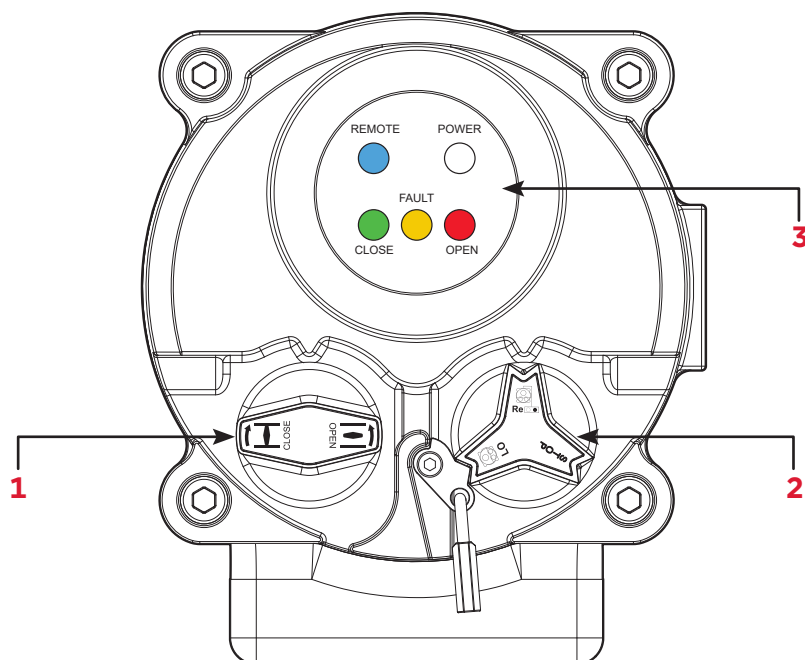


### WARNING

Reference is specifically made here to observe all applicable safety regulations for actuators installed in potentially explosive (hazardous) locations.

## 5.0 LOCAL USER INTERFACE

**FIGURE 01:** Local User Interface



**TABLE 01:** Local User Interface

Item	Description
1	Open/Close Switch
2	Local (Lo)/Remote (Re)/Stop Switch
3	LED Indicator Display

The above are all accessible from the exterior of the cover. This control interface allows the customer to enable and disable control from the process controller, electrically command the actuator to a desired position, and evaluate operating conditions through LED diagnostics. The Local (Lo)/Remote (Re)/Stop Switch can be padlocked in place.

**TABLE 02:** LED Indicator Display

LED	Color	Description
Remote	Blue	Remote Mode Active
Power	White	Actuator Powered
Fault	Yellow	Fault Detected
Close	Green	Fully Close/Closing
Open	Red	Fully Open/Opening



## 5.1 Advanced LED Status Indicators for LCS

**TABLE 03:** Local Mode

Mode	Status	LED Display				
		White	Blue	Green	Yellow	Red
Standard Local	Fully Close	On	Off	On	Off	Off
	Closing	On	Off	Flash	Off	Off
	Fully Open	On	Off	Off	Off	On
	Opening	On	Off	Off	Off	Flash
	Fault Close Over Torque	On	Off	On	Flash	Off
	Fault Open Over Torque	On	Off	Off	Flash	On

**Note:** See Appendix B for troubleshooting guidance

**TABLE 04:** Remote Mode

Mode	Status	LED Display				
		White	Blue	Green	Yellow	Red
Standard Remote	Fully Close	On	On	On	Off	Off
	Closing	On	On	Flash	Off	Off
	Fully Open	On	On	Off	Off	On
	Opening	On	On	Off	Off	Flash
	Stopped Mid-Travel	On	On	Off	Off	Off
	Fault Close Over Torque	On	On	On	Flash	Off
	Fault Open Over Torque	On	On	Off	Flash	On
	Fault Open & Close (engaged at the same time)	On	On	Off	Flash	Off

**Note:** See Appendix B for troubleshooting guidance

**TABLE 05:** Stop Mode

Mode	Status	LED Display				
		White	Blue	Green	Yellow	Red
Stop Mode	Fully Close	On	Off	On	Off	Off
	Fully Open	On	Off	Off	Off	On
	Mid Travel	On	Off	Off	Off	Off

## 6.0 HARDWARE DESCRIPTION

The Local Control Station comes with either a 3-Phase or a 1-Phase control board, depending on the actuator voltage. The 3-Phase LCS has a power board in addition to the control board. Please reference images below to identify which board(s) you have within your Local Control Station.

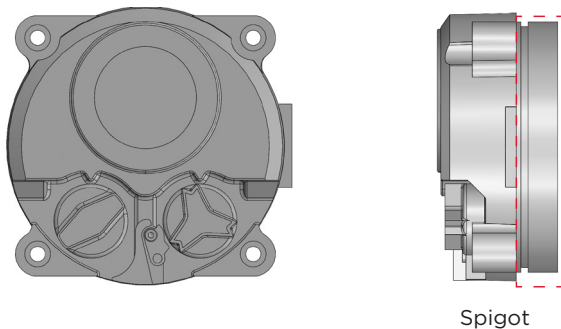
The main control board is mounted to the inside of the LCS cover, and a transformer provides low voltage to the control board from the main actuator voltage supply. For custom setting adjustments via the control board, DIP switches are provided.



### WARNING

The LCS cover has a Spigot with an integrated flamepath. Treat the cover with care while handling, as the flamepath must not be damaged or dirtied in any way. Contact the factory if the spigot joint is damaged.

**FIGURE 02:** LCS Cover Spigot



### WARNING

The LCS cover mounting bolts are not retained by the cover. Bolts must be properly installed and only original equipment must be used to maintain certification. Contact the factory if a replacement is required.

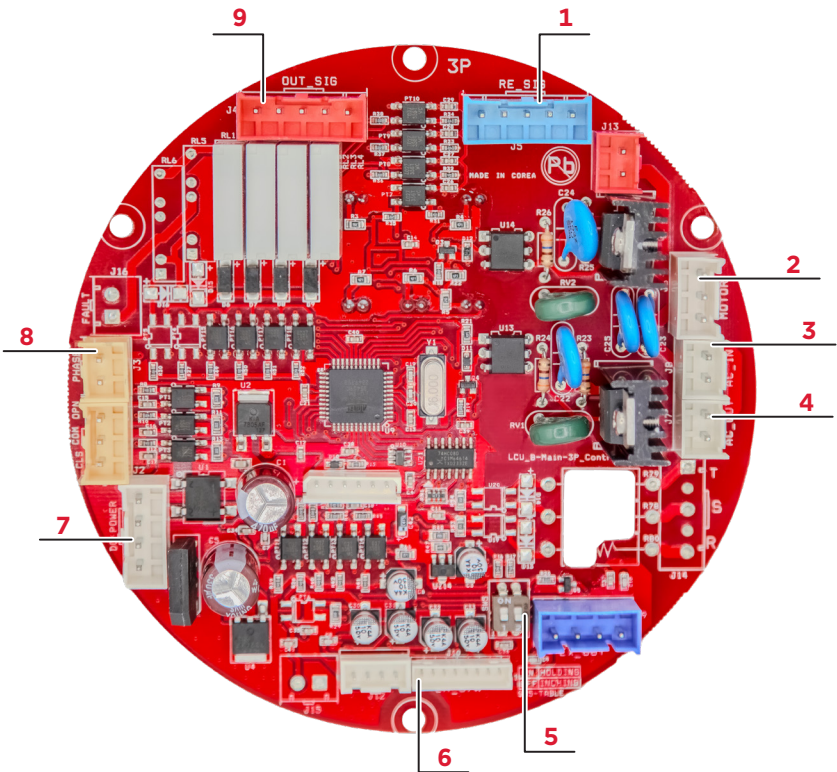


### WARNING

The transformer is specific to the actuator's rated supply voltage and cannot be used to power the LCS Control Board on an actuator with a different supply voltage.

**6.1 On/Off Control Board (3-Phase)**

**FIGURE 03:** On/Off Control Board (3-Phase)

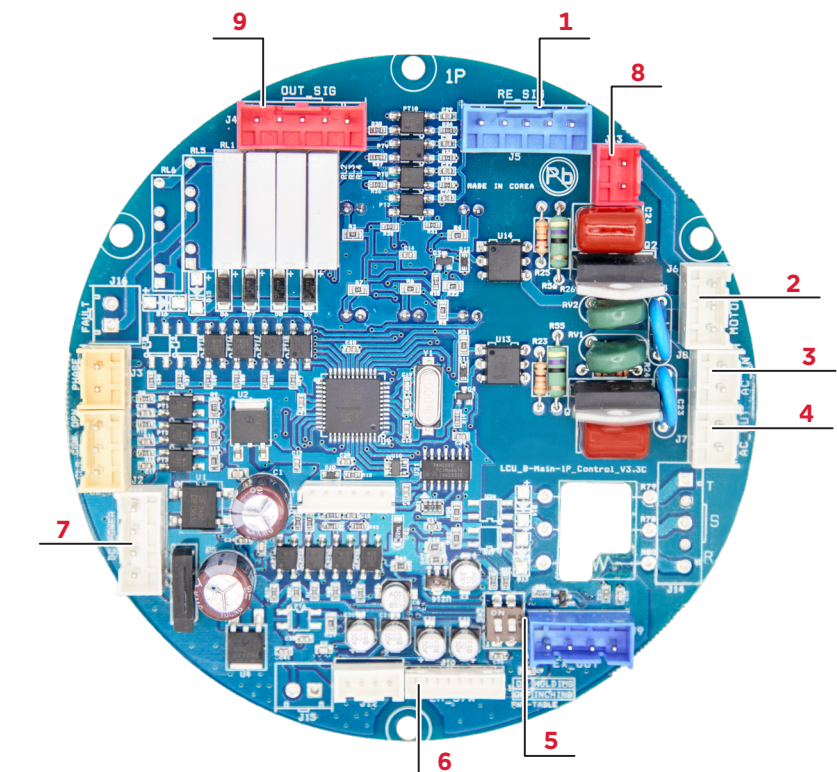


**TABLE 06:** On/Off LCS  
Control Board Parts (3-Phase)

No.	Part
1	Remote Signal Control Header
2	Direction Control Header
3	Power Input Header
4	Power Output Header
5	Mode Change DIP Switches (2-Switch)
6	Limit & Torque Switch Signal Header
7	Control Board Power Input Header
8	5VDC and 12VDC Output Header
9	Relay Output Signal Header

**6.2 On/Off Control Board (1-Phase)**

**FIGURE 04:** On/Off Control Board (1-Phase)

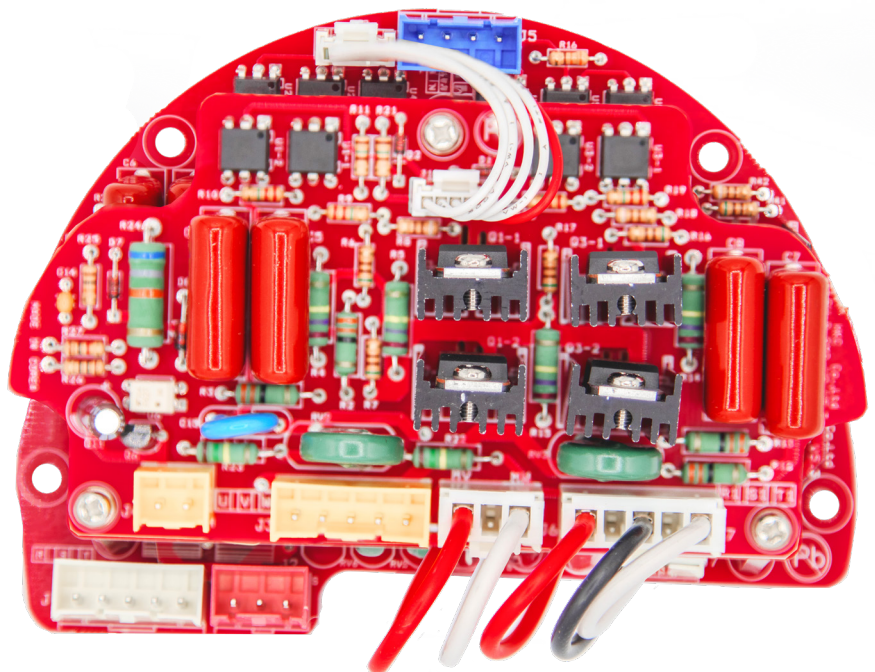


**TABLE 07:** On/Off LCS  
Control Board Parts (1-Phase)

No.	Part
1	Remote Signal Header
2	Direction Control Header
3	Power Input Header
4	Power Output Header
5	Mode Change DIP Switches (2-Switch)
6	Limit & Torque Switch Signal Header
7	Control Board Power Input Header
8	Capacitor Header
9	Relay Output Signal Header

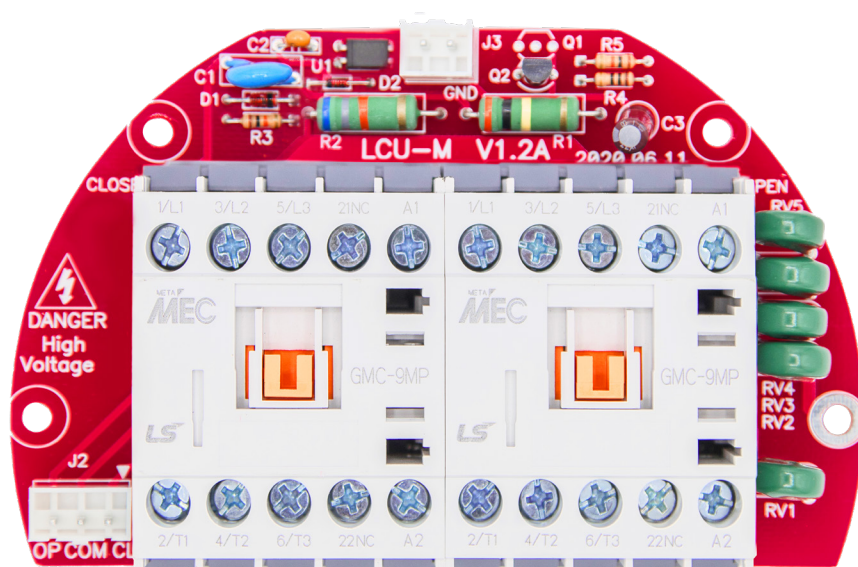
## 6.3 Solid-State Power Board (3-Phase)

**FIGURE 05:** Solid-State Power Board (240-440 VAC)



## 6.4 Contactor Power Board (3-Phase)

**FIGURE 06:** Contactor Power Board (460VAC)



## 7.0 MODES OF OPERATION

This section provides the information necessary for the initial setup of the Series 76 Local Control Station. It also gives guidance on various operation modes and configurations. Series 76 Local Control Stations that are supplied with an On/Off board, do not require inspection of internal wiring as it is pre-wired for immediate use.

For On/Off operation, a process controller can be used to position the Series 76 actuator to its fully open or closed positions. The process controller can be overridden by switching the LCS to “Local” mode, allowing the use of the LCS Open/Close control knob instead.

### 7.1 Local Mode Operation

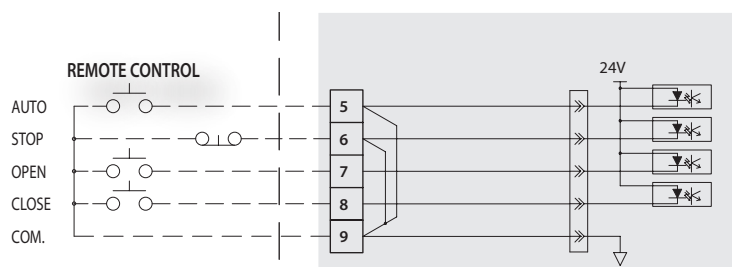
When the “Local/Remote/Stop” Switch is set to Local Mode, the actuator can be operated to the open or close position using the “Open/Close” Switch by turning the switch either in the clockwise or counterclockwise direction.

### 7.2 Remote Mode Operation

When the “Local/Remote/Stop” Switch is set to Remote Mode, the actuator can be operated to the open or close position remotely by a process controller.

Remote On/Off operation is based on making or breaking an electrical connection from terminals 5, 6, 7, and 8 to terminal 9 as indicated in Figure 07 below. It operates the actuator to the open or close positions by establishing contact between terminal 9 (COM) and either terminal 7 (Open) or terminal 8 (Close). The remote open and closed commands can function in the Inching or Hold mode. See section 7.5 for additional information on these modes of operation.

**FIGURE 07:** Remote Control Wiring



Please reference ON/OFF LCS WIRING DIAGRAM (Section 8.0) for full wiring diagram.

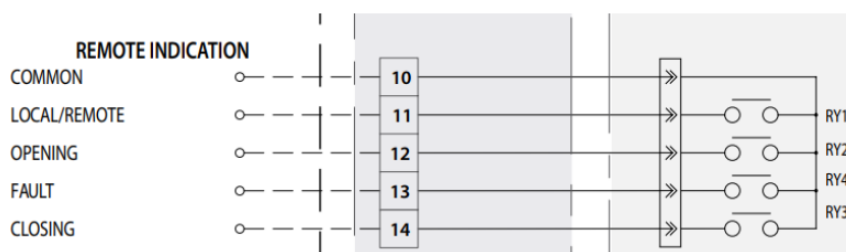


## 7.3 Remote Status Signal Operation

Remote Status Signals are crucial for relaying information about the actuator's status to an external system, usually a control panel or another signaling device. This communication is facilitated through contacts that convey the actuator's condition to the external system. The state of these external output signal contacts changes in response to specific actuator conditions, such as movement to open or close, encountering a fault, or reaching a fully open or closed position.

For example, the LOCAL/REMOTE status can be verified using contact 10 (COMMON) and 11 (LOCAL/REMOTE). When the LCS's knob is set to "Remote", it closes the contact, signaling that the actuator is in remote mode. Please reference Figure 08 below.

**FIGURE 08:** Remote Indication Wiring



This principle is similarly applicable to the OPENING, FAULT, and CLOSING. Additionally, the auxiliary contacts are used to indicate whether the actuator is in a fully closed or fully opened position.

**Note:** The OPENING, FAULT and CLOSING remote indication would also be available while the actuator is operating in Local Mode.

## 7.4 Stop Mode Operation

When the "Local/Remote/Stop" Switch is set to Stop Mode, this stops the operation of the actuator. In order to have the actuator operational again, you would need switch back to either the "Local" or "Remote" Mode.

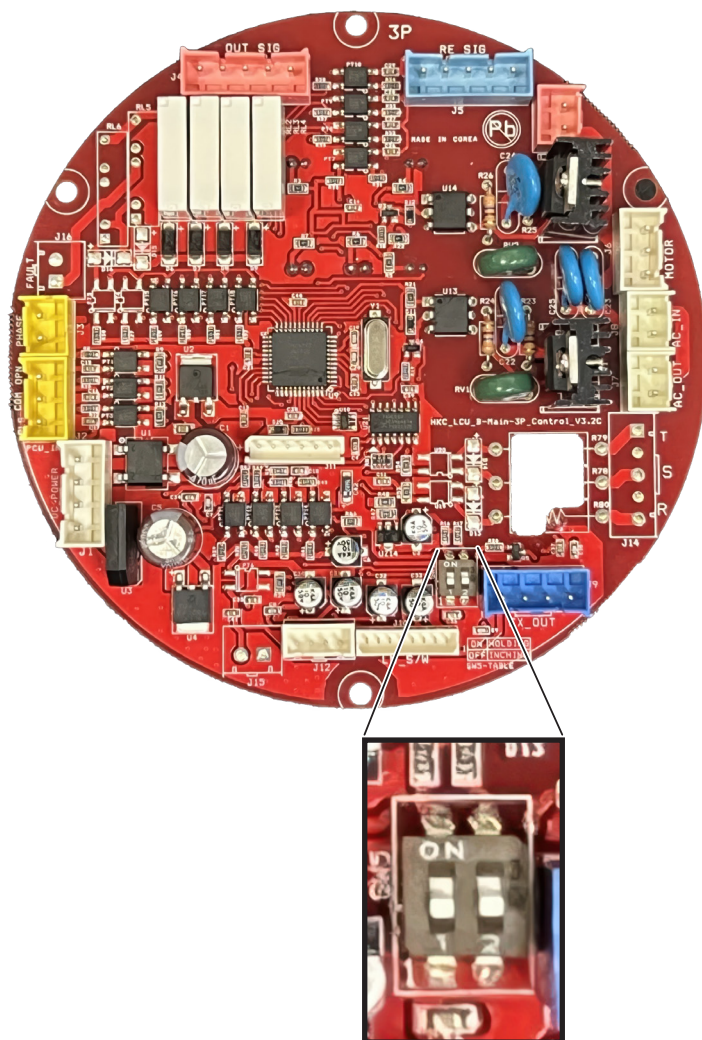
## 7.5 Inching/Hold Mode Operation

The “Inching” or “Hold” Mode feature allows for a “momentary” or a “maintained” operation of the Open/Close switch. How this operates is described below:

1. **Inching Mode:** In this mode, the actuator operates if the switch is held temporarily in either direction of travel using the Open/Close knob on the Local User Interface. This is considered the “momentary” operation, and it is activated by moving Switch 1 shown in Figure 09 to the “up” position.
2. **Hold Mode:** In this mode, the actuator operates continuously in either direction of travel by toggling the Open/Close knob and keeping it in that state until the knob is released. Upon release of knob, the actuator stops its operation, allowing for mid-travel positioning to a desired position. This is considered the “maintained” operation, and it is activated by moving Switch 1 shown in Figure 09 to the “down” position.

The Inching and Hold modes also affect Remote Mode Operation. Refer to section 7.2.

**FIGURE 09:** DIP Switch Location on Board



## 7.6 Fault Relay NO/NC Mode Operation

Switch 2, shown in Figure 09 above, allows for the selection between A-Contact and B-Contact configurations:

**A-Contact (Normally Open / N.O.):** In this setting, a normally opened contact is used. When a fault occurs, an internal switch activates and provides continuity between terminals 10 and 13.

To activate this mode toggle Switch 2 to the “up” position.

**B-Contact (Normally Close / N.C.):** In this setting, a normally closed contact is used. When a fault occurs, the internal switch deactivates and disconnects continuity between terminals 10 and 13.

To activate this mode toggle Switch 2 to the “down” position.

The choice of using the A-Contact or the B-Contact depends on the specific application.

For example, the A-Contact mode is typically used for monitoring signals, like an external LED that indicates there is a fault condition to a process controller. The B-Contact mode on the other hand could be used to cause an external safety device to turn off in the event of a fault condition on the actuator.

**Note:** These settings only apply to fault mode on contact 13 (FAULT) shown in Figure 08 above.

## 7.7 Default Settings

**TABLE 08:** Factory Standard Settings - On/Off Local Control Station

Setting	Default
Inching/Hold Mode	Inching
Fault Relay Mode (N.O./N.C.)	N.O.

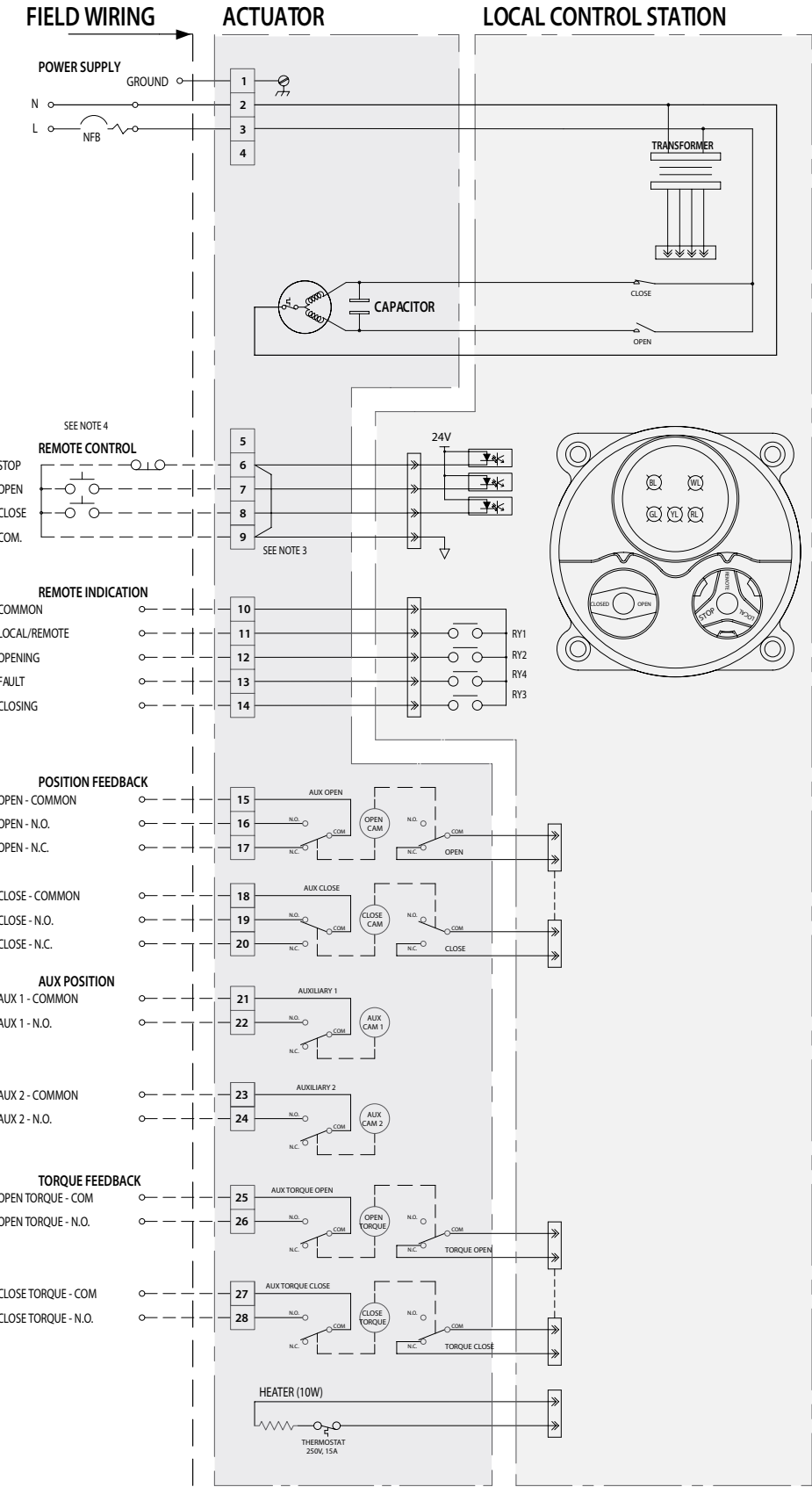


# SERIES 76 LOCAL CONTROL STATION (ON/OFF)

Installation, Operation, and Maintenance Manual



## 8.0 ON/OFF LCS WIRING DIAGRAM - 1-PHASE (SAMPLE)



### LEGEND:

- BL: BLUE LAMP - REMOTE MODE ACTIVE
- WL: WHITE LAMP - POWER
- GL: GREEN LAMP - CLOSE/CLOSING
- YL: YELLOW LAMP - FAULT PRESENT
- RL: RED LAMP - OPEN/OPENING
- RY: RELAY
- COM: COMMON CONTACT
- N.O.: NORMALLY OPEN CONTACT
- N.C.: NORMALLY CLOSED CONTACT
- L: POWER - LIVE
- N: POWER - NEUTRAL
- NFB: NO FUSE BREAKER

### NOTES:

1. THE ACTUATOR IS SHOWN IN THE CLOSED POSITION.
2. THE OPEN/CLOSED SELECTOR SWITCH IS SPRING RETURNED TO THE NEUTRAL POSITION.
3. A JUMPER IS PROVIDED BETWEEN TERMINALS (6 & 9). REMOVE JUMPER IF REMOTE CONTROL FUNCTIONALITY IS REQUIRED.
4. SWITCHES CONNECTED TO TERMINALS 6 - 9 MUST BE VOLTAGE FREE. APPLYING POWER TO THESE TERMINALS MAY CAUSE DAMAGE TO THE ELECTRONICS.

### FIELD WIRE RATINGS:

14-28 AWG, Cu, 105°C  
300V MIN RATED WIRE

### RELAY CONTACT RATINGS:

250VAC, 5A MAX

### SWITCH CONTACT RATINGS:

250VAC, 10A MAX

### \*\* SWITCH CONTACT POSITIONS \*\*

SWITCH	TERM	VALVE OPENING (%)	
		0	100
AUX OPEN	15-16	---	---
	15-17	---	---
AUX CLOSE	18-19	---	---
	18-20	---	---

SWITCH	TERM	VALVE OPENING (%)	
		P1	P2
AUX LIMIT 1	21-22	---	---
AUX LIMIT 2	22-24	---	---

SWITCH	TERM	TORQUE (%)	
		100-125	
OPEN	25-26	---	---
CLOSE	27-28	---	---

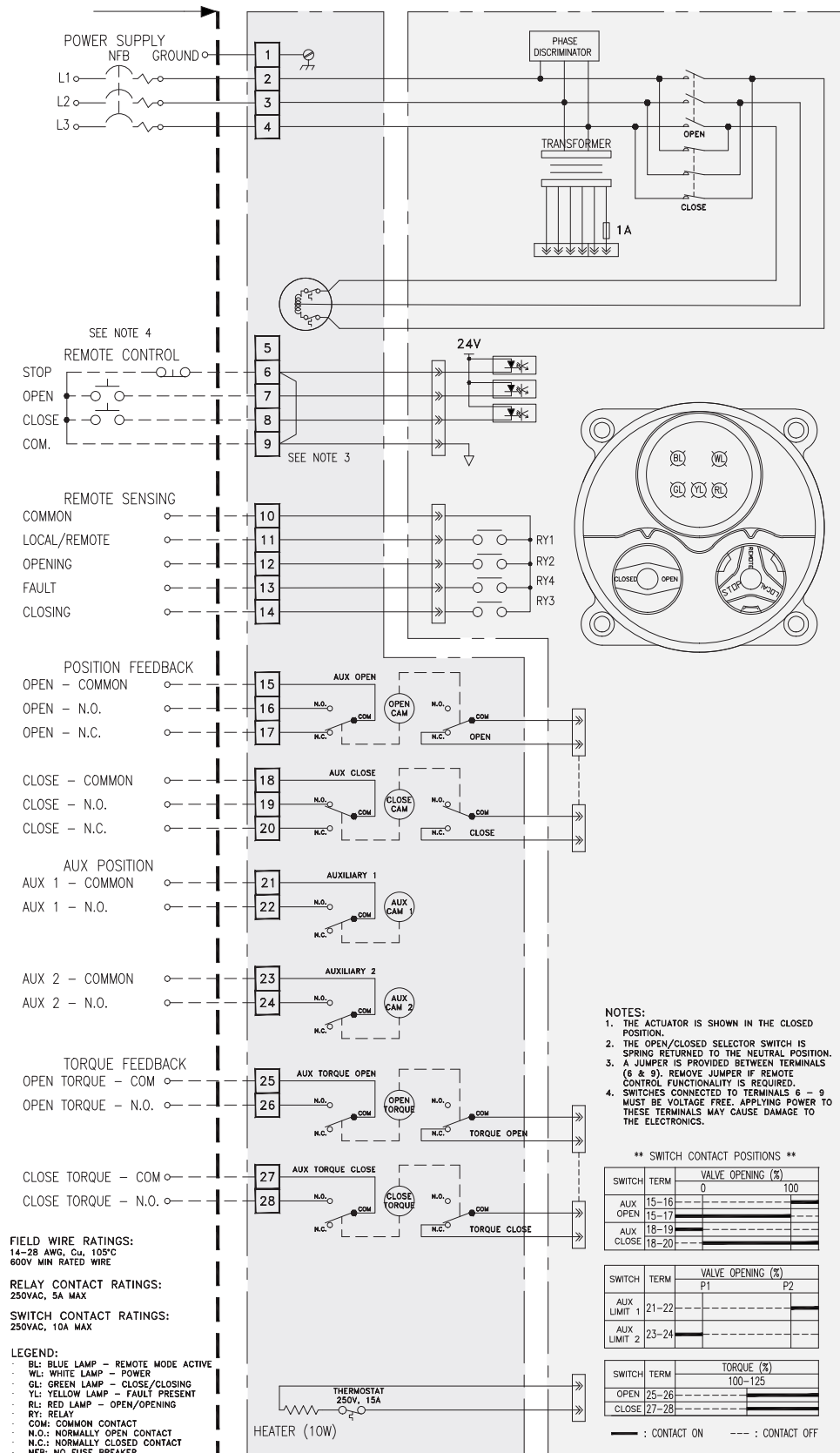
— : CONTACT ON    - - - : CONTACT OFF

# SERIES 76 LOCAL CONTROL STATION (ON/OFF)

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## 9.0 ON/OFF LCS WIRING DIAGRAM - 3-PHASE (SAMPLE)



## 10.0 APPENDIX A - BASIC TOOLS

Common To All Units	
Terminal Connections	Flathead screwdriver up to 3mm
Ground Screw	4mm hex
Handwheel Spinner	5mm hex
Conduit Blanks	18mm wrench
LCS Cover Bolts	6mm hex





Actuator Size	Cam Adjustment Bolts	Cover Screws	Travel Stop Adjustment		Bushing Mounting Bolts
	Hex Key	Hex Key	Hex Key	Wrench	Hex Key
1A, 1B, 1X, 1Y	3mm	6mm	4mm	13mm	3mm
2A, 2B, 2X, 2Y	4mm	8mm	5mm	17mm	4mm
3A, 3B, 3C, 3X, 3Y, 3Z	4mm	10mm	5mm	17mm	5mm
4A, 4B, 4X, 4Y	4mm	10mm	6mm	19mm	6mm
5A, 5B, 5X, 5Y	4mm	10mm	--	24mm	6mm
6A, 6B	4mm	14mm	30mm	30mm	6mm
7A, 7B, 7C	4mm	14mm	--	46mm	8mm

# SERIES 76 LOCAL CONTROL STATION (ON/OFF)

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## 11.0 APPENDIX B - LCS TROUBLESHOOTING GUIDE

Mode	Fault Condition	LED Display					Possible Solution
		White	Blue	Green	Yellow	Red	
Local	Close Direction Over Torque	On	Off	On	Flashing	Off	In Local Mode, initiate opening via the Open/Close switch on the Local User Interface or by rotating the handwheel in the open direction.
							 <b>WARNING</b> It is important to investigate and correct the cause of the overtorque condition.
Local	Open Direction Over Torque	On	Off	Off	Flashing	On	In Local Mode, initiate closing via the Open/Close switch on the Local User Interface or by rotating the handwheel in the close direction.
							 <b>WARNING</b> It is important to investigate and correct the cause of the overtorque condition.
Remote	Close Direction Over Torque	On	On	On	Flashing	Off	In Remote Mode, initiate opening by sending an 'Open' command or by manually turning the handwheel in the open direction.
							 <b>WARNING</b> It is important to investigate and correct the cause of the overtorque condition.
Remote	Open Direction Over Torque	On	On	Off	Flashing	On	In Remote Mode, initiate closing by sending a 'Close' command or by manually turning the handwheel in the close direction
							 <b>WARNING</b> It is important to investigate and correct the cause of the overtorque condition.
Remote	Both Open and Close Limit Switches Detected	On	On	Off	Flashing	Off	> Check Cams and ensure they are set correctly. > Check continuity of switches while manually activating/deactivating switches. > Check the switch wiring for a loose connection. > Ensure the switch connector is fully seated in its header on the Control Board. > Before performing any of the above, ensure power to the actuator has been removed.
Local	3-Phase Wire Reversed or Open Phase	On	Off	On	Flash	On	Flip any two of the 3-phase field wire connections, or ensure all 3-Phase field wires are connected.
Remote	3-Phase Wire Reversed or Open Phase	On	On	On	Flash	On	Flip any two of the 3-phase field wire connections, or ensure all 3-Phase field wires are connected.

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