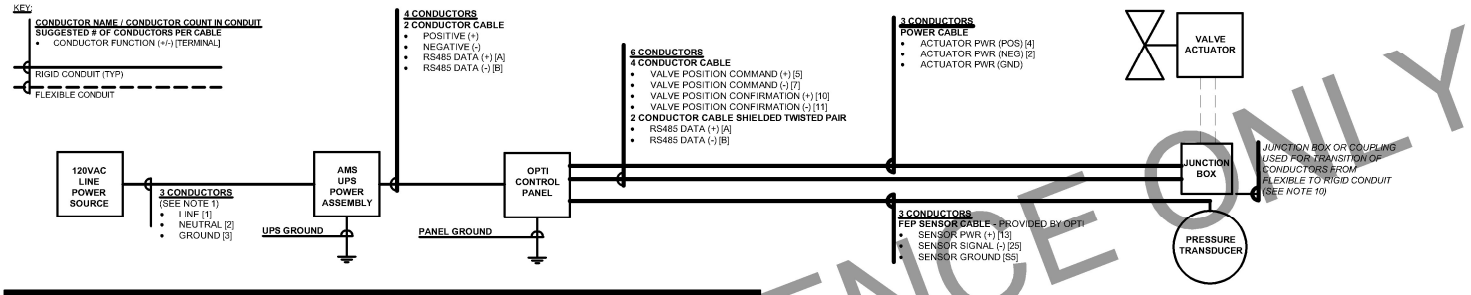

24VDC WIRING GUIDE - V 3.0.0				
CONTROL PANEL TERMINAL	EXTERNAL DEVICE TERMINAL	WIRE COLOR/CABLE LOCATION	PURPOSE	PROCURED BY
UPS POWER CONNECTION - AMS 24-108-UPS				
+	L+	UPS - DC TERMINAL BLOCKS	UPS LOAD CIRCUIT, POSITIVE	INSTALLER
-	L-	UPS - DC TERMINAL BLOCKS	UPS LOAD CIRCUIT, NEGATIVE	INSTALLER
A+	DATA + [TM-P8]	2 CONDUCTOR CABLE, TWISTED PAIR	UPS DATA (+)	INSTALLER
B-	DATA - [TM-P8]	2 CONDUCTOR CABLE, TWISTED PAIR	UPS DATA (-)	INSTALLER
ACTUATOR - ROTORK IQT & IQD SERIES (IQT: 303M2000, IQD: 143M2000)				
4	1	3 CONDUCTOR CABLE	ACTUATOR POWER (+)	INSTALLER
2	2	3 CONDUCTOR CABLE	ACTUATOR POWER (-)	INSTALLER
GROUND LUG	GND SYMBOL	3 CONDUCTOR CABLE	ACTUATOR GROUND	INSTALLER
5	16	4 CONDUCTOR CABLE	VALVE POSITION COMMAND SIGNAL (+)	INSTALLER
7	17	4 CONDUCTOR CABLE	VALVE POSITION COMMAND SIGNAL (-)	INSTALLER
10	15	4 CONDUCTOR CABLE	VALVE POSITION CONFIRMATION SIGNAL (+)	INSTALLER
11	14	4 CONDUCTOR CABLE	VALVE POSITION CONFIRMATION SIGNAL (-)	INSTALLER
A +	27	2 CONDUCTOR CABLE, SHIELDED TWISTED PAIR	RS485 DATA (+)	INSTALLER
B -	28	2 CONDUCTOR CABLE, SHIELDED TWISTED PAIR	RS485 DATA (-)	INSTALLER
PRESSURE TRANSDUCER (4-20mA) - PMC VL2000 SERIES				
13	----------	RED (+), PMC	PRESSURE TRANSDUCER, POWER	OPTI
25	----------	BLACK (-), PMC	PRESSURE TRANSDUCER, SIGNAL	OPTI
S5	----------	GREEN (GND), PMC	PRESSURE TRANSDUCER, GROUNDING	OPTI

ACTUATOR POWER CABLE AWG SPECIFICATIONS	
ROTORK IQT500	
WIRE GAUGE	MAX. LENGTH (FT)
8	147
10	92
12	58
14	37
16	23
18	14

MINIMUM CONDUIT SIZE SPECIFICATIONS	
NO. CONDUCTORS	MIN. CONDUIT SIZE (IN)
2	½
3 - 6	¾
7 - 9	1
10 - 12	1-¼

ELECTRICAL INSTALLATION NOTES

1. DIAGRAM INSTRUCTIONS FOR CONNECTING LINE POWER TO UPS SYSTEM REFER TO UPS TERMINALS 1, 2, & 3. SEE AMERESCO "UPS : 24VDC" DIAGRAM FOR TERMINAL GUIDE WITHIN UPS PANEL.
2. CONTRACTOR TO DETERMINE IF THERE ARE UNDERGROUND UTILITIES IN THE WORK AREA PRIOR TO EXCAVATION BY CALLING DIG SAFE AT LEAST 48 HOURS PRIOR TO STARTING WORK. CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO UNDERGROUND UTILITIES CAUSED BY TRENCHING OR EXCAVATION.
3. INSTALLATION OF THE CONTROL PANEL AND ASSOCIATED COMPONENTS (E.G., CABLING, CONDUIT, SENSORS) SHALL BE PERFORMED BY A LICENSED ELECTRICIAN. ELECTRICIAN SHALL BE RESPONSIBLE FOR ENSURING THAT THE CONTROL PANEL AND ASSOCIATED COMPONENTS ARE PROPERLY CONNECTED TO THE LINE POWER SOURCE AND THAT CONDUIT AND CABLING IS SIZED AND INSTALLED PER THE NEC.
4. ALL CONDUCTORS SHALL BE IDENTIFIED AT EACH END (LABELED OR COLOR CODED) AND THE IDENTIFIED CONDUCTORS DOCUMENTED IN THE SITE LAYOUT MAP.
5. PENETRATIONS INTO CONTROL PANEL MUST BE IP68 RATED (NO WATER SHALL PENETRATE ANY SEALS). SUBSURFACE TERMINATIONS SHALL BE SEALED WITH POLYWATER CLOSED-CELL FOAM DUCT SEALANT (PROCURED THROUGH OPTI WITH CONTROL PANEL).
6. REFERENCE "ACTUATOR POWER CABLE AWG SPECIFICATIONS" TABLE FOR THE CORRECT CONDUCTOR GAUGE FOR ACTUATOR POWER CONNECTIONS. ALL OTHER CONDUCTORS MUST BE AT LEAST 16AWG.
7. ALL BURIED CONDUIT RUNS SHALL BE RIGID SCH 40 PVC CONDUIT. ALL EXPOSED CONDUIT SHALL BE RIGID SCH 40 PVC OR FLEXIBLE TYPE-UA PVC. BURIED RIGID SCHEDULE 40 CONDUIT SHALL BE INSTALLED WITH A MINIMUM COVER OF AT LEAST 18" IN ACCORDANCE WITH TABLE 300.5 OF THE NEC.
8. CONDUIT SHALL BE SIZED PER THE NEC TO HAVE AN ADEQUATE CROSS-SECTIONAL AREA FOR INSTALLED CABLES. REFERENCE OPTI PROVIDED TABLE FOR MINIMUM CONDUIT SIZE. ACTUATOR HAS ¾" PORTS FOR CONDUIT, USE REDUCING FITTING IF NEEDED.
9. LEAVE A MINIMUM OF 1 FOOT SPARE CABLING NEATLY COILED IN CONTROL PANEL FOR FUTURE MAINTENANCE OR SYSTEM MODIFICATIONS.
10. LEAVE A MINIMUM 3 FEET LOOP OF FLEXIBLE CONDUIT IN OUTLET STRUCTURE FOR EASE OF FUTURE MAINTENANCE. FLEXIBLE CONDUIT SHALL RUN FROM ACTUATOR TO JUNCTION BOX LOCATED IN OUTLET STRUCTURE. RIGID CONDUIT SHALL RUN FROM JUNCTION BOX TO OPTI CONTROL PANEL.
11. ALL SUBMERGED/SATURATED METAL HARDWARE SHALL BE STAINLESS STEEL. GALVANIZED STEEL MAY BE USED ABOVEGROUND OR IN DRY LOCATIONS.
12. PRESSURE REFERENCE DEVICE (COMPONENT OF LEVEL SENSOR AT CABLE TERMINATION) TO BE LOCATED IN OPTI CONTROL PANEL.
13. CONNECT ALL EQUIPMENT GROUNDING CONDUCTORS TO THE OPTI CONTROL PANEL GROUNDING LUGS. GROUND THE OPTI CONTROL PANEL TO A GROUNDING ROD, GALVANIZED STEEL POLE, OR A CONCRETE-ENCASED GROUNDING ELECTRODE.
14. AFTER INSTALLATION, COMPLETE CONTRACTOR INSTALLATION CHECKLIST PROVIDED BY OPTI AND PROVIDE PHOTOS OF ALL INSTALLED EQUIPMENT. SEND SIGNED CHECKLIST AND PHOTOS TO OPTI.
15. OPTI CONSTRUCTION VERIFICATION CHECKLIST SHALL BE COMPLETED PRIOR TO ENERGIZING THE SYSTEM. FINAL COMPLETION SHALL BE REACHED WHEN: (1) CONSTRUCTION OF THE SYSTEM PER THE PLANS IS COMPLETE; (2) THE ENGINEER OF RECORD HAS COMPLETED FINAL INSPECTION OF WORK AND ALL NOTED DEFICIENCIES HAVE BEEN CORRECTED TO THE SATISFACTION OF THE ENGINEER OF RECORD, OPTI, AND THE SITE OWNER; AND (3) AN AS-BUILT SKETCH HAS BEEN PROVIDED OF ALL INSTALLED COMPONENTS IF FINAL INSTALL LOCATIONS HAVE VARIED FROM PLANSET.
16. LEVEL SENSOR CABLE SHALL NOT BE SPLICED

FOR REFERENCE ONLY

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WIRING PLAN 6IN-12IN IQT500 (V3 LINE POWERED)

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