Herculine® 10260S Smart Actuator

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Specification

Overview

Honeywell's HercuLine® 10260S

Smart actuators incorporate all of the high quality and reliable features of the traditional HercuLine® actuators plus the added benefits of a microprocessorbased enhanced electronics unit (EEU). These additional benefits provide:

- Faster set-up and commissioning
- Network capability
- Health parameter monitoring for proactive maintenance planning.

HercuLine 10260S Smart actuators enable operation at maximum process efficiency, minimal downtime, and access to all actuator parameters for real-time business decisions.

Honeywell's 10260S actuators are industrial rated and engineered for very precise positioning of dampers and valves. The HercuLine 10260S performs especially well in extremely demanding environments requiring continuous duty, high reliability, and low maintenance. Typical applications are furnace pressure dampers, gas/air valves, windbox dampers, coal mill dampers, and more.



Figure 1 Herculine 10260S Smart Actuator

The worm/worm gear combination also functions as an anti-backdrive mechanism, capable of holding two times the rated output torque in a backdriving condition.

Features

Performance —

- Accurate Positioning –
 Motor/gear train provides accurate positioning with almost instantaneous start/stop characteristics.
- Non-Contact Position Sensing Non-contacting sensing lowers maintenance costs and improves performance.
- Duty Cycle Continuous duty cycle motor. No burn out.
- Full Travel Speed Full stroke travel speeds from 10 to 60 seconds (90 degree travel, 60 Hz supply).

- **Torque** High torque capability in small package (10 to 300 lb-ft).
- **High Accuracy** Typically 0.25% of 90° span.
- High repeatability Typically0.2% of 90° span
- Characterization Linear, square root, or user configured 21-point characterization allows tailoring of control for specific applications.
- Input Filter setting Four programmable combinations of input filter settings are provided to accommodate various customers' needs. The combinations are none, spike, low pass, or spike + low pass filter.
- Deadband Deadband is programmable between the values of 0.2% to 5% of 90° span.

Actuator Operation

Microprocessor-based electronics continually monitor the performance, health, and position of the actuator for repeatable positioning and response to demand signal. When instructed to move, the enhanced electronics unit fires the appropriate triac on the motor drive circuit to position the motor. Actuator position sensing is via a noncontact position sensor that is continually monitored by the electronics.

Spur gears and a single reduction worm/worm gear combine with a synchronous AC induction motor for accurate and repeatable positioning of final control elements.

Features (continued)

Operation —

- Control Signals 0/4 to 20 mA, 0/1 to 5 Vdc, 0 to 10 Vdc, Digital remote setpoint (RS485 Modbus RTU protocol).
- Output Signals 0/4 to 20 mA, 0/1 to 5 Vdc and slidewire emulation.
- Power Requirements Low power consumption 120/240 Vac, 50/60 Hz, single phase ≤ 1 Amp.
- Manual Operation All 10260S series actuators are supplied with a manual hand wheel to operate the actuator when power is not available.
- Auto-Manual electric hand switch with auxiliary contacts indicating an "Out-of-Auto" position is available for local electric control.
- RS485/Modbus RTU
 Communication Simple and
 easy to use Modbus RTU
 communication is standard with all
 10260S actuators allowing
 seamless networking of Honeywell
 control products.
- HartTM Communication For Hart users, optional HART communications provides access to calibration, configuration, and maintenance data. In addition, the HART communications option is structured to work with the HART Asset Management Features.
- Auxiliary Outputs Two types of auxiliary outputs can be specified, SPDT switches or electromechanical relay outputs. Relay outputs can be programmed to output alarm conditions, provide control of other equipment, or indicate status.
- Alarm Functions Alarms may be assigned to relay outputs or may be accessed through Modbus. Alarms can be triggered from stall, temperature limits, motor cycle count, out of automatic mode, digital input, position, input failure, position sensor failure, power up failure, and more.

- Local HMI Configuration An integral keypad and high intensity display is available for nonintrusive local configuration of the actuator (Figure 2).
- Password protection is provided, allowing users to lock out some, all, or no groups of setup parameters to prevent tampering.
- Factory Calibration Factory calibration is stored in non-volatile memory and can be restored via the local HMI at any time.
- **Direction of rotation** Direction of rotation on increasing input signal is programmable.
- Split range operation Split range is programmable and infinitely adjustable.
- Digital Input Override A digital input is provided and is programmable to provide override of all other input signals as an emergency override of control. The digital input can be programmed to drive the actuator open, closed, remain in-place, or to a user specified position on contact closure.
- Failsafe When input signal exceeds high or low range limits (or input signal failure), the actuator can be programmed to drive open, closed, remain inplace, or drive to a user specified position.

Construction —

- Enclosure Rugged, industrial grade enclosure.
- Low Maintenance Simpleproven design means high reliability/low maintenance.
- Output Shaft Hardware All 10260S series actuators are supplied with an adjustable radius and adjustable position crank arm. Optional 12" crank arm, linkage kits, and direct coupling hardware are available.

- Limit Switches Two end-oftravel electric limit switches are supplied as standard equipment with all 10260S series actuators.
- Warranty Exceptional warranty
- Certification CSA, UL (Future)
 CE available.

Health Monitoring

A standard feature on all 10260S actuators accumulates information about actuator operation. The information then can be used to evaluate and determine predicted or scheduled maintenance periods. Parameters monitored are accumulated stall time, exceeded thermal operating rating of the actuator, and number of motor starts in a region of travel, total travel and current actuator travel.

Non-Contact Position Sensing

Honeywell 10260S series actuators implement a variable inductance, noncontact position sensor mounted directly to the actuator output shaft providing precision position sensing from 0 to 90 degrees, (Figure 3). This technology eliminates maintenance items such as wipers, bearings, as well as static friction, hysteresis and electrical noise over a wide range of demanding environmental conditions.

Slidewire Emulation

The Slidewire Emulation Circuit (SEC) emulates the proportional voltage output of a typical slidewire through a high impedance circuit. The voltage output is proportional to the supply voltage and shaft position. A noncontact position sensor is used to determine shaft position in place of the slidewire.

Local Display and Keypad

Configuration and set-up is through the local HMI, consisting of a display and keypad interface (Figure 2). A high intensity 10-character LED display and simple push buttons provide quick access for actuator set up and status information. If relay outputs are specified, all configuration can be done through either the local HMI interface or the PC configurator. If mechanical switches are specified, then the user must manually set the auxiliary output.

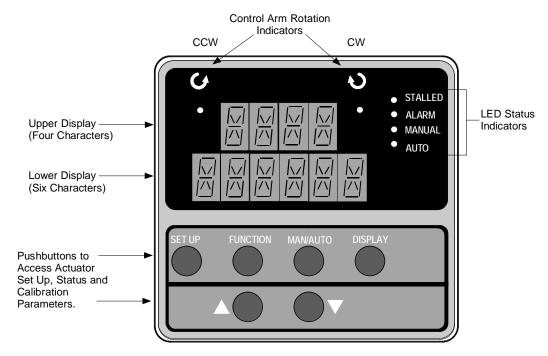


Figure 2 Local HMI (Display and Keypad)

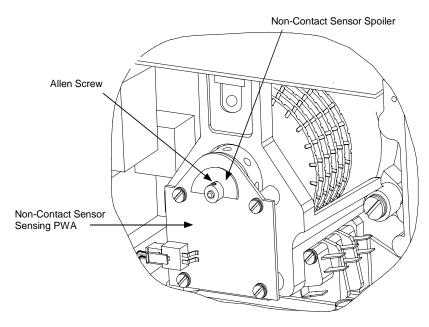


Figure 3 Non-Contact Sensor Assembly

Set Up/Configuration Parameters

Configuration parameters are logically grouped and accessed using the local HMI. Actuator calibration is also accomplished through a simple procedure using the keypad. By pressing the SETUP button on the HMI, you can step through the set up groups that contain all of the configuration parameters. The table below summarizes the configuration parameters available within the various set up groups. Full details of all configuration parameters are found in the 10260S Series Smart Actuator Installation, Operation and Maintenance Manual, document number 62-86-25-08

Set Up Group	Configuration Parameter Selections/Settings			
SET INPUT — Selects various parameters that define actuator operation.	IN TYP – Input Actuation Type INP HI – Input High Range Value INP LO – Input Low Range Value FILTYP – Input Filter Type LPFILT – Low Pass Filter Time Constant Direct – Actuator Rotation	Dband – Input Deadband FsTYP – Failsafe Type FsVAL – Failsafe Value CHAR – Input Characterization LDCAL – Restore Calibration Type		
SET RELAY— When the actuator is equipped with optional relays, this set up group allows you to set relay action for various actuator operating conditions. Contact closure can be wired to external annunciators or alarm points to indicate conditions for any of the Relay Types.	RTYPnn – Relay Type Input Range Position Range Deviation Upper or Lower Limit Travel Temperature High or Low Cycle Count Motor Stalled Manual Mode Power Up Test Failure Input Signal Failure Position Sensor Signal Failure	RnnE – Relay Count Multiplier RnnVAL – Relay Value Rnn HL – Relay High/Low RLYnHY – Relay Hysteresis		
SET CUROUT — Selects the current (or voltage) output range of the actuator.	CUROUT - Output Signal Range 4 – 20 mA 0 – 20 mA 1 – 5V 0 – 5V SW E			
SET COMM— Actuator can be defined as a master or slave device on a Modbus RTU RS-485 loop. Operating setpoint can be transmitted to the actuator and operating status can be read when connected to supervisory control systems.	COMM – Communications Parameters ADDRES – Device Address BAUD – Baud Rate XmtDLY – Response Delay DBLBYT – Floating Point Data Format			
SET DIGINP— Selects digital input action upon contact closure.	DIGINP – Digital Input State Endpos – End Position Value			
SET DISPLA— Selects desired decimal places and engineering units for local display.	DECMAL – Decimal Point Location EUNITS – Units Display UNITS – Display Units			
CAL INPUT, MTR, CURENT— If needed, calibration of the actuator input, motor position and actuator output can be performed using the local keypad and display.				

Set Up Group	Configuration Parame	eter Selections/Settings
SET LOCK— Enables lock out or access to selected set up group parameters and calibration values.	LOCKID – Set Security Password LOCK – Lock Out	
READ STATUS— Displays failsafe condition and the results of various diagnostics performed during power up.	FAILSF – Failsafe RAMTST – RAM Test Diagnostic SEETST – Serial EEPROM Test Diagnostic	CFGTST – Configuration Test Diagnostic CALTST – Calibration Test Diagnostic
SET DRVINF— Allows access to actuator device information.	VERSON – Firmware Version SPEED – Stroke Speed POWER – Power Input Voltage and Line Frequency TAG – Tag Name	MFGDAT – Manufacturing Date LREP – Date of Last Repair LCAL – Date of Last Field Calibration REPTYP – Repair Type
SET MAINT— Allows access to parameters that monitor operating conditions.	TEMP – Actuator Temperature TEMPHI – High Temperature Limit TEMPLO – Low Temperature Limit ACSTAL – Accumulated Stall Time STARTS – Accumulated Motor Starts	RLnCNTS – Relay Cycle Counts REGNn – Accumulated Motor Starts (Regions of Motor Travel) TOTDEG – Total Degrees of Motor Travel MANRST – Reset Maintenance Statistics

Specifications – General

Physical	
Weight	45 lb. (20.4 kg) net
Enclosure	Precision-machined Aluminum alloy casting, finished in light gray powder coat epoxy.
Gear Train	Alloy steel, high efficiency steel spur gear primary train. Precision ground, self locking/self releasing worm gear final mesh.
Mechanical Stops	To prevent over-travel.
Operating Temperature	-30 °C to +75 °C (-20 °F to +170 °F)
Storage Temperature	-40 °C to +93 °C (-40 °C to +200 °F)
Relative Humidity	0 to 99 % R.H. non-condensing over the full operating temperature range.
Scale	0 % to 100 % corresponding to full crank arm travel.
Crank Arm	Adjustable radii (1-7/16" to a maximum of 5"). Position adjustable through 360° rotation. Optional 12" crank arm adjustable 0 to 12" radii.
Output Shaft	1" diameter, 1-1/2" long is standard on 10261S, 10262S, 10264S, 10266S, 10267S, 10268S. 1" diameter, 2" long is standard on 10263S, 10265S and 10269S optional on other models.
Rotation	90° degrees between 0 % and 100 % on scale, limited by mechanical stops.
Direction of Rotation	Field selectable via HMI.
Manual Handwheel	Provides a means of positioning the actuator in the event of a power failure or set-up.
Lubrication	Texaco Starplex 2 EP Grease

Specifications - General, Continued

Electrical					
Output Torque/Full Travel Stroking Time	Model #	Torque Lb-ft	N-M	Output Sha @60Hz	ft Speed sec/90° @50Hz
	10261S 10262S 10264S 10266S 10267S 10268S 10269S 10263S 10265S	10 20 40 60 40 80 150 200 300	15 27 55 80 55 110 200 270 400	10 20 40 60 20 40 60 40	12 24 48 72 24 48 72 48 72
Mains Supply	• .	120 Vac single phase, 50 or 60 Hz 240 Vac single phase, 50 or 60 Hz			
Motor		Instant start/stop, non-coasting, non-burnout, continuous duty, permanent magnet, synchronous induction motor. Can be stalled up to 100 hours without damage.			
Motor Current	= No load = full load = locke	ed rotor			
	Model No. 10261S, 62S, 64S, 66S 10263S, 10265S 10267S, 68S, 69S	0.4 A 1.0 A	/, 50/60 Hz (48 VA) (120 VA) (96 VA)	0.3 A (120 VA)
Fuses (Motor drive)	Wickmann USA #373-1160	<i>-0-41:</i> 1.6	Amp Fast (2)		
Loss of Power	Stays in place.				
Local Auto/Manual Switch	Optional – Allows local and	automatic o	peration of the act	tuator.	
Limit Switches	Standard – Two SPDT end	of travel limi	ts.		
Auxiliary Switches/Relays	Optional – Up to 4 additional relay outputs, programmable		ches rated (10 A a	at 125 Vac, 5 A a	t 250 Vac) or 4

Certifications	
Approvals	CE Compliance (Optional)
	CSA/UL
	NEMA 4

Torque Settings of Crank Arm Bolts		
Clamp Bolt	Standard Arm (Part Number 087449) (1-7/16 to 5 in. adjustment): 85 lb-ft. Optional Long Arm (Part Number 154007) (0 to 12 in. adjustment): 85 lb-ft.	
Rod End Bolt	Standard and long arms: 30-35 lb./ft	

Specifications - Actuator

Electrical	Openioations Actua			
Input Signals	Analog: 0/4 to 20 mA			
input signais	(With supplied shunt resistor for current range: 250 ohms ±0.1 % Part Number: 070756)			
	0/1 to 5 Vdc	0/1 to 5 Vdc		
	0 to 10 Vdc			
	Digital: Remote Setpoint via Modbus RTU	(RS485)		
Input Impedance	Input	Input Impedance		
	0/4 to 20 mA	250 ohms		
	0/1 to 5 Vdc	10 K ohms		
Input Characterization	Provides characterization of the input signal. Selections are Linear, Square Root or Custo	m – Equal %, Quick Opening, User Defined.		
Sensitivity	0.2 % to 5 % of 90° span, proportional to dea	dband		
Hysteresis	Less than 0.4 % of full scale			
Deadband	0.2 % to 5 % of 90° span, adjustable. Shippe	ed at 0.5%		
Repeatability	0.2 % of 90° span			
Voltage/ Supply Stability	0.25 % of span with +10/-15 % voltage chang	ge		
Temperature Coefficient	Less than \pm 0.030 % of span per degree C for 0 °C to 50 °C			
	Less than ±0.05 % of span per degree C for –30 °C to 75 °C			
Zero Suppression	90% of span.			
Input Filters	Selectable spike and low pass filters.			
Solid State Motor Control	Two triac switches for clockwise or counterclockwise motor operation.			
Failsafe operation	If input signal exceeds configured input range	e. Selectable and adjustable.		
Feedback signals	0 to 20 mA, 4 to 20 mA			
	1 to 5 Vdc with 250 ohm resistor, (0 to 16 Vdc	with 800 ohm resistor)		
Slidewire Emulation	Provides output voltage ratiometric to shaft position and potentiometric to supply voltage (1 to 18 Vdc) without a slidewire. Emulates a 100 ohm to 1000 ohm slidewire. 10 mA output maximum.			
Isolation	Input signal, output signal and power are isola	ated from each other.		
Load Requirement (4-20)	Current Out — 0 to 1000 ohms			
Programmable Functions	Selectable and configurable operating parameters			
	Input range Deadbar	,		
	1	on loss of • Communication		
	Input characterization input sig Failsafe	nal parameters on loss of • Split range operation		
	nocition			
	T ● Digital induitaction	of rotation • Alarms		
		· , warmo		

Turnbuckle Linkage Kits (Table V, Option E)

These kits are to be used where short lengths are required. These lengths range from 12 inches to 24 inches and refer to the rod end center-to-center distance. All turnbuckle kits include the turnbuckle, load rod end (left-hand thread), connecting rods and locking nuts. The nut and bolt to connect the rod end to the load are supplied by the Customer. The actuator rod end (right-hand thread), nut and bolt are supplied with the actuator.

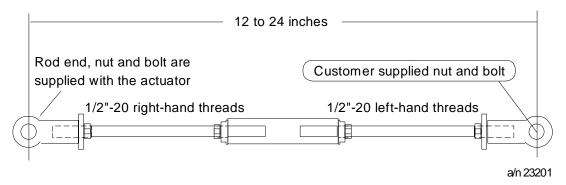
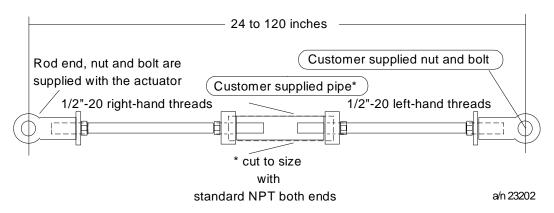


Figure 4 Turnbuckle Linkage Kit

Pipe Linkage Kits (Table V, Option E)

These kits are used for linkage lengths from 24 to 120 inches. All pipe linkage kits include the mechanical pipe couplings, load rod end (left-hand thread), connecting rods and locking nuts. The Customer must supply a piece of schedule 40 pipe* (Both ends with right-hand NP threads) and a nut and bolt to connect the rod end to the load. The actuator rod end (right-hand thread), nut and bolt are supplied with the actuator.



*Pipe length = Overall linkage length minus (-) 17 inches

Figure 5 Pipe Linkage Kit

Actuator Crank Arms

The 10260S Series Actuator comes standard with a 5-inch crank arm (Figure 6) and there is an optional 12-inch crank arm that is adjustable from 0 to 12 inches. The crank arm uses a standard ½" rod end to compliment the turnbuckle and pipe linkage kits.

For applications that use a link rod, a link rod adapter is available as an option in the Model Selection Guide.

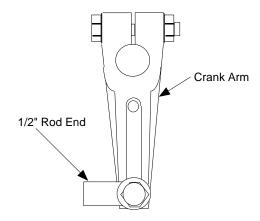


Figure 6 Standard 5" Crank Arm

Projecting Scale Option (Table V, Option B)

The projecting scale option is available for customers whose actuators are direct coupled or positioned such that it would be impossible to read the standard scale on the actuator. The projecting scale is attached to the actuator and is readable from a distance from the front side of the actuator as well as the normal shaft side of the actuator.

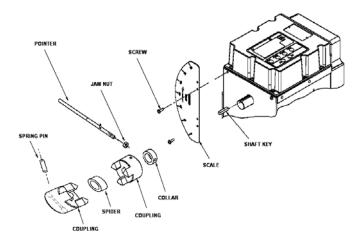


Figure 7 Projecting Scale Option Exploded View

Instructions

- · Select the desired key number. The arrow to the right marks the selection available.
- Make the desired selections from Tables I thru VIII using the column below the arrow.
 A dot (•) denotes unrestricted availability.

Key Number	1	II	III	IV	V	VI	VII	VIII
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KEY NUMBER - Torq	ue and Speed		Selection	Availa	abili
Output Torque	Full Travel Stroking -	Time in Seconds			Ī
(lb ft.) (N - M)	60 Hz	50 Hz			
10 (15)	10	12	10261S	₩	Ī
20 (27)	20	24	10262S	₩	
40 (55)	40	48	10264S	₩	
60 (80)	60	72	10266S	₩	
40 (55)	20	24	10267S	₩	
80 (110)	40	48	10268S	₩	
150 (200)	60	72	10269S	₩	
200 (270)	40	48	10263S	₩	
300 (400)	60	72	10265S	₩	

TABLE I - POWER SUPPLY - SINGLE PHASE

120 VAC 60 Hz	Single Phase 120 VAC 60Hz Motor	1	•
120 VAC 50 Hz	Single Phase 120 VAC 50Hz Motor	2	•
220/240 VAC 60 Hz	Single Phase 220/240 VAC 60Hz Motor	3	•
220/240 VAC 50 Hz	Single Phase 220/240 VAC 50Hz Motor	4	•

TABLE II - ANALOG INPUT/OUTPUT SIGNALS

Input	4-20 mA, 0-20mA (1-5 Vdc, 0-5 Vdc, 1-10 Vdc, 0-10 Vdc)	0	•
Output	No Analog Position Output	_ 00	•
	4-20 mA, 0-20mA (1-5 Vdc, 0-5 Vdc, 1-10 Vdc, 0-10 Vdc)	_ 20	•
	Slidewire Emulation	_40	•

TABLE III - SWITCH AND RELAY OUTPUTS (2 end-of-travel limit switches standard)

Auxiliary Switches	None	00 _	•
and	2 Auxiliary SPDT Switches	20 _	•
Relay Outputs	4 Auxiliary SPDT Switches	40 _	•
	2 Auxiliary + 2 Programmable Relay Outputs	22 _	•
	2 Programmable Relay Outputs	02 _	•
	4 Programmable Relay Outputs	04 _	•
Auto/Manual Switch	None	0	•
	One Auto/Manual Switch with Out-of-Auto Contact	1	•

TABLE IV - CONFIGURATION INTERFACE

Remote	(Note 1)	None - requires HercuLink ™	0	•
Local		Integrally mounted local display/keypad interface	1	•

TABLE V - COMMUNICATIONS/PROTOCOL

Modbus RTU RS485	RS-485 Modbus compliant - standard with EEU	0	•
HART 5	HART Communications Protocol	2	•
HART 6	HART Communications Protocol	3	•

TABLE VI - OPTIONS

Shafts	Standard	0	•
	5 Inch Extension	1	b
	3 Inch Extension		е
Projecting Scale	None	_0	•
	3/4 Inch Shaft Coupling	_1	С
	3/4 Inch Shaft Coupling, CCW to Open	_2	С
	1 Inch Shaft Coupling	_3	С
	1 Inch Shaft Coupling, CCW to Open	_4	С
	CW to Open, No Coupling	_5	d
	CCW to Open, No Coupling	_6	d
Crank Arm	5 Inch Standard	0	•
	None	1_	•
	12 Inch	2	•
Rod Adapter	None	0_	•
	3/8 Inch	1_	•
Linkage Kits	None	0	•
	12 to 16 Inch Turnbuckle Kit	1	•
	16 to 20 Inch Turnbuckle Kit	2	•
	20 to 24 Inch Turnbuckle Kit	3	•
	1 Inch Pipe Kit	4	•
	1.5 Inch Pipe Kit	5	•
	2 Inch Pipe Kit	6	•

TABLE VII- OPTIONS

Weatherproof	Weatherproof	0 •
	NEMA4/IP66	1 •
Approvals	None	_0_ •
	UL / CSA	_1_ •
	CE	_2_ •
Tagging	None	0 •
	Linen (Note 2)	1 •
	Stainless Steel (Note 2)	2

TABLE VIII - FACTORY OPTIONS

Special Manuals No Special Options (US Manual Standard)		0_	•
Other	None	_ 0	•
	Certificate of Conformance	_ 2	•

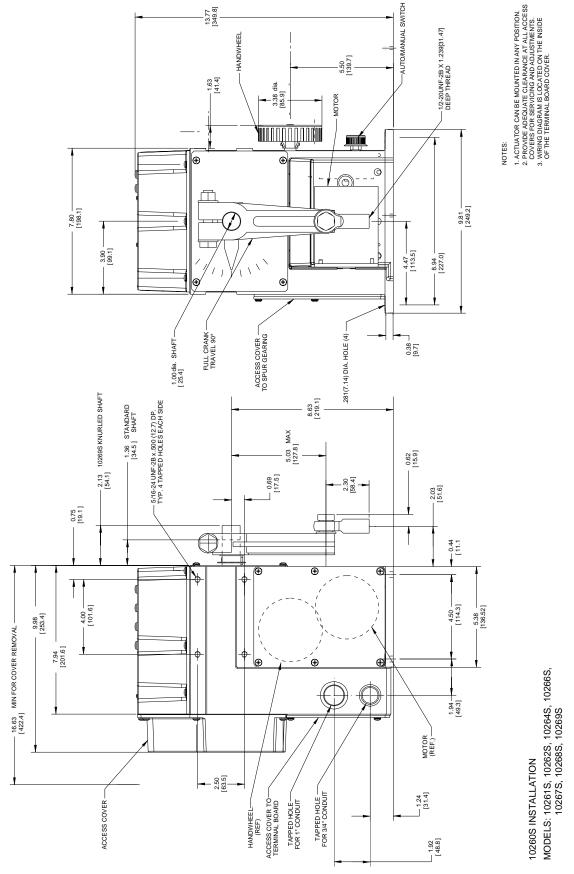
ACCESSORIES

ACCESSORIES			
	Description	Part Number	
Handheld Configuator	Handheld Configuator HercuLink [™] Palm Software		
(Note 3)	Battery powered 232/485 converter w/cable	51452354-510	
HART	Turk Cable for Handheld Connection	51452352-501	
Rod Adapters	5/8 Inch	083338	
	7/16 Inch	083336	
	7/8 Inch	083339	
Crank Arm	5 Inch Standard	51309967-501	
	12 Inch	51452160-501	

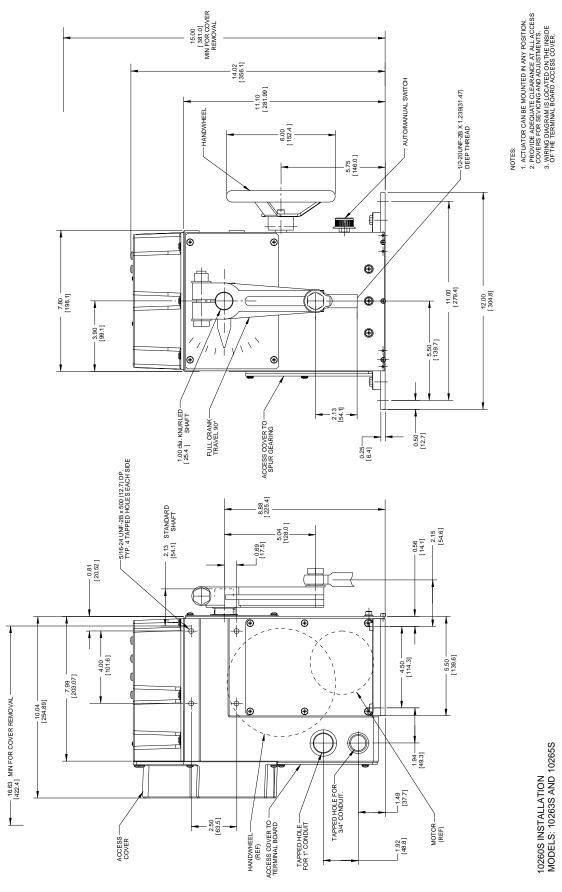
RESTRICTIONS

Restriction		Available Only With	Not Available With	
Letter	Table	Selection	Table	Selection
b	VI	X0XXX	Key Number	10263A, 10265A, 10269A
С	VI	0X100	Key Number	10263A, 10265A, 10269A
d	VI	050XX, 060XX, 051XX, 061XX	Key Number	10263A, 10265A, 10269A
е	VI	X0XXX	NA	NA

- Note 1: HercuLink[™] software (51452354-509), RS232/485 converter (51452354-510), customer supplied Palm[™] PDA running OS3.5 or higher and Palm serial cable are required if no display is selected.
- Note 2: Customer must supply tagging information Up to 3 lines, 22 characters per line.
- Note 3: Requires PDA manufacturer's serial interface cable.



Outline and Dimensions of 10261S, -62S, -64S, -66S, -67S -68S and -69S Actuators



Outline and Dimensions of 10263S and 10265S Actuators

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

For more information, contact Honeywell sales at (800) 343-0228.



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